



# **Standard Operation Procedure (SOP) for smooth EOR**

**Makoto Ikeda, Asian Disaster Reduction Center (ADRC)  
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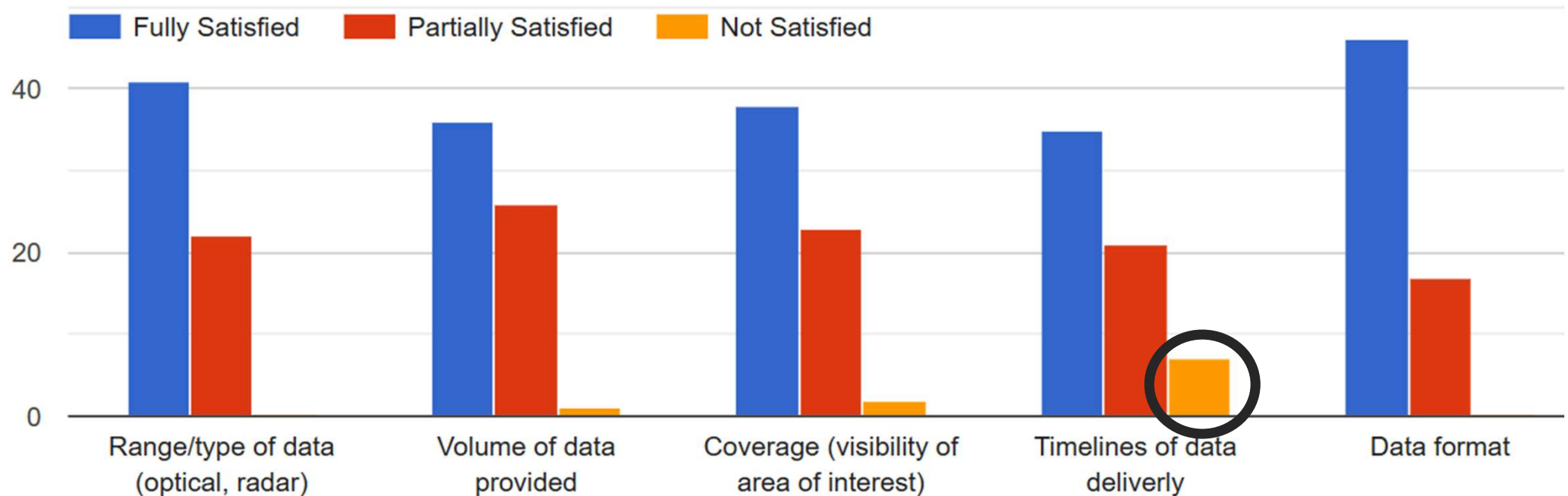
*The 8th Joint Project Team Meeting (JPTM)  
“Expand Space Innovation through Diverse Partnerships”  
September 17th-18th, 2023*

*Auditorium room, BRIN Headquarter located at Jalan MH Thamrin Jakarta*

# **Background**

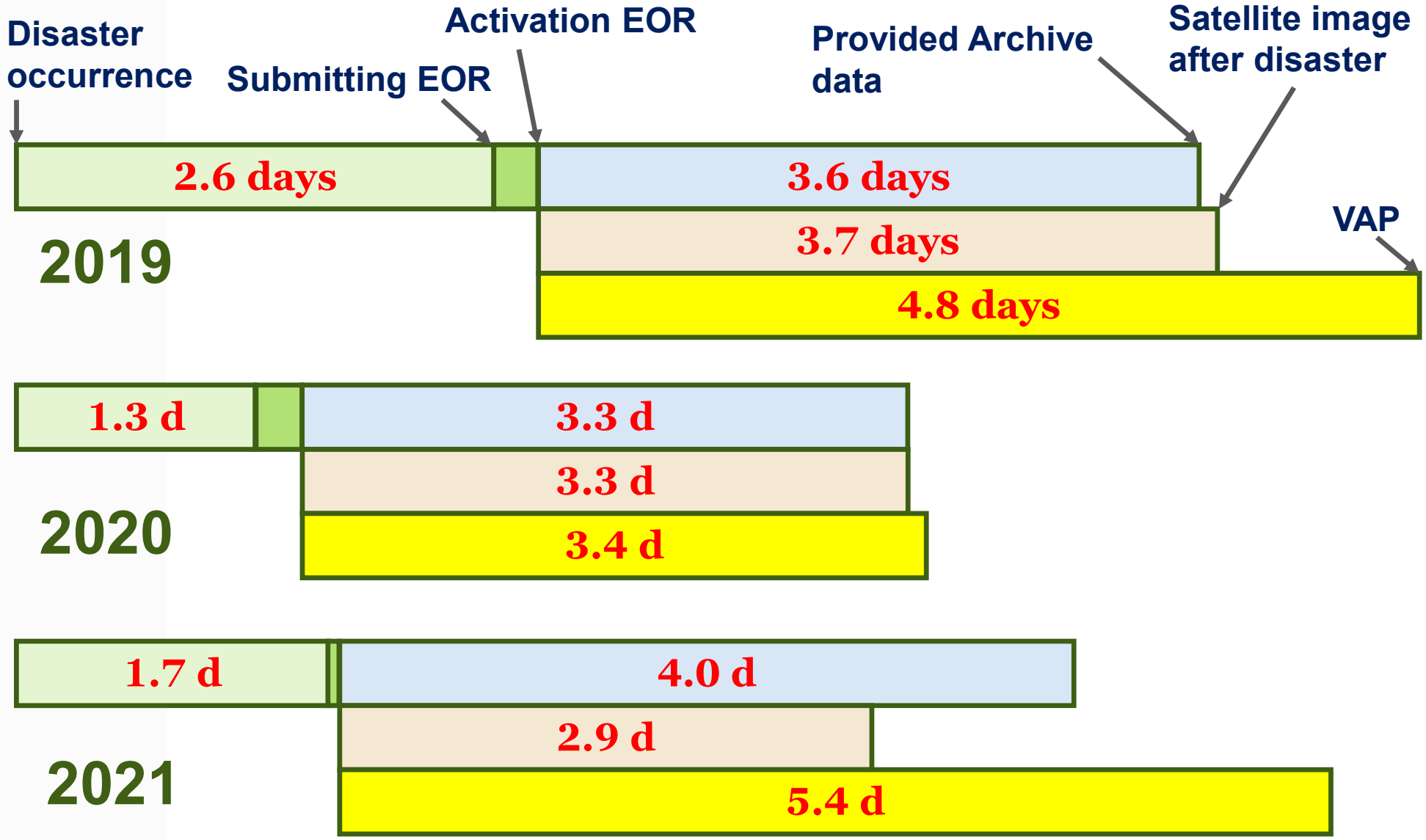
# Questionnaire on EOR (Impression)

✓ Did our response or provided data meet your expectations?



