Disaster Resilience Week
Side Event
Celebrating two decades of Satellite Imagery Applications for Enhanced Disaster Resilience
Side Event with UN Satellite Centre (UNOSAT)

Celebrating two decades of satellite imagery applications for enhanced disaster resilience

26 August 2021
12:30-13:40 hrs. (UTC+7, Bangkok time)
Virtual, MS Teams

QR code and Registration:
https://forms.office.com/r/91RKYnhBEN
House Keeping Announcements

1. This meeting will be RECORDED.
2. Please MUTE your microphone when you are not talking.
3. Please TURN OFF your video, when not necessary, to save bandwidth.
4. Please TYPE the questions on the CHAT BOX.
5. Please RAISE HAND, if you would like to speak.
6. We will share the presentations later on.
Welcome and Introduction

Moderator

Mr. Khaled Mashfiq
Regional Liaison Officer
UNOSAT Asia-Pacific Regional Liaison Office
Speakers and Panelists

Opening Remarks

Ms. Tiziana Bonapace
Director
ICT and Disaster Risk Reduction Division, UNESCAP

Mr. Einar Bjørgo
Director
United Nations Satellite Centre, (UNITAR-UNOSAT)

Panelists

Ms. Raksina Lekthanoo
Chief, International Relations Division
Geo-Informatics and Space Technology Development Agency (GISTDA), Thailand

Mr. Shivanal Kumar
Climate Adaptation Specialist, Ministry of Economy, Fiji

Mr. Keran Wang
Chief, Space Applications Section
ICT and Disaster Risk Reduction Division, UNESCAP

Mr. Luca Dell’Oro
Chief, Disaster Risk Management and Climate Resilience Section
United Nations Satellite Centre, (UNITAR-UNOSAT)
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<tr>
<th>Time</th>
<th>Event</th>
<th>Organizer</th>
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<td>12:30-12:35</td>
<td>Welcome and Introduction</td>
<td>Khaled MASHFIQ (UNOSAT)</td>
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<td>12:35-12:40</td>
<td>Remarks by UNESCAP</td>
<td>Tiziana Bonapace Director, ICT and Disaster Risk Reduction Division, UNESCAP</td>
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<td>12:40-12:45</td>
<td>Remarks by UNOSAT</td>
<td>Einar Bjørgo Director, United Nations Satellite Centre (UNOSAT), UNITAR</td>
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<td>12:45-13:05</td>
<td>Presentations by Panelists (each 5 min.)</td>
<td>Panelists: Thailand, Fiji, UNESCAP, UNOSAT</td>
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<td>13:05-13:30</td>
<td>Questions and Answers session</td>
<td>From audience to panelists and speakers</td>
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<td>13:30-13:40</td>
<td>Wrap up and Closing Remarks</td>
<td>UNESCAP (Keran Wang) UNOSAT (Luca Dell’Oro)</td>
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Remarks by UNESCAP

Tiziana Bonapace
Director, ICT and Disaster Risk Reduction Division
UNESCAP
Remarks by UNOSAT

Einar Bjørgo
Director
United Nations Satellite Centre (UNOSAT), UNITAR
Panel Discussion
Guiding questions

1) What are past achievements and future perspectives in the use of satellite imagery for disaster risk management?

2) How can digital innovations and modern technologies like big data analytics, and AI be practically used and adapted in countries that are not tech leaders to solve complex problems related to disaster resilience and sustainable development?

