Maritime Sector Strategies to Augment Tsunami Monitoring with Economic, Safety and Environmental Co-benefits

ESBN Taskforce on Disaster and Climate Risk Reduction

Eric Roeder
Economic Affairs Officer & ESCAP Sustainable Business Network (ESBN) Focal point on Disaster and Climate Risk Reduction
ICT and Disaster Risk Reduction Division
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Organised by ESBN Taskforce on Disaster and Climate Risk Reduction

in collaboration with

UN ESCAP Divisions
- ICT and Disaster Risk Reduction Division (Lead)
- Transport Division (Maritime focal point)
- Trade, Investment and Innovation Division (Sustainable Business and Investment Section)
Are tsunamis rare occurrences?

- Tsunamis are deemed rare events, yet:

"Over the past two decades, tsunamis have accounted for almost 10 per cent of economic losses from disasters, setting back development gains, especially in countries that border the Indian and Pacific Oceans."

— UN Secretary-General, António Guterres
Why augment tsunami monitoring?
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• Reinforce the need for robust, reliable tsunami warning systems (Build Redundancy).
Why augment tsunami monitoring?

- Current systems are expensive to build and maintain, so only a limited number are deployed.

- Gaps in the coverage of the network, as well as routine outages of instruments, limit the ability of current detection systems to accurately assess the risk and impact posed by each event.
Why augment tsunami monitoring?

- Lifespan of tsunami monitoring systems before replacement
- Lifespan of seabed monitors are 1 to 2 years
- In-water life of a tsunami detection buoy: 2 to 4 years
Vandalism of ocean observing platforms takes many forms. Surface buoys act as fish aggregation devices, attracting fishing operations to the vicinity of the buoy.

- Vessel impact
- Malicious damage
- Theft
- Detach from moorings

A confluence of all these factors can mean that a country’s tsunami early warning system is completely in-operational.
Strategies to augment tsunami monitoring (1)

SMART Cables

- New telecommunication cable systems equipped with sensors could be established providing decadal real-time data for ocean climate monitoring and disaster mitigation (particularly from tsunamis). This initiative is an on-going part of the Joint Task Force under IOC-UNESCO and explored by other private sector programmes.
Strategies to augment tsunami monitoring (2)

Shipping

- Container ships and other commercial vessels can act as “passive” markers for vertical sea-surface motions, and precise Global Navigation Satellite Systems (GNSS) positions from these ships can be used to detect tsunamis. High-accuracy GPS and satellite communications can serve to create a dense, low-cost tsunami sensing network that would improve detection and predictions of tsunamis.
Strategies to augment tsunami monitoring (3)

Stationary Maritime Infrastructure

- If the platform is fixed/anchored, what needs to be measured is the sea-surface elevation with respect to the platform (taking into account possible platform subsidence): a radar (or laser) gauge mounted to the structure pinging the sea-surface can serve as an additional strategy for enhanced tsunami monitoring. These platforms also have their own private telecommunications cables that can host sensors.
Subsea fibre-optic telecommunications networks, commercial shipping lines, other commercial vessels that traverse the waters along with fixed maritime infrastructure could provide more extensive coverage of tsunamigenic locations around the ESCAP region.

These strategies compliment each other, augment current tsunami monitoring, and can lead to more rapid and accurate predictions — to cost-effectively fill gaps and build redundancy!
What is the role of business?

• Leverage expertise and strengths;
• Enhance early warning; and
• Have maritime infrastructure host tsunami sensors.

The ESBN Task force on Disaster and Climate Risk Reduction promotes the effective participation of business in disaster and climate risk reduction (DCRR).
What are the co-benefits for the Maritime Sector?

- **Economic benefits:** E-navigation, reducing the infrastructure costs for ports, offshore surveying, monitoring subsidence in stationary infrastructure such as oil platforms, Increased cost-effectiveness of operations.

- **Safety benefits:** Reducing maritime accidents and groundings.

- **Environmental benefits:** Reducing the incidents and risks of oil spills, lowering environmental risk factors (which support SDG14). SMART cables as well can monitor ocean health and climate.
Thank you

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