**It was slightly not satisfaction regarding “Timeline of data deliver”.  
How about actual data???**

# Questionnaire on EOR



Need to consider a “swift activation after disaster”  
- > SOP is one of our suggestion (to be explained on DAY 2)

# Trigar for making EOR

[CRITERIA of each disaster for EOR]

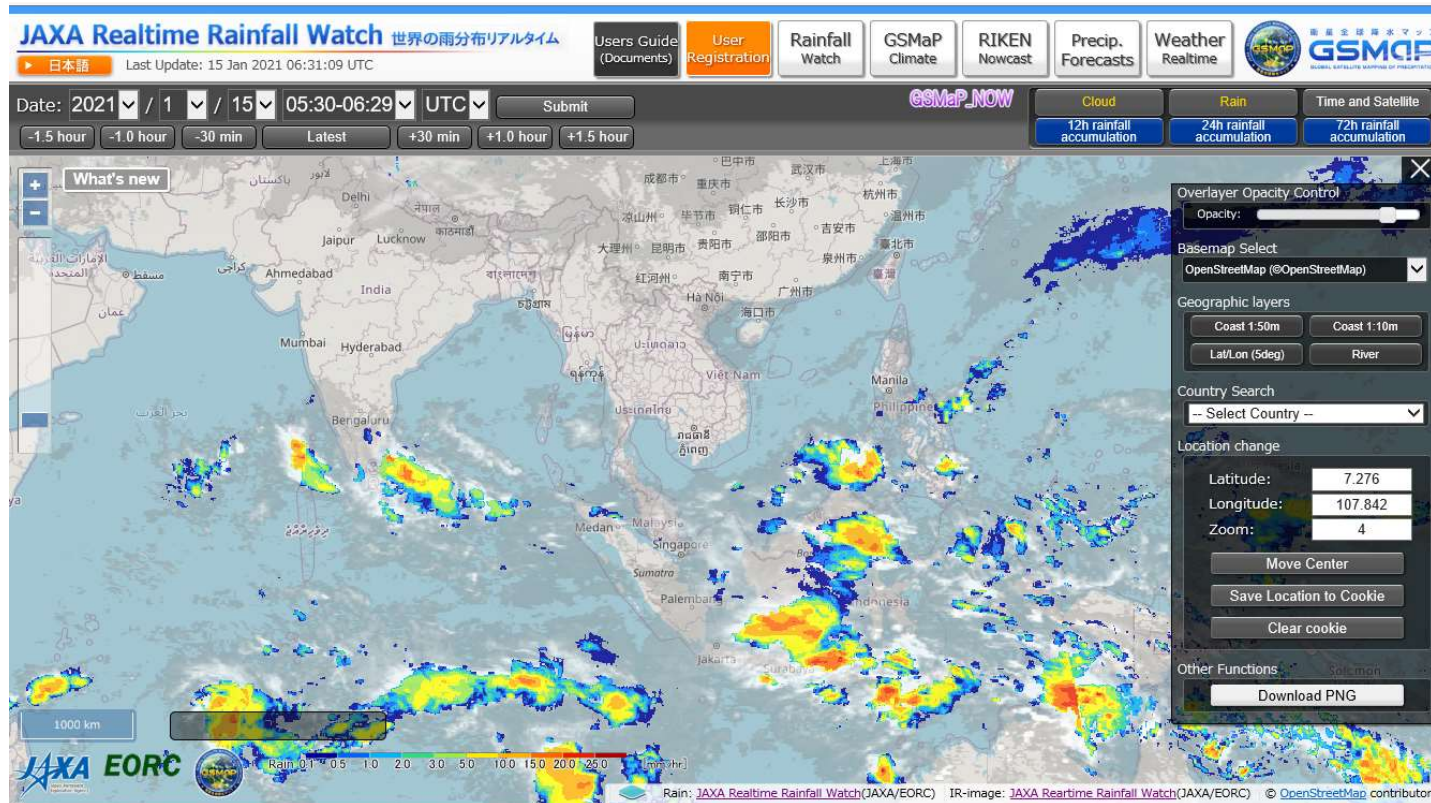
## 1. Earthquake : **Mercalli Intensity Scale (MMI), VII or more**

CIIM Intensity	People's Reaction	Furnishings	Built Environment	Natural Environment
I	Not felt			Changes in level and clarity of well water are occasionally associated with great earthquakes at distances beyond which the earthquakes felt by people.
II	Felt by a few.	Delicately suspended objects may swing.		
III	Felt by several; vibration like passing of truck.	Hanging objects may swing appreciably.		
IV	Felt by many; sensation like heavy body striking building.	Dishes rattle.	Walls creak; window rattle.	
V	Felt by nearly all; frightens a few.	Pictures swing out of place; small objects move; a few objects fall from shelves within the community.	A few instances of cracked plaster and cracked windows within the community.	Trees and bushes shaken noticeably.
VI	Frightens many; people move unsteadily.	Many objects fall from shelves.	A few instances of fallen plaster, broken windows, and damaged chimneys within the community.	Some fall of tree limbs and tops, isolated rockfalls and landslides, and isolated liquefaction.
VII	Frightens most; some lose balance.	Heavy furniture overturned.	Damage negligible in buildings of good design and construction, but considerable in some poorly built or badly designed structures; weak chimneys broken at roof line, fall of unbraced parapets.	Tree damage, rockfalls, landslides, and liquefaction are more severe and widespread with increasing intensity.
VIII	Many find it difficult to stand.	Very heavy furniture moves conspicuously.	Damage slight in buildings designed to be earthquake resistant, but severe in some poorly built structures. Widespread fall of chimneys and monuments.	
IX	Some forcibly thrown to the ground.		Damage considerable in some buildings designed to be earthquake resistant; buildings shift off foundations if not bolted to them.	
X			Most ordinary masonry structures collapse; damage moderate to severe in many buildings designed to be earthquake resistant.	

# Trigar for making EOR

[CRITERIA of each disaster for EOR]

## 2. Flood: Rainfall, Upper “200mm/24 hours” or “400mm/72 hours”



**GSMaP** is a multi-satellite global precipitation dataset of “Global Precipitation Measurement Mission” or “GPM Mission”, jointly led by JAXA and NASA. GSMaP is composed of JAXA’s radar sensor named Dual-Frequency Precipitation Radar (DPR), and GPM partners’ microwave radiometers, and infra-red imagers on-board constellation satellites. GSMaP provides hourly horizontal distribution of precipitation with few latency after observation. \*GSMaP website “JAXA Realtime Rainfall Watch”:

[https://sharaku.eorc.jaxa.jp/GSMaP\\_NOW/index.htm](https://sharaku.eorc.jaxa.jp/GSMaP_NOW/index.htm)

# Trigar for making EOR

[CRITERIA of each disaster for EOR]

## 3. Cyclone (or Typhoon, Hurricane): **Saffir-Simpson Scale**

Hurricane Intensity Scale (Wind Damage)

