GP-STAR

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The Sentinel Asia-Tsunami Working Group (Joint-Chairman)

Sentinel Asia STEP3 Evolution



Purpose/Goal

Contribution to enhancing capabilities of tsunami disaster management in Asia-Pacific countries by integrating advance knowledge in tsunami science and engineering with the space-based data and technology for:

- Tsunami Risk Assessment
- Tsunami Forecasting/Warning
- Mapping Tsunami Inundation/Impact
- Tsunami Evacuation Plan
- Emergency Observation
- Tsunami Risk Awareness/Education
- Training Program/capacity building

Activities of WG

- Review of tsunami disaster mitigation and response protocols of each country (including forecasting, early warning, emergency observation, monitoring, mapping)
- Review of the use of EO data in past tsunami events
- Making plan of emergency observation for mapping impact in disaster response
- Making plan of using archive data for disaster mitigation, response and recovery
- Developing practical technology/tools that integrate advance computational method in specific disaster hazard assessment with the EO/satellite data and technology for tsunami disaster mitigation, rapid mapping and damage assessment during the disaster (ER phase) and monitoring the recovery in post disaster situation
- Keep in mind "User-oriented approach", not "Providers-oriented".
- Making plan of success story (Definition of success story)
 - End to end system/services for tsunami disaster mitigation
- Web-based information sharing (Activities/Efforts/Outcomes) in Sentinel Asia web site

Background: Tsunami Disaster and its impacts



Background:

Tsunami Disaster and its impacts

- How extensive the tsunami penetrates? Where is the most affected areas?
- How many people are exposed, killed, and injured ?
- How many structures/infrastructures are damaged ? What are the implications to the basic services?
- How extensive disaster relief activities should be deployed ?
- How much economic losses are ?
- How much amount of tsunami debris need to be removed ?
- What kind of basic infrastructures are needed to be built soon to support early recovery?



~weeks

~days

~minutes

~hours



How extensive the tsunami penetrates ? Optical satellite remote sensing (JAXA ALOS/AVNIR-2)



Koshimura et al. (2012)

Structural damage interpretation using aerial photos GSI (Geospatial Information Authority of Japan)



Gokon et al. (2012)

Challenges: towards real-time tsunami inundation forecasting and damage mapping for near-field tsunami events



Koshimura et al. 2014 Inundation Depth (m)



Tsunami warning: an experience during the 2011 Japan tsunami





Challenges: towards real-time tsunami inundation forecasting and damage mapping for near-field tsunami events

- 1. Rapid determination of tsunami source model (Rapid estimation of coseismic fault model).
- 2. Acceleration of tsunami inundation simulation with high-performance computing infrastructure (HPCI) or other advance computational methodology.
- 3. Establishing a reliable quantitative damage estimation and mapping methods to provide responders with mapping products.
- 4. Robust information dissemination to the public.

Some important research are now on going, but at the end we need a an accessible platform/interface (can be a stand-alone tools or online tools) to make the research result available to be used by DRR community.

Mission of GP-STAR

• What is the mission of GP-STAR in your view?

To facilitate the development of a multi stake holder partnership in mainstreaming the use of EO and it's related data and technology in the complete cycle of disaster management (pre-, duringand post-disaster) • What is the mission of GP-STAR in your view? (based on TOR)

To facilitate the use of Earth Observation as well as satellite-based technology and application through a variety of efforts

- Providing advice to governments
- Organizations and projects on the use of space technologies and applications in disaster risk reduction efforts
- Provision of relevant publications and discussion fora.

Contribution to GP-STAR activities

- What activities, projects, programms can you affiliate/contribute to GP-STAR
 - Technology development to establish tools for rapid assessment of specific disaster and it's related potential damage on human and critical infrastructures.
 - Conceptual guidance related to mainstream the use of EO in DRR at the international level and it's potential implementation guidelines for regional, national and local level.
 - Derive the possible indicators to monitor the of the SFA implementation in the field of EO and it's integration on DRR at the international, regional and national level.

Contribution to the expected outcomes

- What outcomes (procedures, products, information, knowledge, know-how) can you contribute
 - International framework for the partnership to be derived by the member as a regional, national and local guidelines in mainstreaming the use of EO for DRR
 - End-user oriented maps to understand the hazards, exposure, risks and to monitor and to assist the *build back better* implementation, and to provide complete pictures for all aspects of disaster management cycle.
 - The integration of EO data and technology with computational model to estimate hazard and risks in each type of disaster
 - Applicable technology and/or tools to use EO data by using open source platform to accelerate mainstreaming of EO data for DRR particularly for developing countries.

Please provide input to the following question:

- What role and working field in GP-STAR do you foresee for your organisation
 - Contribute on the development of technology to integrate EO and computational technology in specific hazard such as tsunami and coastal flood to establish tools or online tools to rapidly estimate damage and loss due to specific hazard
 - Development of scientific method on assessment of hazard and risk for slow onset disaster such as coastal flooding due to sea level rise and/or climate change, and for recovery monitoring in case of rapid onset disaster such as earthquake and tsunami

Please mark (x) your contribution/interest according to below matrix,

see: Input_partners_GP-STAR_Expert_meeting.xls

Ministry of Marine Affaris and Fisheries									
							HAZARD		
SCOPE-PURPOSE	TARGETS - I	INDICAT	ORS	PRIORITIES	FOR ACTION	COUNTRY / REGION	Earthquake	Tsunami	Flood
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isk of small-scale and large and slow-onset disasters, irds as well as related al hazards and risks. It aim ent of disaster risk in nin and across all sectors	X	·'	<u> </u>	X	+ 	Indonesia/global wide		X	X
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nt framework will apply to thequent and infrequent, sudd ed by natural or manmade hental, technological and biolo uide the multi-hazard manag ment at all levels as well as			 					 +	
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<u>Thank you</u>

Abdul Muhari, PhD

Co-Chairman Tsunami Working Group Sentinel Asia

Ministry of Marine Affairs and Fisheries Republic of Indonesia