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1.3 ICG/IOTWMS Capacity Assessment of Tsunami Preparedness in the Indian Ocean:

**Findings on
Downstream Tsunami Response Processes**

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Background

The importance of **downstream tsunami response** was emphasised during the 10th Anniversary Conference of the Indian Ocean tsunami (Jakarta, November 2014).

The ICG/IOTWMS Secretariat held TEMPP workshops during 2018-2019 to address **tsunami evacuation, mapping, plans and procedures**.

The downstream tsunami response has gained focus through the **Indian Ocean Tsunami Ready Pilot Programme** (2017-2021).

The **2018 Capacity Assessment of Tsunami Preparedness in the Indian Ocean** looked at the downstream tsunami response processes through to community level.

The 2021 commencement of the **IOC-UNESCO Tsunami Ready Programme** aims to increase community tsunami preparedness.

This aligns with the **UN Ocean Decade's (2021-2030) Tsunami Programme** aim to *“make 100% of communities at risk of tsunami prepared for and resilient to tsunamis by 2030”*.

Tsunami Policies, Plans and Guidelines at Local Level

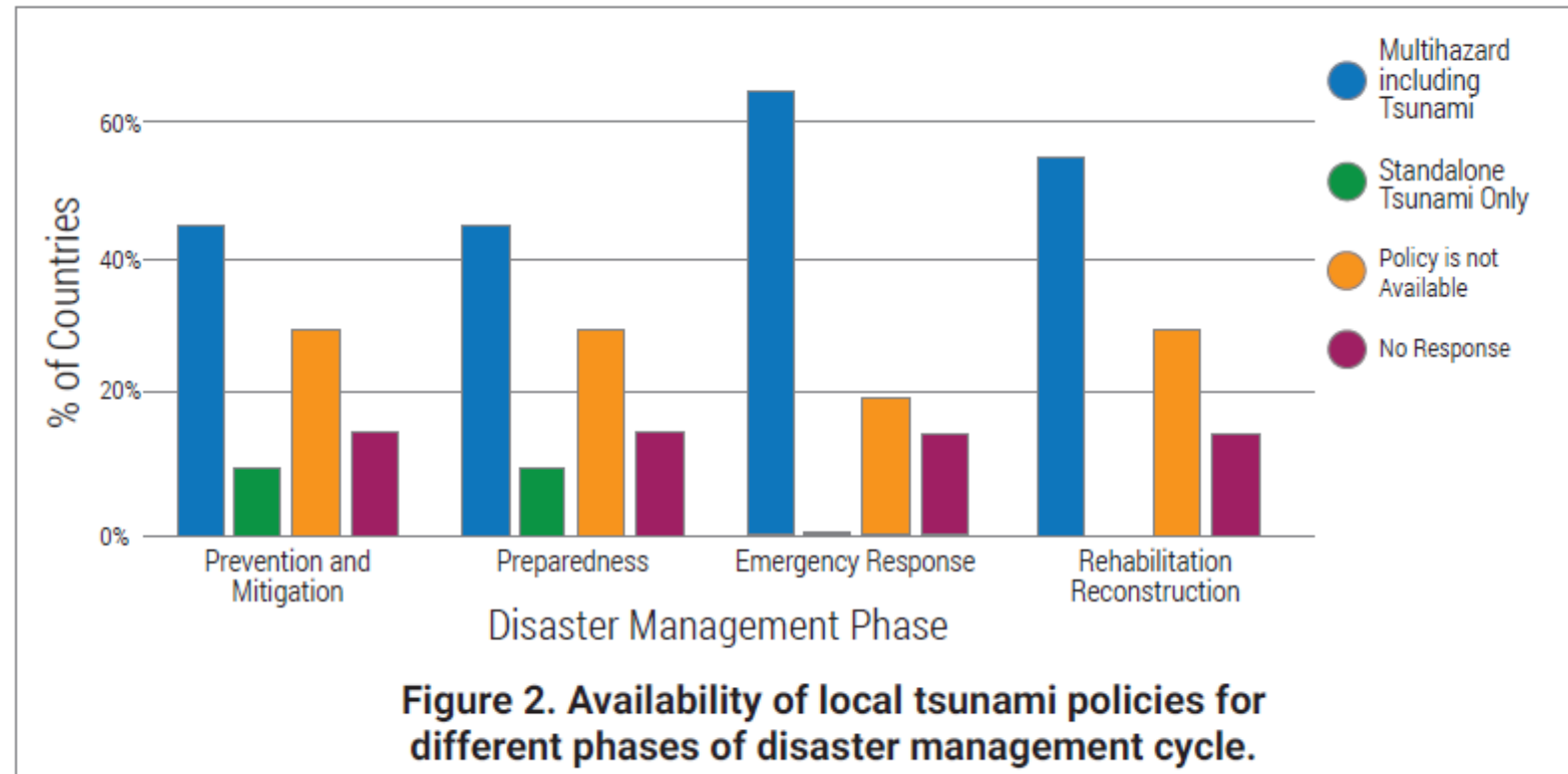


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Support is needed to increase the availability of policies, plans and guidelines, in particular:

- Across all **disaster management cycle phases**:
 - Prevention & Mitigation
 - Preparedness
 - Recovery & Reconstruction
- Particularly at the **local level**