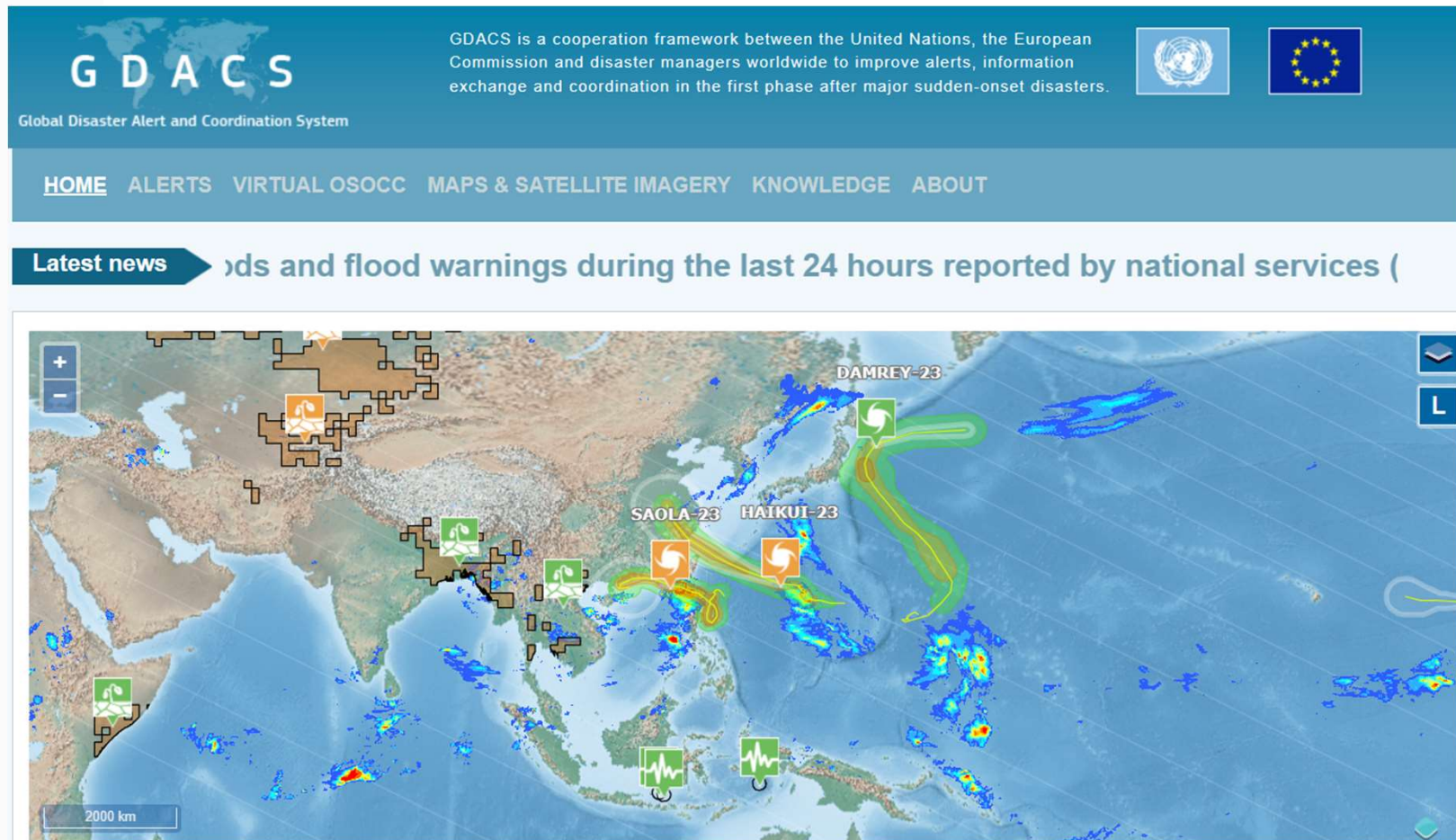


Wind speed	Category 1	Category 2	Category 3	Category 4	Category 5
	75 - 95 mph	96 - 110 mph	111 - 130 mph	131 - 154 mph	155 + mph
	33-42 ms <sup>-1</sup>	43-49 ms <sup>-1</sup>	50-58 ms <sup>-1</sup>	59-69 ms <sup>-1</sup>	70+ ms <sup>-1</sup>

# Trigar for making EOR

[CRITERIA of each disaster for EOR]

All of disasters: GDACS (Global Disaster Alert and Coordination System)



[\(https://www.gdacs.org/\)](https://www.gdacs.org/)

ADRC considers to make a EOR when we receive a red-alert from GDACS. This activity will be mentioned on SOP.



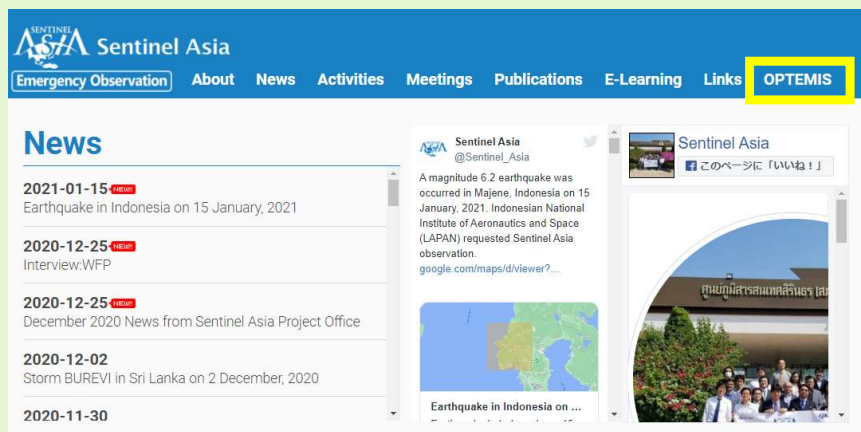
# **About Standard Operation Procedure (SOP)**