3) What challenges need to be addressed and what are the recommendations to enhance regional cooperation to address these challenges?
Panelist Presentation

Ms. Raksina Lekthanoo
Chief, International Relations Division
Geo-Informatics and Space Technology Development Agency (GISTDA), Thailand
Celebrating two decades of satellite imagery applications for enhanced disaster resilience

Raksina Lekthano, GISTDA
26 Aug. 2021
GISTDA: Delivering Values from Space

- Earth observation satellite operation
- Infrastructure for space innovation and industry development
- Enhancement of space manpower in Thailand
- National space committee and national space representatives
- Space Technology development
- Applications/Solutions for sustainability
GI for All
MoU on Operational Satellite Applications between UNITAR - GISTDA
Panelist Presentation

Mr. Shivanal Kumar
Climate Adaptation Specialist
Climate Change & International Cooperation Division
Ministry of Economy, Fiji
Panelist Presentation

Mr. Keran Wang
Chief, Space Applications Section
ICT and Disaster Risk Reduction Division, UNESCAP
Celebrating two decades of satellite imagery applications for enhanced disaster resilience

Strengthen regional cooperation on integration of geospatial information for building back better

Mr. Keran Wang
Chief
Space Applications Section
Regional Space Plan of Action: from paper to actions

188 Actions for 37 Targets of 14 SDGs + SFDRR
Space applications support response to COVID-19

- Acquisition of geospatial data from multiple sources, including high-resolution satellite data
- Platforms, dashboards, maps to track, trace, monitor and map real-time geo-referenced data of COVID-19
- Social distancing, tracking and tracing of potentially infected individuals
- Statistical analysis to identify sources of infection and show the impact of policies
- Crowdsourcing information with geotagging and volunteered geographical information
- Disaster risk resilience during the pandemic
- Analyzing distribution and availability of food and medical supplies
- Identifying and helping vulnerable communities and at-risk populations
Integrating geospatial information to tackle problems in building back better and achieving SDGs

One Data
Land Department Division
Health Ministry
Statistical Bureau
Space Agency
Local government

One Map
Same Location
Land Use
COVID-19 cases
Population
Satellite Image
Ground data

One Platform
Same Time
Knowledge products: from manuals to real experiences

- Through our long-standing RESAP network, ESCAP promotes the application of space technology and geographic information systems (GIS) for disaster risk reduction and inclusive and sustainable development.
- Various publications and knowledge products.
- Partners: UN-GGIM, UNOSAT, MGA, ARTSA, CSSTEAP, GEO&AOGEO, UN-SPIDER, SCOSA, CEOS, WMO, SPC, APRSAF, APS, ADPC, AIT, SPC, RIMES, ADRC, IMWI and universities in Asia and the Pacific.
Timely provision of satellite imagery for disaster management

- The secretariat has provided over 50 reports and 45 gigabytes of satellite imagery and products to member States for early warning, response and damage assessment relating to various climate hazards, through the RESAP network and collaboration with the UNOSAT.

- Member States shared space-based data, products and services free of charge through partnerships with other UN agencies and international/regional initiatives.

- ESCAP will collaborate with UNOSAT in AI for flood early warning and management.
Capacity Building: from the classroom to the field

- The secretariat also implemented capacity-building activities by integrating geo-referenced data from the ground, air, space, and crowdsourcing.
- Through human, financial and technical resources from China, India, Indonesia, Japan, the Republic of Korea, the Russian Federation and Thailand, the secretariat organized 33 physical and online thematic trainings, attended by over 1,000 participants.
- The secretariat will continue facilitating the participation of a number of officials in various post-graduate courses and degree programs on space applications and geo-informatics in CSSTEAP and ARTSA.
Addressing drought: from space and ground

Regional Drought Mechanism to improve the use of integrated geospatial and field data for drought monitoring, early warning and response

<table>
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<th>The Drought Mechanism</th>
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<tr>
<td><strong>Four main components</strong></td>
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<td>Regional Service Nodes</td>
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**How it all works**

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<th>Key Steps</th>
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<td>How it all works</td>
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<tr>
<td>Monitoring</td>
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<td>Capacity building in space and GIS</td>
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<td>Provide satellite imagery and products</td>
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<tr>
<th>How it all works</th>
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<tr>
<td>Space-based information</td>
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<td>Government agencies analyse and share space-based information</td>
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<td>Technical feedback</td>
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<td>Agricultural community responds accordingly to minimize the effects of drought</td>
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<td>Early action</td>
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<td>National institutions perform soil and moisture analysis</td>
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<td>Early warning and timely relief measures</td>
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<tr>
<td>Knowledge transfer</td>
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<td>Networks share knowledge and good practices</td>
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<td>Knowledge feedback</td>
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<td>Experts provide feedback on the scientific and technical methodology and procedures</td>
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Monitoring air pollution in Asia from space