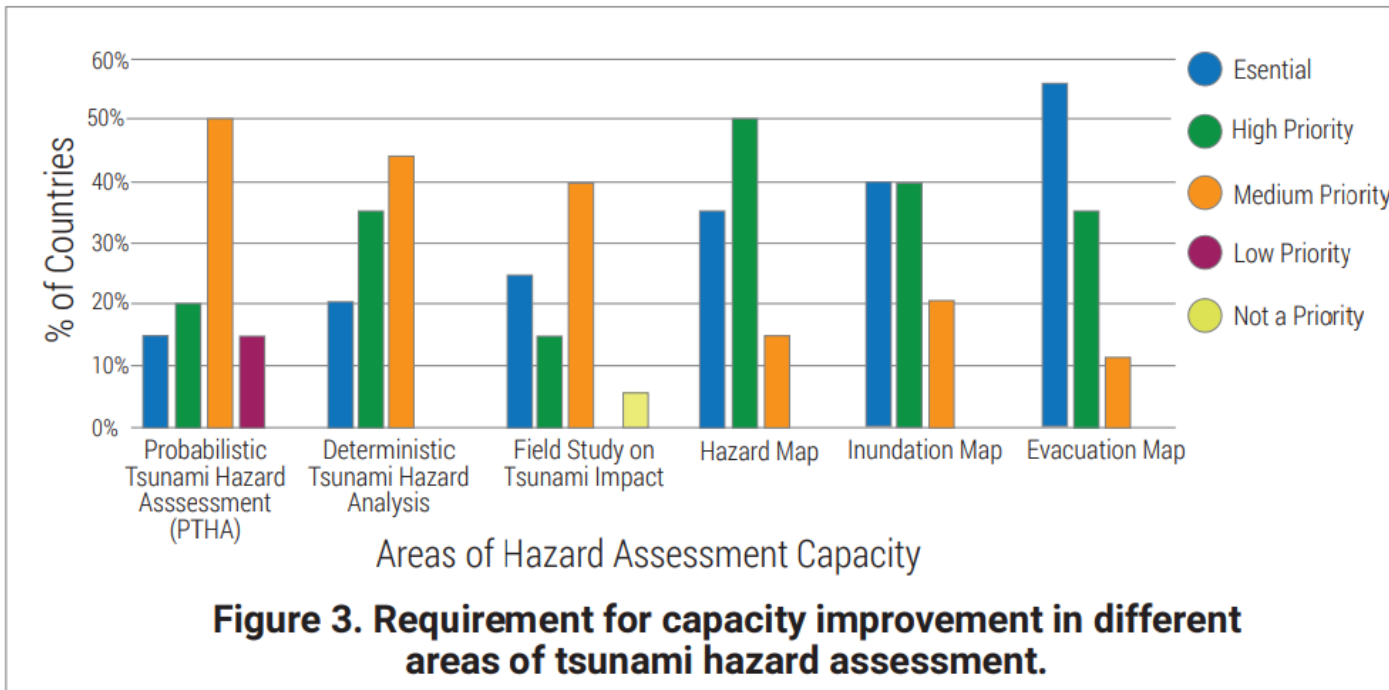


Tsunami Hazard Assessments



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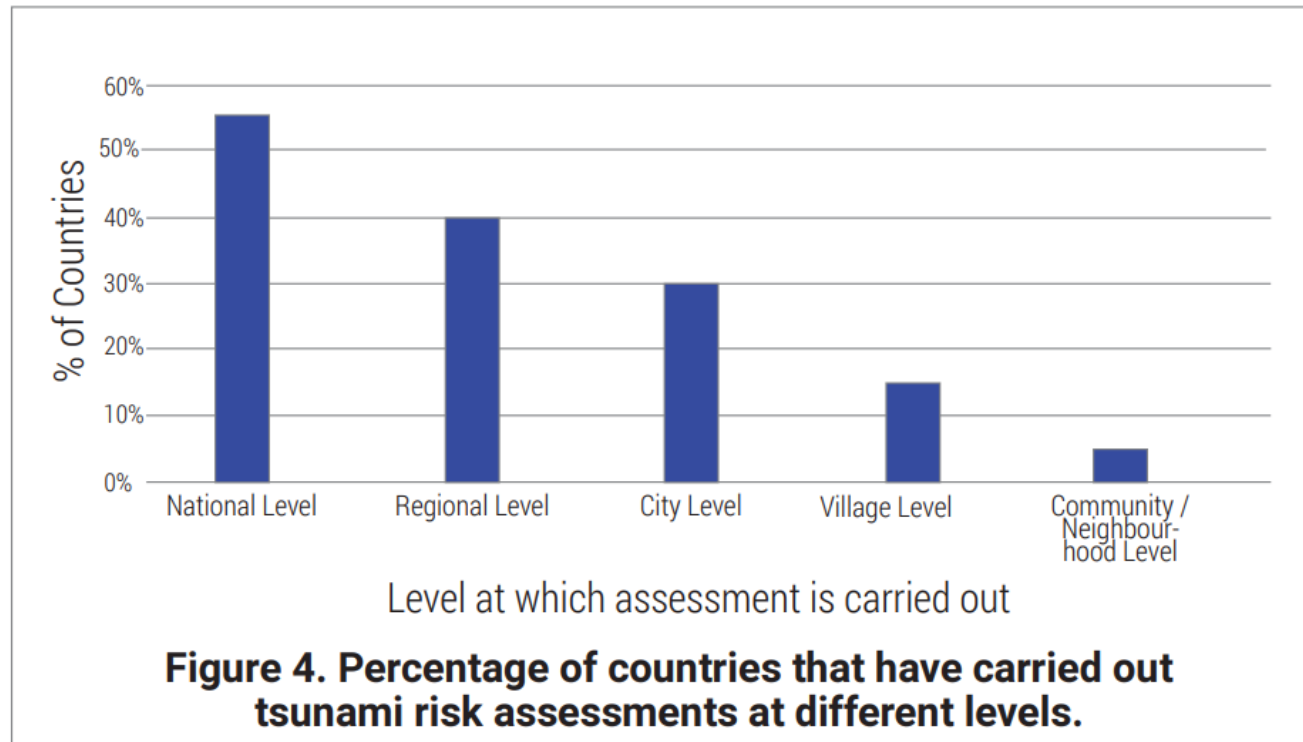
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In terms of hazard assessments and related outputs, support is a priority for producing hazard maps, inundations maps and evacuation maps.

This is being address as part of the UNESCO-IOC Tsunami Ready Programme.

Tsunami Risk Assessments



Over half of reporting countries have carried out tsunami risk assessments at the National Level.

Further support is need to conduct risk assessments downstream, especially at the city, village, and community levels.



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Recommendations for Hazard and Risk Assessments

Support requirements for tsunami hazard and risk assessments should focus on

1. Increasing the availability of accessible data for these assessments
2. Engaging and developing the capacity of more people to
 - Conduct the assessments
 - Develop products including risk maps, evacuation maps, guidelines, and action plans.
3. More risk assessments are required at local level: city, village, community