*- For making swift EOR after disaster -*

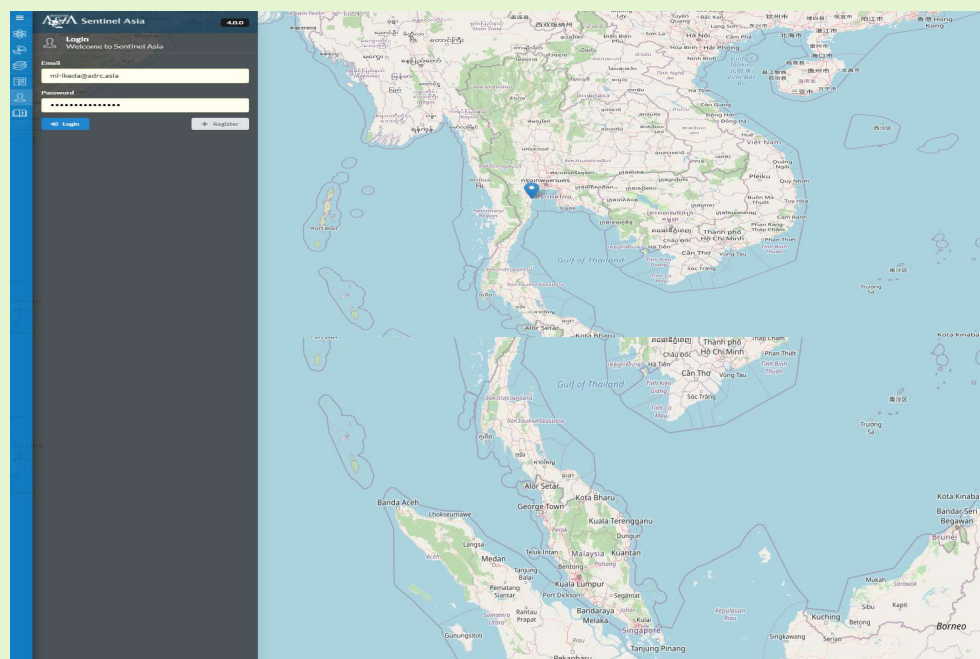
# What is “OPTEMIS”

The new system for EOR, named “OPTEMIS”, was developed by the collaboration of JAXA, GISTDA, and NARL started its operation on 28 October 2019. “OPTEMIS” enable easy-registration for making EOR.

## [How to access]



SA Website (<https://sentinel-asia.org/index.html>)



OPTEMIS (<https://optemis.sentinel-asia.org/>)

*You can create a OPTEMIS account as POC of each JPT member.*

# Objective of SOP for “EOR”

SOP is aimed at contributing to practical and effective disaster management activities through collaboration with JPT member and disaster management organizations. by making EORs to Sentinel Asia as promptly and timely as possible.

This SOP describes the procedure of EOR via OPTEMS following CRITERIA of each disaster, and defines the role to be played by each stakeholder.

The image is a composite graphic on a light green background. On the left, two white document pages are shown. The top page is titled 'Standard Operating Procedure for making Emergency Observation Requests to Sentinel Asia regarding disasters in Cambodia' and has 'Version: 1.00' and 'March 2022' at the bottom. The bottom page is titled 'Standard Operating Procedure for making Emergency Observation Requests to Sentinel Asia regarding disasters in Lao People's Democratic Republic' and also has 'Version: 1.00' and 'March 2022' at the bottom. A large green arrow points from these documents towards the right. On the right side, there are three main elements: 1) A screenshot of the 'Sentinel Asia' login page with fields for 'Email' and 'Password' and a 'Log In' button. 2) A map of Southeast Asia with the text 'OPTEMS (Explanation of registration)' overlaid. 3) A screenshot of the 'GDACS' (Global Disaster Alert and Coordination System) website, showing a navigation menu and a 'Latest news' section. Below the news section is a map of the region with various disaster markers and alerts.

**SOP**

Standard Operating Procedure  
for making Emergency Observation Requests to Sentinel Asia  
regarding disasters in Cambodia

Version: 1.00

March 2022

Standard Operating Procedure  
for making Emergency Observation Requests to Sentinel Asia  
regarding disasters in Lao People's Democratic Republic

Version: 1.00

March 2022

**OPTEMS**  
(Explanation of registration)

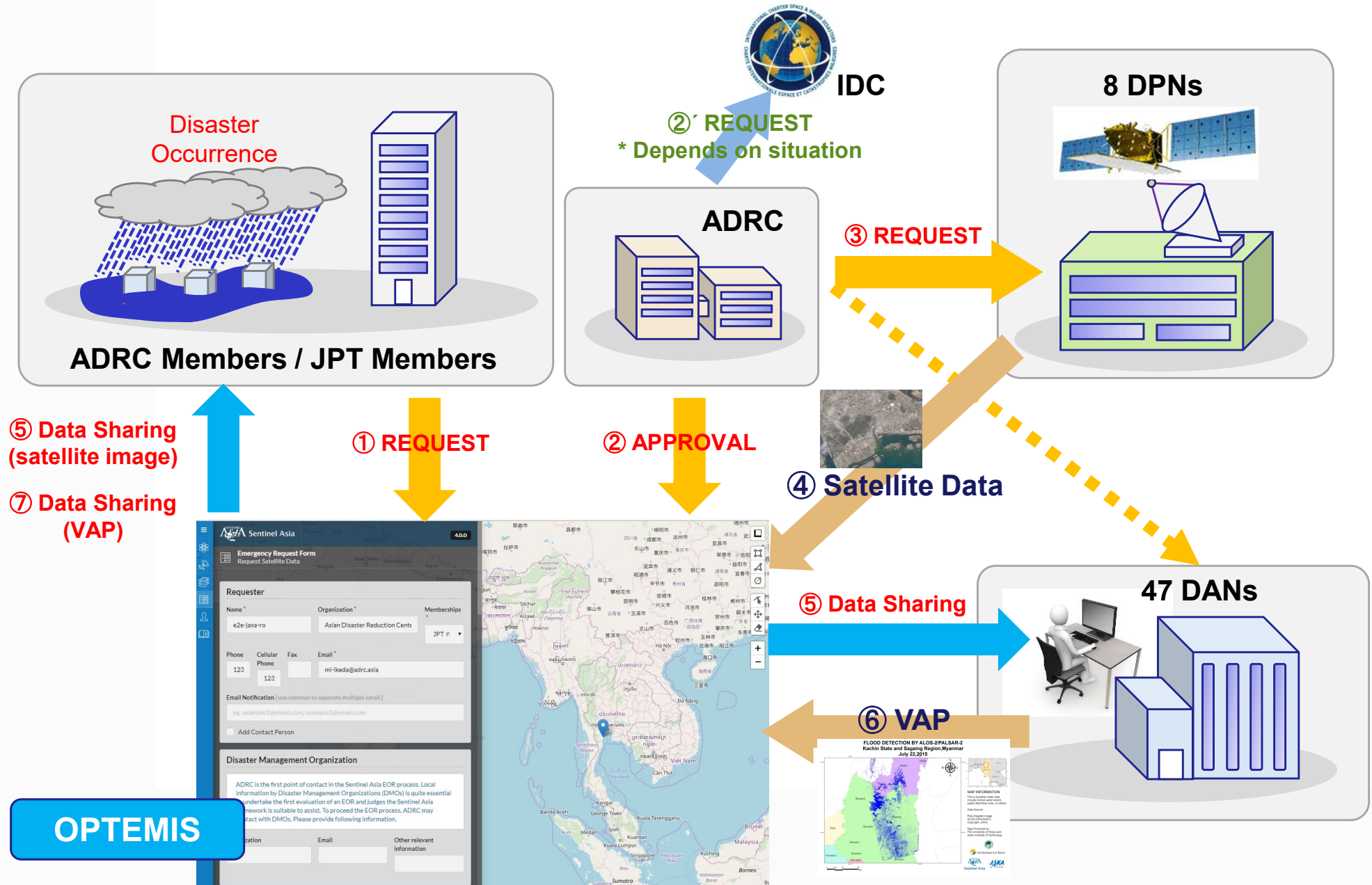
**GDACS**  
(CRITERIA of each disaster)

