

# Early warning and mitigation: Reducing disaster risk

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# Agenda

- Risk reduction, not elimination of risk
  - Lives
  - Property
  - Livelihoods
- Hazards most amenable to risk reduction through ICT-based early warning
- Examples of what we can do in
  - Early warning
  - Mitigation

# Sri Lanka's biggest natural disasters compared

	Families affected in Sri Lanka	Deaths
1978 East Coast Cyclone & Tidal Surges	250,000	915
2004 Indian Ocean Tsunami	248,266	30,974 (40,000)
	<b>1:1</b>	<b>1:34</b>

# Why?

- Early warning reduced deaths in 1978; no early warning in 2004: ~1 in 600 Sri Lankans died
- Damage to property and livelihoods may not have been significantly different in the East Coast

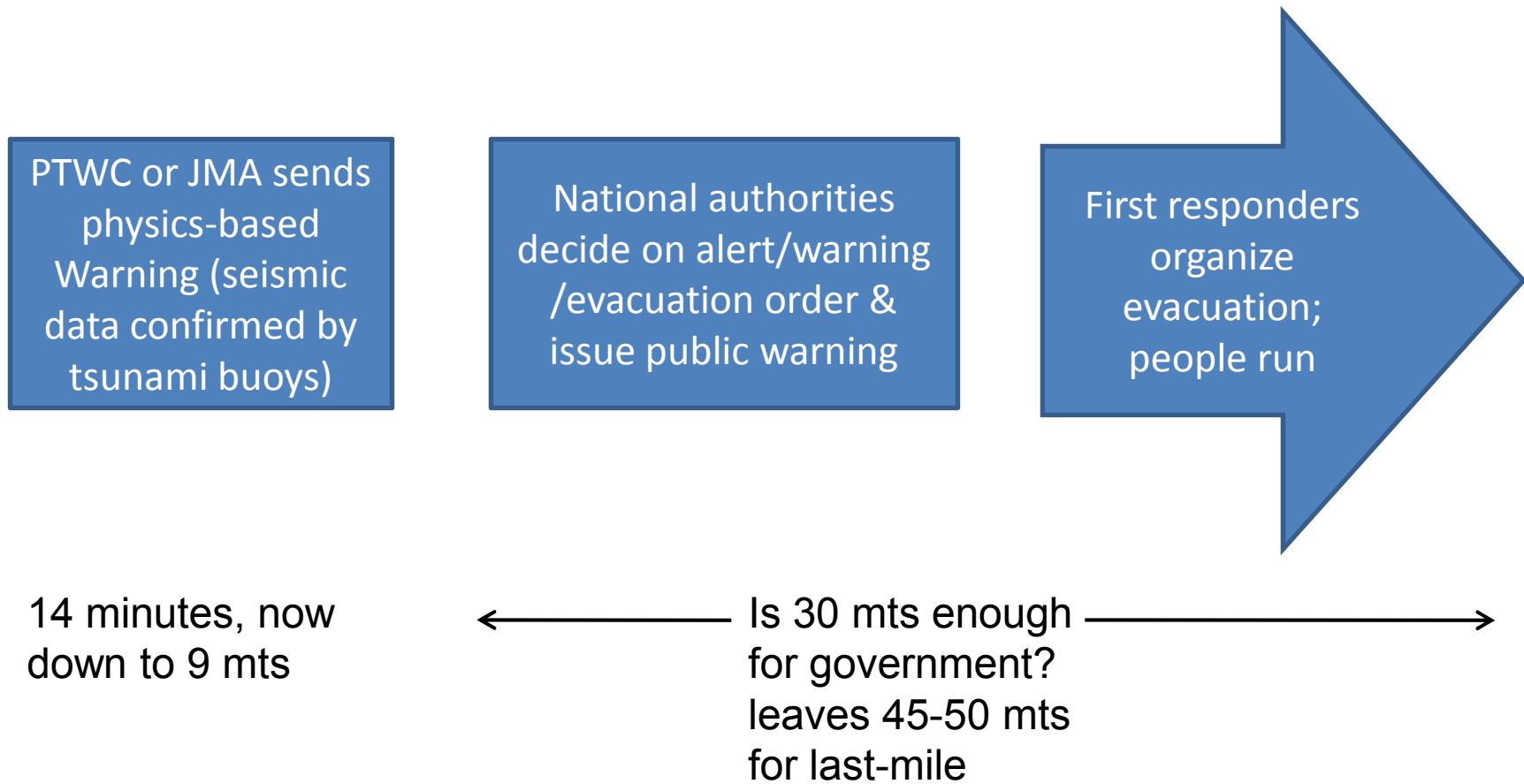
# For which hazards will early warning be most effective?