Upstream Emergency Response SOP



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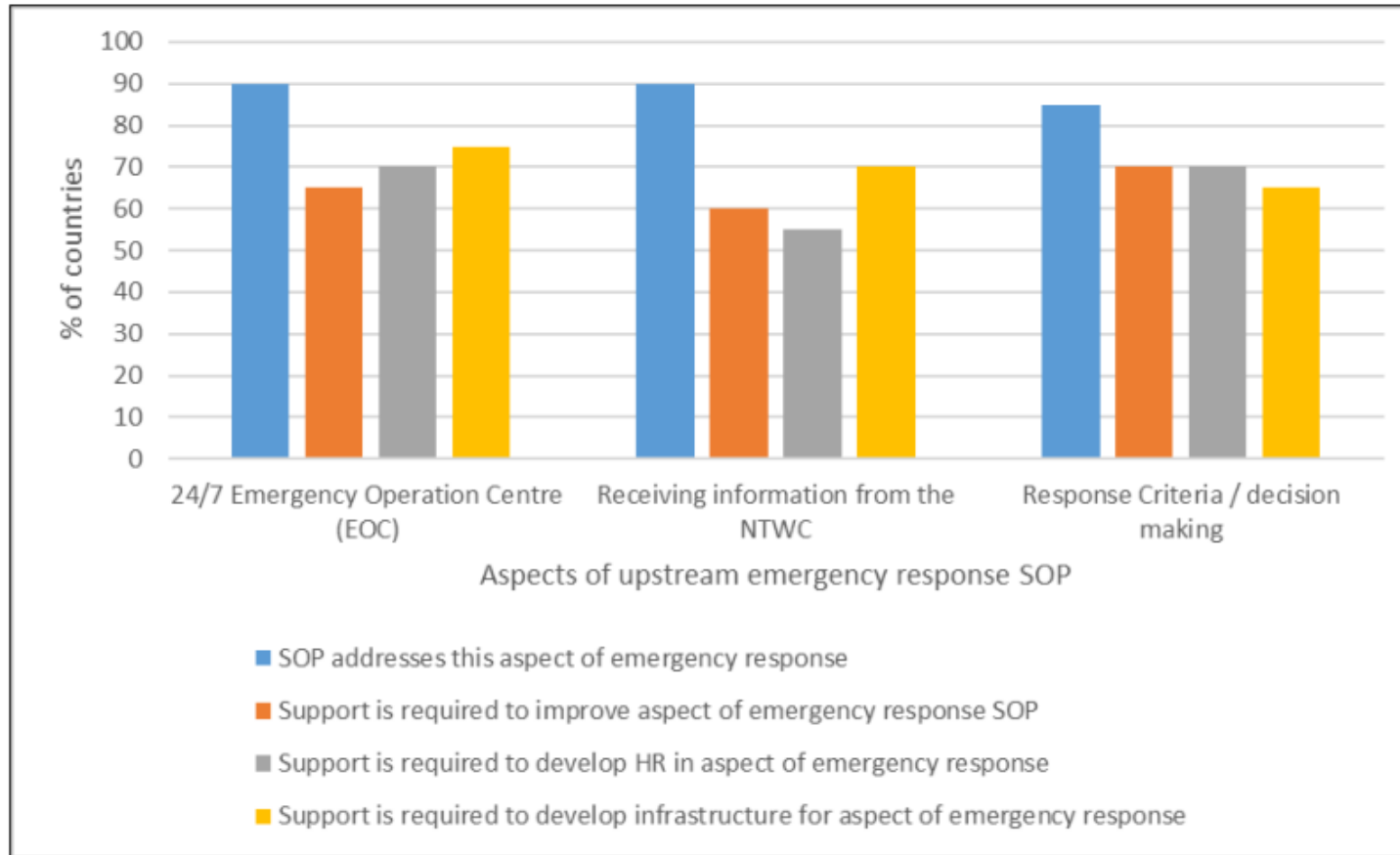


Figure 33. Support required to develop upstream emergency response SOP

Most countries have SOPs that address a) the operation of a 24/7 emergency operation center, b) receiving information from the NTWC, and c) response criteria and decision making.

However, many countries also require support to develop and/or improve SOPs in all three aspects.

Associated support is also required for human resources and infrastructure

Downstream Emergency Response SOP

Most countries have downstream emergency response SOPs for tsunami.

Support for SOP improvement was identified in these areas

- Warning dissemination
- Communication with the National Tsunami Warning Center
- Communication with other stakeholders
- Evacuation call procedures
- Communication with local government
- Media arrangements

Also, the development of **community level evacuation SOPs** is required.