# Developed “SOPs”

Target country/region	Collaboration organizations	Established in
Myanmar	DMH, DDM, MIMU, (AHA Centre)	March 2021
Thailand	GISTDA, DDPM, ADPC, (AHA Centre)	March 2021
Vietnam	MARD, MONRE, VAST, (AHA Centre)	March 2021
Central Asia and Caucasus	CAIAG, Ministry of Emergency Situations (Kyrgyz Republic) Committee of Emergency Situations and Civil Defense (Tajikistan) Ministry of Emergency Situations (Uzbekistan)	February 2022
Cambodia	National Committee for Disaster Management (NCDM)	February 2022
Lao PDR	Ministry of Labour and Social Welfare	February 2022
Pacific Island Countries	National Disaster Management Office (Fiji) National Disaster Management Office (Solomon Islands) Secretariat of the Pacific Community (SPC/SOPAC)	February 2022

# How to Request?

## Procedure of Emergency Observation Request (EOR)



# Contents of SOP

Contents of SOP is as:

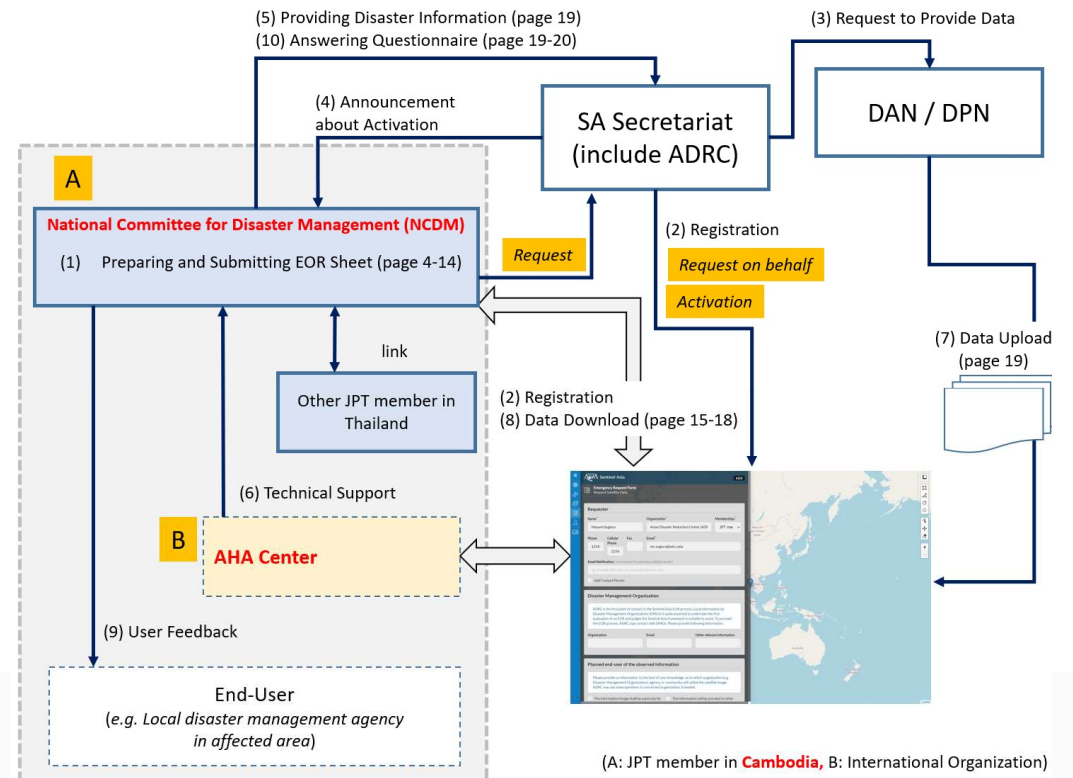
1. Preface
2. Preparing and Submitting EOR (compulsory action)
3. Use of Satellite Images and Value-Added Products (VAP)
4. Providing Disaster Information and Feedbacks

# Contents of SOP

Contents of SOP is as:

1. Preface
2. Preparing and Submitting EOR (compulsory action)
3. Use of Satellite Images and Value-Added Products (VAP)
4. Providing Disaster Information and Feedbacks

**Basic information about this SOP (e.g., Objectives, member list, and flowchart) is shown.**



# Contents of SOP

Contents of SOP is as:

1. Preface
- 2. Preparing and Submitting EOR (compulsory action)**
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**Specific procedure for “OPTEMIS” is shown.**

**Sentinel Asia** 4.0.0

**Emergency Request Form**  
Request Satellite Data

**Requester**

Name \* Organization \* Memberships  
e2e-jaxa-ro Asian Disaster Reduction Cente JPT n

Phone Cellular Phone Fax Email \*  
123 123 mi-ikeda@adrc.asia

Email Notification ( use commas to separate multiple email )  
eg. example1@email.com, example2@email.com  
 Add Contact Person

**Disaster Management Organization**

ADRC is the first point of contact in the Sentinel Asia EOR process. Local information by Disaster Management Organizations (DMOs) is quite essential to undertake the first evaluation of an EOR and judges the Sentinel Asia framework is suitable to assist. To proceed the EOR process, ADRC may contact with DMOs. Please provide following information.

Organization Email Other relevant information



# Contents of SOP

Contents of SOP is as:

1. Preface
2. Preparing and Submitting EOR (compulsory action)
3. **Use of Satellite Images and Value-Added Products (VAP)**
4. Providing Disaster Information and Feedbacks

**Specific procedure, how to download satellite images and VAP, is shown.**

The screenshot shows the Sentinel Asia website interface. The top navigation bar includes 'Emergency Observation', 'About', 'News', 'Activities', 'Meetings', 'Publications', 'E-Learning', 'Links', and 'OPTEMIS'. The main content area features a 'News' section with several articles, including one titled 'Storm BUREVI in Sri Lanka on 2 December, 2020'. Below the news section is a 'Latest Report 1: Storm BUREVI in Sri Lanka on 2 December, 2020' with a map of Sri Lanka and a 'Disaster Situation' section. The 'Disaster Situation' section includes details such as 'Disaster Type: Storm', 'Country: Sri Lanka', 'Occurrence Date (UTC): 2 December, 2020', 'SA activation Date(UTC): 2 December, 2020', 'Requester: Ministry of Disaster Management', and 'Escalation to the International Charter:'. A 'Disaster Situation' section follows, starting with 'According to the GENERAL WEATHER FORECAST FOR NEXT 24 HOURS issued by the Department of Meteorology Sri Lanka. The deep depression is expected to intensify further into a cyclonic storm and very likely to cross Sri Lanka. Due to this situation, the early and windy condition is expected to enhance considerably over the island. The depression area in the south-east Bay of Bengal has concentrated into a deep depression and lay centered 460 km southeast to Trincomalee at 1130 hrs today (01st December). The system is very likely to intensify into a cyclonic storm during the next 24 hours. The cyclonic storm 'BUREVI' very likely to cross Sri Lanka and the system is very likely to move west-northwards and cross the eastern coast of Sri Lanka between Batticaloa and Point Pedro around tomorrow (02nd December) evening/night. Intermittent showers/thunderstorms will occur in the Eastern, Northern, Northern-central, North-western, Central, and Sabaragamuwa provinces. Very heavy rainfall above 200mm can be expected at some places. Therefore on behalf of the Director-General of the Disaster Management Centre Sri Lanka, request to activate Sentinel Asia.'