	Warning time less than 60 mts	Warning time more than 60 mts but less than 4 days	Warning time more than 4 days
<b>Large geographical scope</b>	E.g., earthquake	E.g., cyclone/storm, teletsunami, breach of an upriver dam in a large cascaded system	E.g., drought
<b>Local geographical scope</b>	E.g., local tsunami, landslide triggered by floods, single small dam failure	E.g., volcanic eruption, certain forms of floods	E.g., some forms of landslides

# The hardest case

- Thankfully we are not subject to local tsunamis
- Teletsunamis originating in Sunda Trench
  - Slim possibility of a fault line south of Sri Lanka that could generate teletsunamis

# Teletsunamis: Making the most of 90 minutes



# Sri Lanka's mobile networks ready to carry cell broadcasts

- Why is DMC still talking in terms of SMS?
  - SMS is point-to-point; CB is point-to-multipoint
    - SMS is okay for sequential transmission of new year messages from President
    - CB is better when every second counts
- Can the DMC and Met Department commit to getting alert/warning/evacuation order out in 30 mts from time of receipt of JMA/PTWC message?
  - Messages now faster and better



# Part of JMA notice 4 mts after the Great Tohoku Earthquake of 11 March 2011

Tsunami Forecast Region	Estimated Tsunami Arrival Time	Estimated Tsunami Height
IWATE PREF.	(*1)	3m
MIYAGI PREF.	15:00 JST 11 Mar	6m
FUKUSHIMA PREF.	15:10 JST 11 Mar	3m

Source: [http://www.jma.go.jp/en/tsunami/focus\\_04\\_20110311145000.html](http://www.jma.go.jp/en/tsunami/focus_04_20110311145000.html)

Footnote said local tsunami would have made contact in Iwate by 14:50 JST when warning was issued

# The cruel paradox

- The more lives we save, the more people without livelihoods we are likely to have
- How can risks to livelihoods be reduced?
  - Tsunamis are highly destructive
- Must be able to restore, if not save, property

# Payagala North Railway Station, January 2005



# Land-use planning, resilient buildings, & mandatory insurance

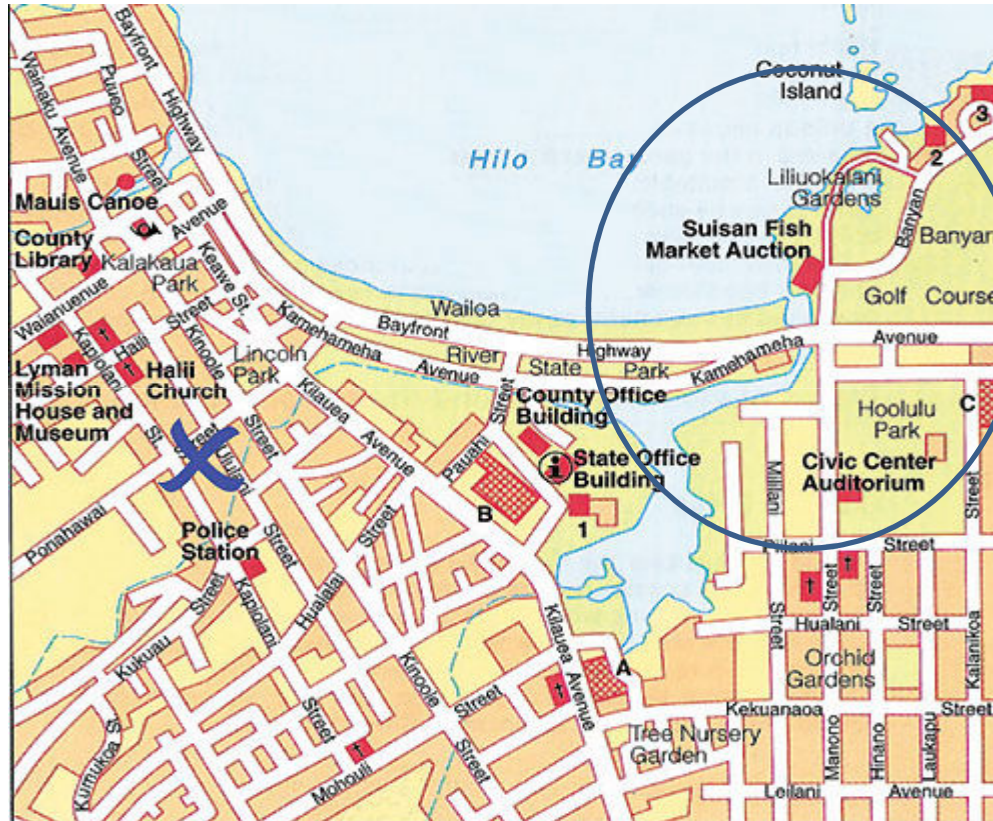
- Not withdrawal from sea coasts, but
  - Land-use planning and building codes coupled with mandatory insurance
  - High-risk areas will come with high insurance premia
  - Insurance providers will also enforce building codes

# Government's roles

- Publish inundation maps, based on massive amount of data collected after 2004 tsunami
  - Use most vulnerable areas for playgrounds and such



# Focal point of tsunami damage in former tsunami capital, Hilo, Hawai'i



Area of maximum tsunami impact

# Then, 1960





Now





# Government's roles: Building codes

- In consultation with professionals and construction industry, define building codes
  - Lessons from Bawa architecture
    - Concrete
    - Open ground floor areas
    - Pillars supporting upper floors allowing for vertical evacuation

# Tsunami survivor (except the French windows on the right)



# Mandatory standards for hotels

- Hotels concentrate strangers; need additional care
  - Critically important for new hotels coming up in East Coast
- Standards essential
  - Training, contingency planning, 24/7 helpdesk
  - Annual certification as “disaster ready”