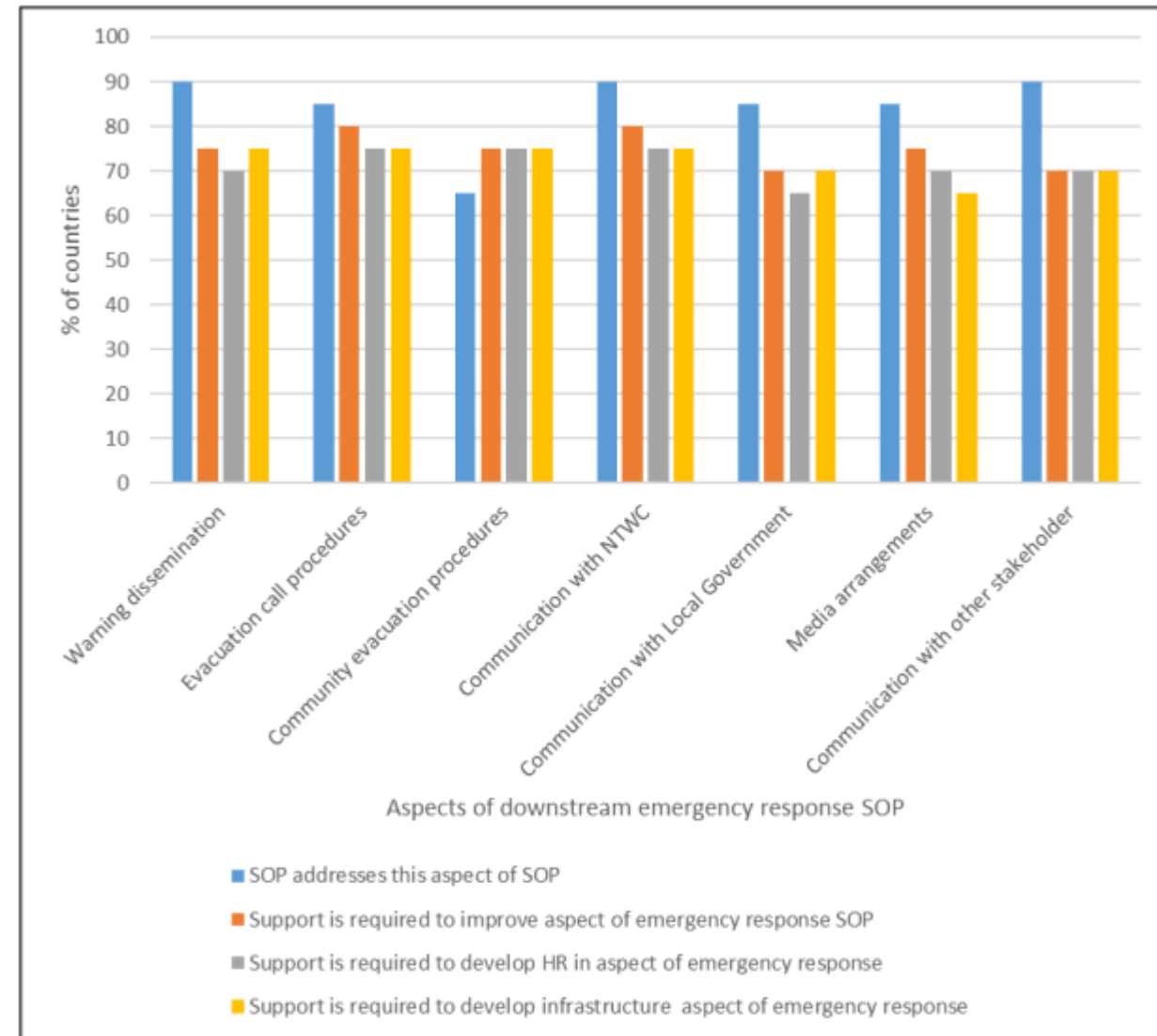
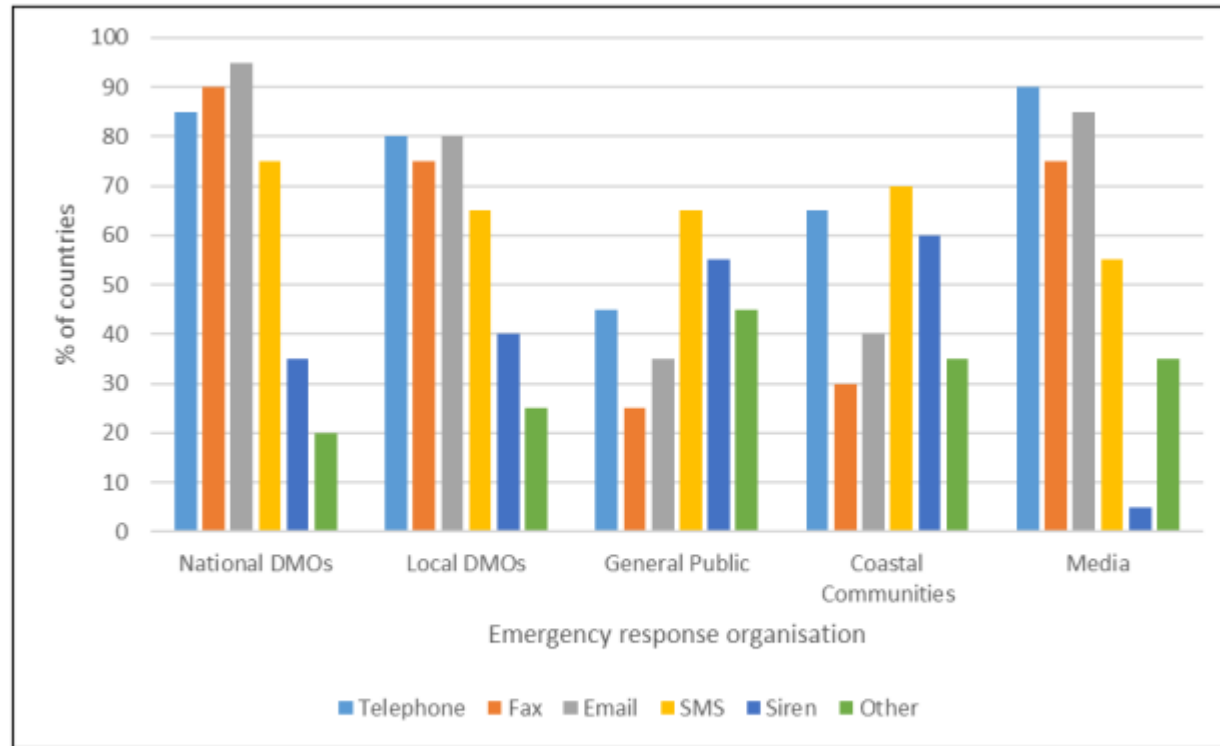