The screenshot shows the 'REQUEST INFORMATION AND TRACKING' interface. The top navigation bar includes 'Nav', 'Back to Homepage', 'Asian Disaster Reduction Center (ADRC)', 'Muzani Sugara Member', 'Logout', and '4.00'. The main content area features a map of the Indian Ocean region with a highlighted area. Below the map is an 'ADRC Comment' section with 'Approve Request' and 'Decline Request' buttons. The 'Tracking' section includes a table with columns for 'Organization', 'Status', 'Comments', and 'Data'. The 'Status' column is further divided into 'Acknowledge', 'Load Data', 'Analyzed', and 'Uploaded'. The table lists various organizations and their tracking status.

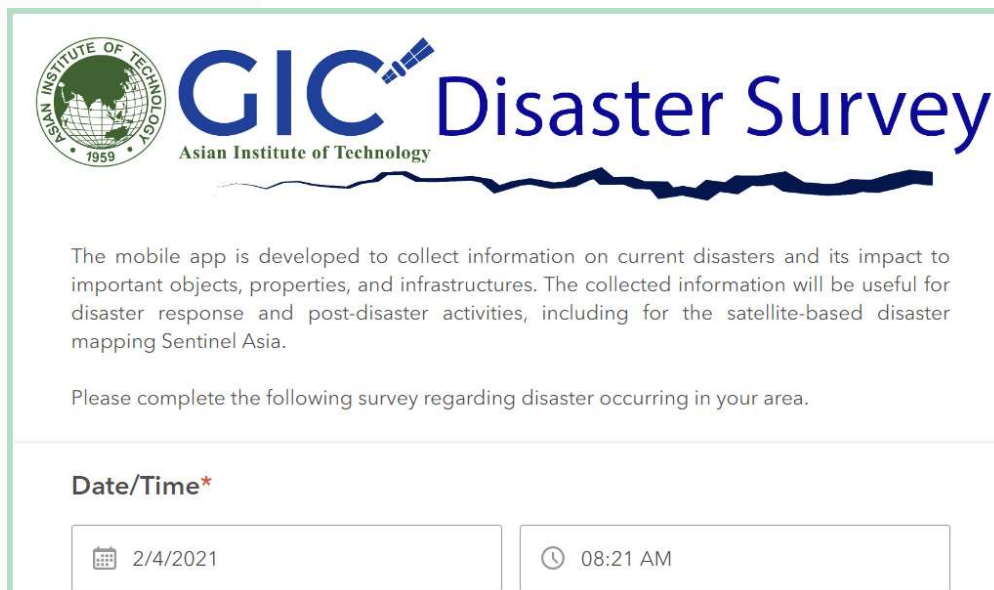
Organization	Status				Comments	Data
	Acknowledge	Load Data	Analyzed	Uploaded		
Survey Department (SD), Ministry of Development						
Sichuan University						
The Chinese University of Hong Kong (CUHK)						
Institute of Mountain Hazards and Environment (IMHE), Chinese Academy of Sciences (CAS)						
Indian Space Research Organization (ISRO)						
Symbiosis Institute of Geoinformatics (SIGI), Symbiosis International University (SIU)						
Mohammed Bin Rashid Space Centre (MBRSC)	✓	✓	✓	✓		
Indonesian National Institute of Aeronautics and Space (LAPAN)						
Center for Remote Sensing and Ocean Sciences (CRSOS) Udayana University						
Center of Technology for Natural Resources Inventory (PTISDA - BPPT)						

# Contents of SOP

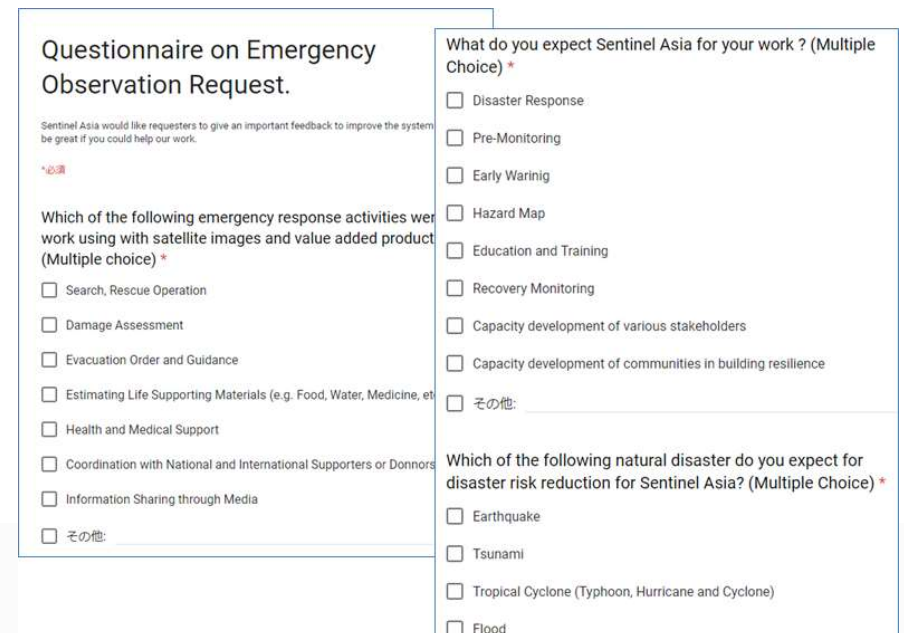
Contents of SOP is as:

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4. **Providing Disaster Information and Feedbacks**

Mobile APP and Questionnaire survey about your EOR is shown.



The screenshot shows the main interface of the GIC Disaster Survey mobile app. At the top left is the logo of the Asian Institute of Technology (AIT), established in 1959. To its right is the text "GIC Disaster Survey" with "Asian Institute of Technology" underneath. Below the header, there is a paragraph explaining the app's purpose: "The mobile app is developed to collect information on current disasters and its impact to important objects, properties, and infrastructures. The collected information will be useful for disaster response and post-disaster activities, including for the satellite-based disaster mapping Sentinel Asia." Below this is a request to "Please complete the following survey regarding disaster occurring in your area." At the bottom, there are two input fields for "Date/Time\*", with the first field containing "2/4/2021" and the second field containing "08:21 AM".



