



United Nations
Educational, Scientific and
Cultural Organization



Intergovernmental
Oceanographic
Commission



UNESCO – IOC – US DOC - NOAA
International Tsunami Information Center

**STRENGTHENING TSUNAMI WARNING
AND EMERGENCY RESPONSE**

11-15 February, San Salvador, El Salvador

10 Steps to Enable a Successful Tsunami Emergency Response

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1. Know and understand the hazards of tsunami and a country's tsunami risk.

□ Historical:

- Paleo-tsunami (~M9.0 earthquake recurrence interval could be 100s – 1000 yrs)
- Local Tradition (oral, indigenous knowledge)
- Written records from recent events

□ Scientific understanding of contributing factors:

- Near-shore Bathymetry (critical for modelling)
- Locations of likely events

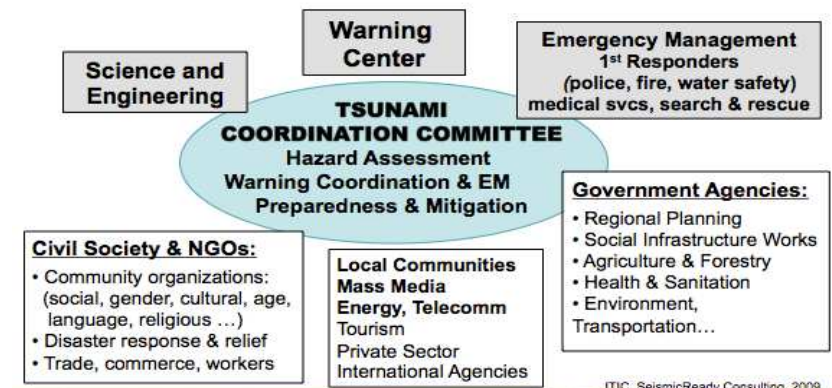
- ***RISK is: “The probability of harmful consequences or expected losses resulting from interactions between natural and/or human induced hazards and vulnerable conditions.”***

2. Develop an "end to end" Tsunami Early Warning and Mitigation System (TEWS) implementation strategy. Identify lead agencies at all levels of government.

- ❑ Must cover activity chain from Event Detection to Warning/Evacuation at the beach
e.g., Early Warning Systems: A Checklist (ISDR, 2006)

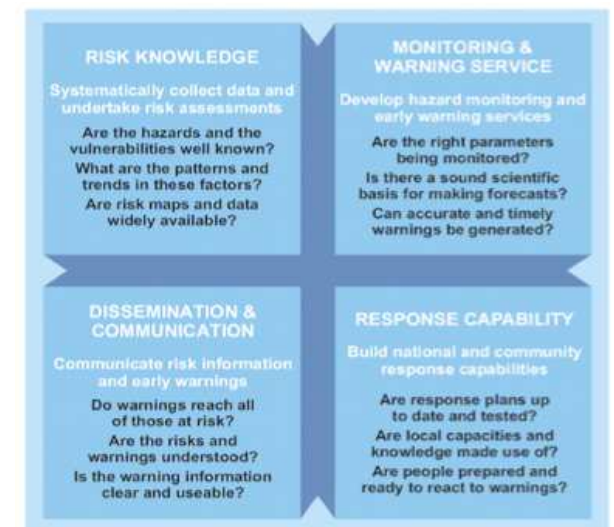
- ❑ Remember to include:

- **Government**
- **Utilities**
- **NGO's**
- **Business**



3. Set up stakeholder (multi-hazard and/or tsunami specific) coordination committees at all levels of government.

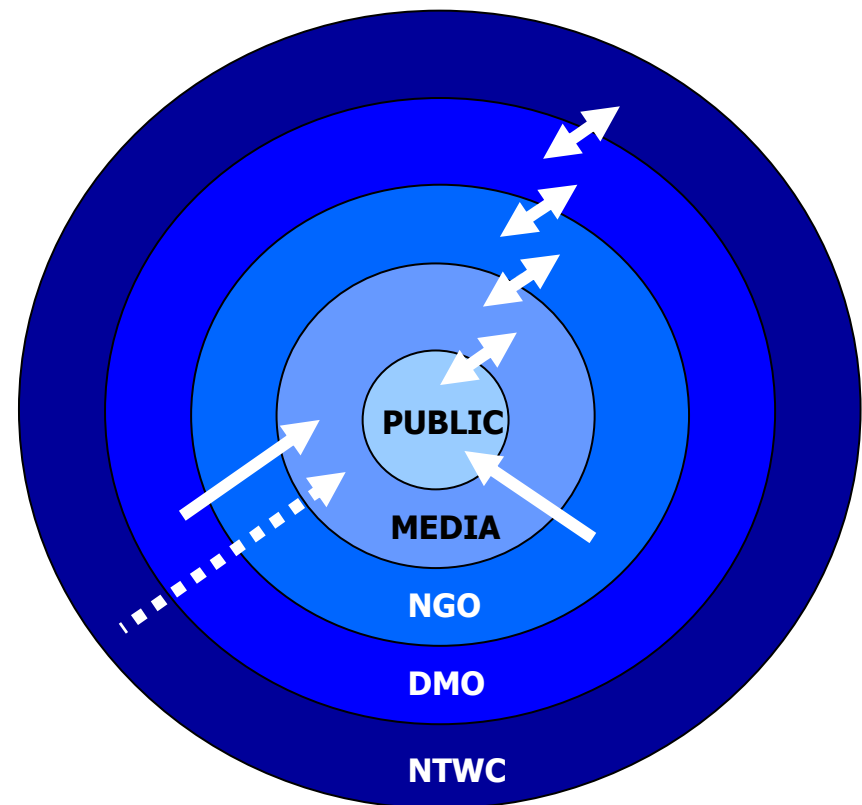
- ❑ Identify lead agencies at all levels of Government, Utilities, NGO's, and Business
- ❑ “People centered” warning system is to empower individuals with knowledge to act in time with appropriate action
- ❑ Includes:
Tsunami Risk Knowledge,
Monitoring and Warning,
Communication Dissemination,
Response Capability



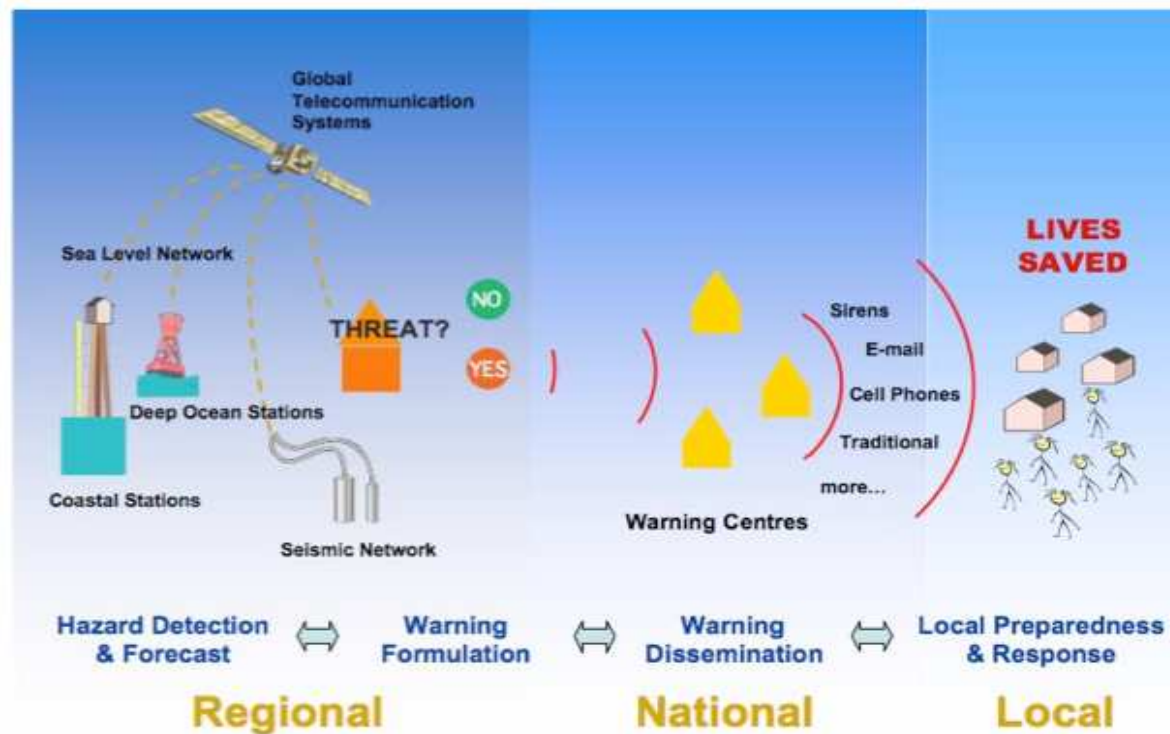
Four Elements of People-centred Early Warning Systems

4. Develop multi-hazard disaster response plans including tsunami-specific emergency response plans, SOPs and checklist at national, provincial, city, and local levels.

Integrate emergency policies and mobilize all government agencies, in coordination with NGOs and the private sector.