Figure 34. Support required to develop downstream emergency response SOP

Communication Methods for Emergency Response



Phone, fax, email, SMS, Siren and other methods are being used for emergency response.

Other methods include websites, social media, radio, apps, broadcast alert systems, and television.

Figure 35. Communication methods for emergency response

Standard Operating Procedures



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The 2018 Capacity Assessment indicates that further support is required, particularly for **downstream activities** such as **community evacuation** and the **interface between the upstream tsunami warning and downstream emergency management operations**.

Support is required to address the lack of **community level SOPs** in 35% of countries.

Almost all countries are willing to share their SOPs with the Indian Ocean Tsunami Information Center (IOTIC) and other Indian Ocean countries to assist in capacity building in the region.

Awareness Capacity Development

It is essential that the communities that are vulnerable to the effects of tsunamis are knowledgeable with their underlying risks, their effects to livelihood, and how to respond when they happen.

Development of community evacuation plans and testing these during exercises is needed.

Tsunami information material can be disseminated to at-risk communities through the media, workshops/seminars, awareness materials, the internet, signage and billboards.

If not already in existence, tsunami-related curriculum programmes should be developed in schools to build knowledge in youth.

Preparedness Capacity Development



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Due to the nature of tsunamis, at-risk communities must be able to respond quickly and efficiently, especially to near-field tsunamis.

This requires putting in place systems and processes to enable response coordination (preparedness) such as emergency operation centres, communication systems, evacuation plans and maps, and evacuation shelters.

These processes should be included within SOPs.



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Response Capacity Development

Countries should conduct exercises on a regular basis to test early warning systems and evacuation planning and emergency response planning at all levels.

To ensure that organisations and communities can respond to tsunami threats, sustainable capacity-building programmes should be developed and delivered.

Considering the infrequent nature of tsunamis, effort should be made to pursue community preparedness using a multi-hazard approach.

Member States should consider the implementation of the IOC-UNESCO Tsunami Ready programme, which provides a structured and systematic framework for building community preparedness.

Tsunami Ready Indicators (12)



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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 understood 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 2 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.

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Conclusions



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Enable sharing of best practices between Member States.

- Standard Operating Procedures
- Tsunami Warning Chains
- Educational Materials

Support in improving standard operating procedures for tsunami warning and evacuation (WG-3).

- At the upstream-downstream interface
- Between agencies/organisations
- At community level

Encourage the incorporation of tsunami awareness into the school curricula and develop educational materials such as teaching kits.



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