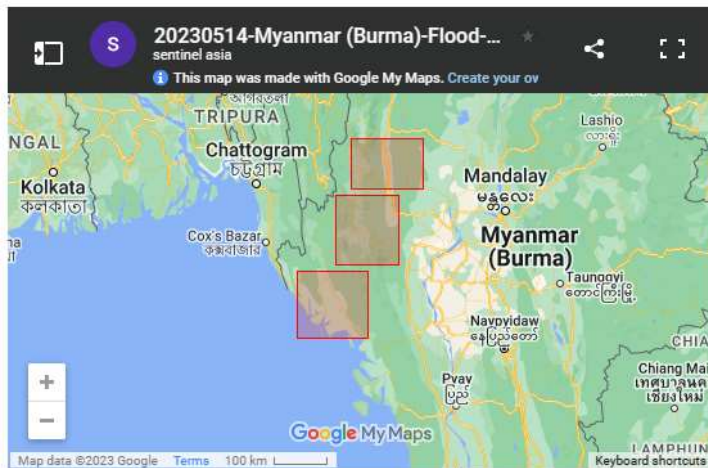
The screenshot shows a questionnaire titled "Questionnaire on Emergency Observation Request." It includes a note: "Sentinel Asia would like requesters to give an important feedback to improve the system, be great if you could help our work." Below this is a red asterisk indicating a required question: "Which of the following emergency response activities were you work using with satellite images and value added products (Multiple choice) \*". The options are: Search, Rescue Operation; Damage Assessment; Evacuation Order and Guidance; Estimating Life Supporting Materials (e.g. Food, Water, Medicine, etc.); Health and Medical Support; Coordination with National and International Supporters or Donors; Information Sharing through Media; and その他: (Other). To the right of this section is another question: "What do you expect Sentinel Asia for your work? (Multiple Choice) \*". The options are: Disaster Response; Pre-Monitoring; Early Warning; Hazard Map; Education and Training; Recovery Monitoring; Capacity development of various stakeholders; Capacity development of communities in building resilience; and その他: (Other). Below this is a third question: "Which of the following natural disaster do you expect for disaster risk reduction for Sentinel Asia? (Multiple Choice) \*". The options are: Earthquake; Tsunami; Tropical Cyclone (Typhoon, Hurricane and Cyclone); and Flood.

# Good Practice following SOP

2023-05-14

## Cyclone MOCHA in Myanmar on 14 May, 2023

### Emergency Obs. Request Information



Disaster Type: Storm

Country: Myanmar

Occurrence Date (UTC): 14 May, 2023

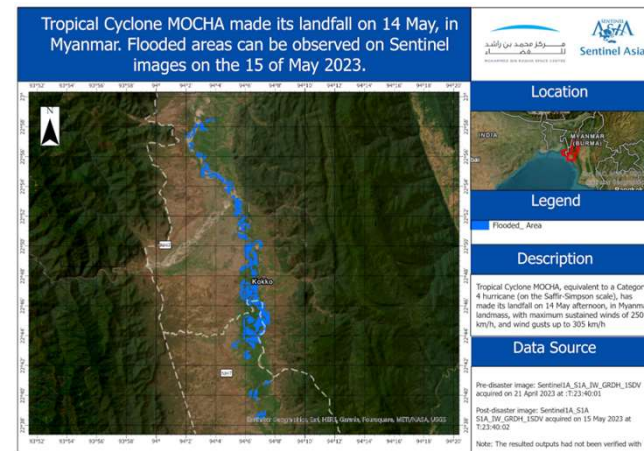
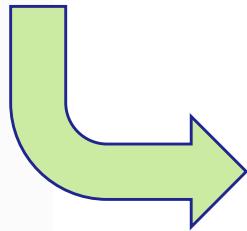
SA activation Date(UTC): 11 May, 2023

Requester: ASEAN Coordinating Centre for Humanitarian Assistance on disaster management (AHA Centre)

Escalation to the International Charter: Yes

GLIDE Number: TC-2023-000069-MMR

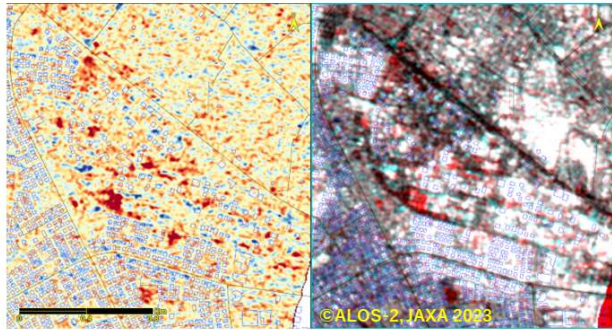
***EOR was activated before hitting in Myanmar***



SA confirmed a risk of cyclone MOCHA before hitting to Myanmar. ADRC made a EOR into OPTEMIS on behalf of AHA Center, following SOP.

# SOP for Nepal and Turkey (2023)

New SOP will be developed in Turkey and Nepal, in 2023.



Difference of backscatter intensity    Color composite    R: 2023/2/8  
G&B: 2022/4/6

## 2023 Turkey earthquake

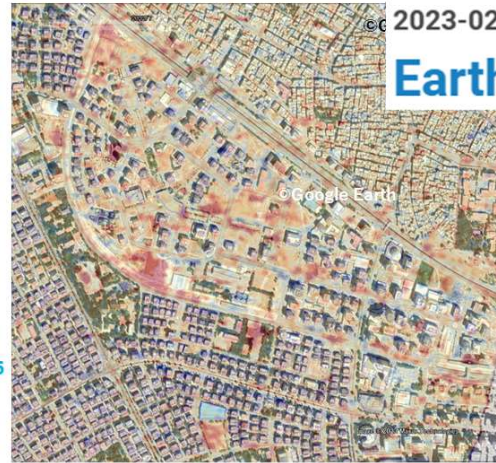
Location: Gaziantep City, Turkey

Sensors: ALOS-2 PALSAR-2

Comparison of backscatter intensity difference and color composite (HH polarization). Compared with the Google Earth, the backscatter intensity increased in many open spaces, which may be evacuation sites. The black lines are city blocks and blue polygons are buildings, downloaded from the OpenStreetMap. ALOS-2 images were owned by JAXA (6.25m/pixel).