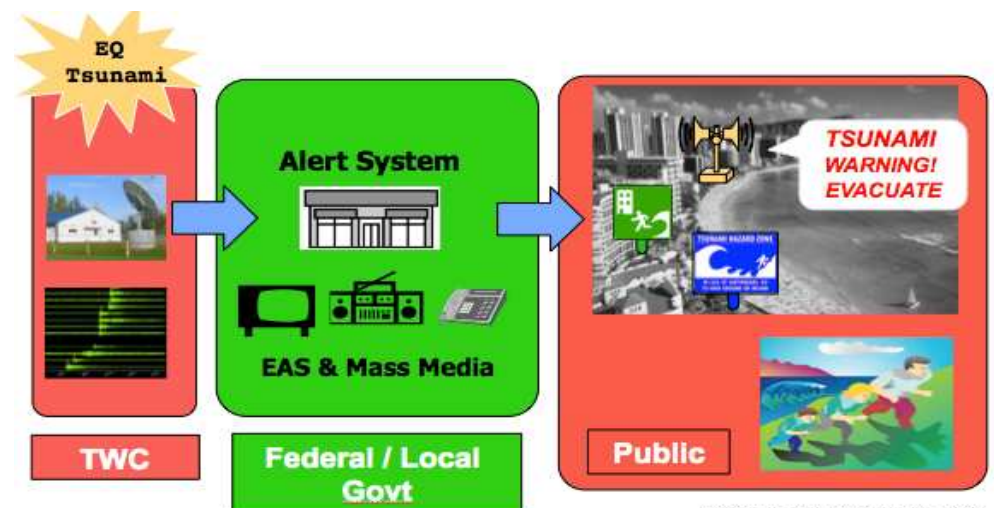


5. Enable a country to receive 24x7 Tsunami Warning Center messages through international/regional and/or national tsunami warning systems developed via the UNESCO - IOC/ICG coordination process for international alerts.



6. Develop a rapid 24 x 7 communications dissemination infrastructure "down to the last kilometer." Involve and partner with the mass media for alert dissemination, building preparedness, and increasing awareness.

- ❑ Media must be involved in the planning and training phase to build a “team” relationship
- ❑ Different levels of government have different levels of media access



7. Emphasize sustainable local community education, preparedness, and mitigation programs (i.e. tsunami evacuation maps, routes, signage, sirens)

- ❑ Community meetings
- ❑ School visits
- ❑ Involvement in exercises



(左写真)
作業の注意事項の
説明



(上写真)
ワークショップで作
成された避難地図

(左写真)
ワークショップでの
作業状況

8. Conduct annual tsunami exercises and drills at various levels of government, and in particular, with coastal schools.

- ❑ Start with easy, build in complexity
Crawl, walk, run...
- ❑ Organizational, Drill, Table Top, Functional, and Full Scale



9. Obtain commitment from public authorities to enact multi-hazard and/or tsunami specific disaster risk reduction policies at all levels of government.

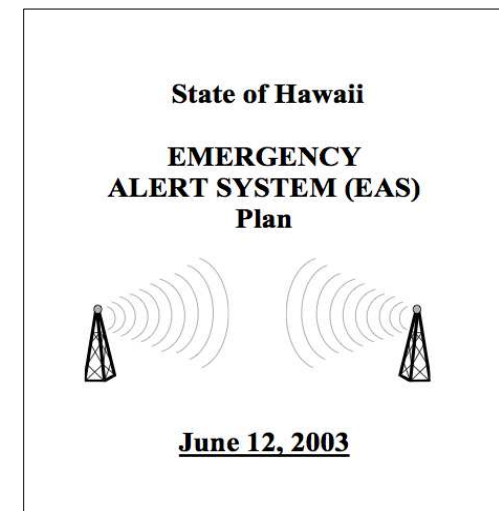
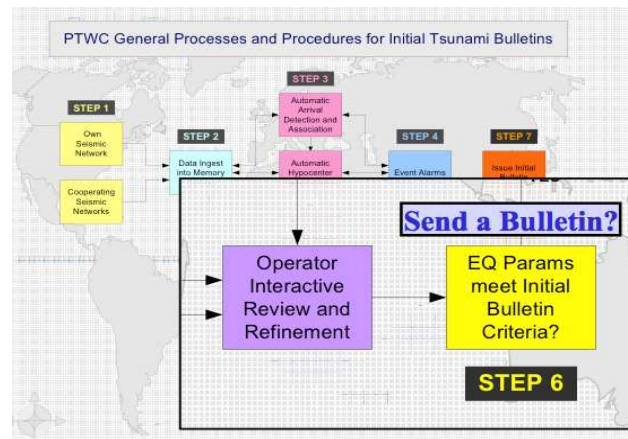
- ❑ Land usage
- ❑ Key infrastructure
- ❑ Risk assessments for major events



Honolulu Star-Bulletin, 1960

10. Develop emergency management policies and legislation that address multi-hazards including tsunami specific events.

- ❑ Public law
- ❑ Agency regulatory rule making authority
- ❑ Emergency Operations Plans (EOP's)
- ❑ Standard Operating Procedures (SOP's)
- ❑ Checklists





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Thank You

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