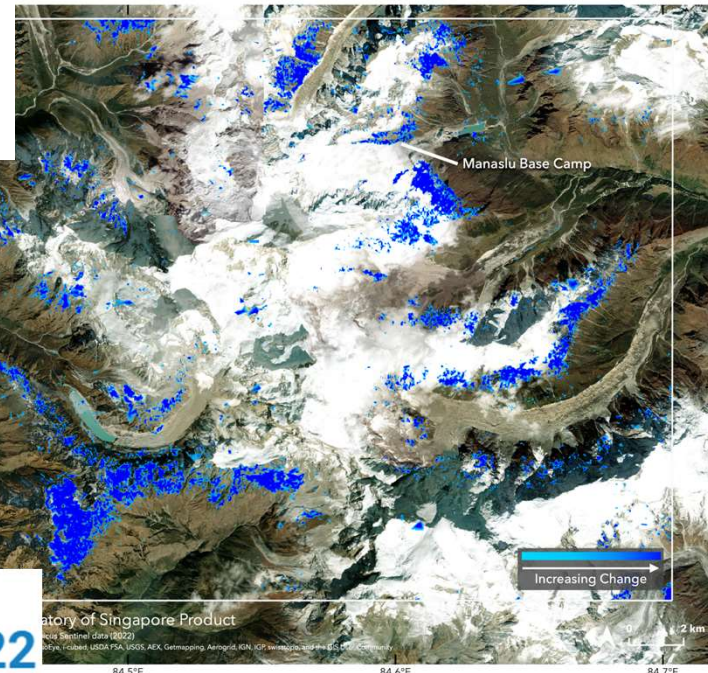
Location map



2023-02-06

## Earthquake in Turkey on 06 February, 2023

Difference of HH polarization over the Google Earth (2022/7/20)



EOS-RS Damage Proxy Map: Manaslu, Nepal, Avalanche, 5 Oct 2022, v0.4

The Earth Observatory of Singapore - Remote Sensing Lab (EOS-RS) created this preliminary Damage Proxy Map (DPM) depicting areas that are likely damaged on Manaslu, Nepal due to avalanches that occurred between 12 Sep 2022 and 5 Oct 2022. This map was derived from synthetic aperture radar (SAR) images acquired by the Copernicus Sentinel-1 satellites operated by the European Space Agency (ESA) before (30 Aug 2022 and 11 Sep 2022) and after (6 Oct 2022) the event.

The image covers an area indicated by the large white polygon. Each pixel measures about 30 meters across. The colour variation from light blue to dark blue indicates increasingly more significant surface change. Preliminary validation was done by comparing with media reports. This map could be used as a guidance to identify damaged areas, and may be less reliable over vegetated areas. Scattered pixels over vegetated areas may be false positive, and a lack of colored pixels over vegetated areas may not mean no damage.

The product contains modified Copernicus Sentinel data (2022), processed by ESA and analysed by the Earth Observatory of Singapore - Remote Sensing Lab (EOS-RS), using the Advanced Rapid Imaging and Analysis (ARI) system originally developed at NASA's Jet Propulsion Laboratory, California Institute of Technology, and modified at EOS-RS.

More map details and files at: [http://eosr-products.earthobservatory.sg/EOS-RS\\_202210\\_Nepal\\_Avalanche/](http://eosr-products.earthobservatory.sg/EOS-RS_202210_Nepal_Avalanche/)

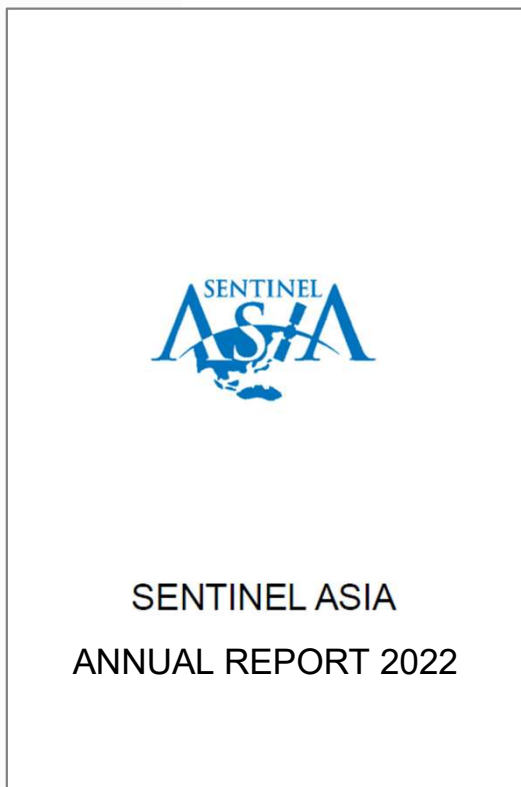
Credits: Earth Observatory of Singapore - Remote Sensing Lab (EOS-RS), Advanced Rapid Imaging and Analysis (ARI), NASA/JPL/CALTECH. Contains modified Copernicus Sentinel data (2022)

2022-10-02

## Manaslu avalanche in Nepal on 2 October, 2022

EOS-RS Twitter: @eos\_rs

# [Announcement]



## Sentinel Asia Annual Report 2023

Please submit your SA report in 2022.  
(to: [mi-ikeda@adrc.asia](mailto:mi-ikeda@adrc.asia))

- Emergency Observation Request
- Conference
- Your own DRR activity
- Training
- Internal meeting
- etc.

Sentinel Asia Activity Report in 2021

Center (ADRC)

onal conferences

IA Centre Executive (ACE) Programme, which  
ity. This webinar was held in an online format,  
and reported on the latest DRR technology transfers among related DRR organizations. ADRC gave  
a presentation that included the following case studies: (i) Outline of the Sentinel Asia, (ii) Trend of  
an Emergency Observation Request, and (iii) How to register disaster information into the OPTEMIS  
which is a system for making EOR.

Section on Sentinel Asia:  
"Space-based disaster risk management support for the benefit of the Asia-Pacific region"

Time (JST)	Agenda Item	Speaker/Moderator	Activities
15:00-15:05	Opening	Dr. Ramanathiyi Wimaladewa	opening and introduction of speakers
15:05-15:20	Keynote Presentation	Mr. MIYOSHI (Sentinel Asia Secretariat)	significance of space technologies for disaster management application on "Sentinel Asia" support from Japan-based JPF members including those who are not at the summit (membership, their personal roles)
15:20-15:40	Hands-on Session "Sentinel Asia Web-GIS"	Ms. TAKAKURA (JASA)	overview of Web-GIS based products (cooperation between a bare VAP and a VAP combined with Web-GIS)
15:40-15:50	How to make an Emergency Observation Request (EOR) to Sentinel Asia	Dr. BIKEDA (ADRC)	explanation on the flow of EOR how to make an EOR (including how to determine the AOT and OE in the Event) introduction to the simulation training program on EOR using Sentinel Asia's system "OPTEMIS" to be schedule on 19 November (from 16:30-18T) for those who are currently or might be responsible for making EORs
15:50-16:20	Extraction of building footprints from satellite data – theory and hands-on practice	Prof. MIYAZAKI (University of Tokyo)	workflows of building footprints for assessing damages caused by natural disasters general theory how to extract building footprints from satellite data demonstration of an application, followed by hands-on session using the application Sentinel Asia's plan for this initiative (including possible cooperation with NSRF) invitation for participants in the session to join this initiative (collab. prerequisites, terms and conditions as well)

**Deadline is 20 October 2023!!**