Geostationary Environment Monitoring Spectrometer (GEMS) is a UV-visible spectrometer to monitor air pollutants (O3, NO2, SO2, HCHO, CHOCHO, and aerosols) at an unprecedented spatial and temporal resolution from a geostationary Earth orbit.
Resilient agriculture in the Lower Mekong Basin

- Develop a crop monitoring system combining ground-based information with satellite data
- Build awareness and capacity of government officials to utilize the system and innovative technology
- Contribute to the implementation of the regional Space Plan of Action (2018-2030), and food security at the national and provincial levels.
Innovative tools for plastic pollution monitoring

Remote sensing

Crowdsourced data from ground

Mobile phone

Drone

Space station

Satellite

Time lapse camera

RIVER

Cloud computing

Data analysis
SPACE+ for our future Earth

Geospatial data should be Accessible, Available, Actionable and Affordable to benefit People and inform Practices, Processes and Policies.
SPACE+ for our future Earth

- Data has value, the value can be measured
- Data+location+time (What, Where, When) allows interoperation (Why and How) of the data from difference sectors
Panelist Presentation

Mr. Luca Dell’Oro
Chief, Disaster Risk Management and Climate Resilience Section
United Nations Satellite Centre, (UNITAR-UNOSAT)
Evidence-Based Information support for enhanced disaster resilience using Satellite Imagery and Geospatial Technologies

Luca Dell’Oro (Mr.)
Chief, Disaster Risk Management and Climate Resilience Section
United Nations Satellite Centre (UNOSAT)

Side Event with UNESCAP – “UNOSAT - Celebrating two decades of satellite imagery applications for enhanced disaster resilience”

Thursday, 26 August 2021
Outline

• Innovations in Earth Observation and Geospatial Technologies from pixels to customized added value services

• UNOSAT Rapid Mapping: AI based flood detection tool (2021 monsoon season monitoring)

• UNOSAT capacity development: enhancing decision making through innovative learning solutions and geospatial support services

• NORAD project overview (2021-2023)
Innovations in Earth Observation and GIT: from pixels to customized added value services

New Age of Satellite Imagery – Driving Factors:

- **Exponential growth of satellite sensors**: more orbiting satellites means more data and applications;

- **Cost effectiveness**: Faster and cheaper launches mean more satellites in space and at a much cheaper cost;

- **Sensor advancements**: higher spatial resolution (i.e. 30 / 15 cm) and reduction in revisit time: some constellations are capable of covering the Earth several times a week;

- **Shift from data to analytics**: Big Data and Cloud Processing technologies allows a huge amount of data to be not only stored but also analyzed online. More companies are offering value-added services;

- **Rise of AI/ML**: have proved to be a powerful tool for analyzing satellite imagery and proving faster and more insights about economic, social and environmental processes at different scale.
UNOSAT AI-based Flood Detection Tool: End-to-end AI model pipeline

**Area of interest**
- Automatic Downloading

**UNOSAT FloodAI Model**
- Fine tuning and model update
- AI output: daily cumulative flood extents (.shp)
- Quality Control
- Human Validation
- Human-in-the-loop (HITL)

**Flood Rapid Mapping**
- Hosted at CERN

**Application of new technologies to real world situations and knowledge transfer**
- BIG DATA
- AI / ML Algorithms
- SOLUTION
- NEW TECHNOLOGY

**Satellite Imagery Provider**
- Near-Real-Time Automatic Monitoring

**UNOSAT AI-based Flood Detection Tool**
- End-to-end AI model pipeline

**UNOSAT FloodAI Model**
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**Flood Rapid Mapping**
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**Application of new technologies to real world situations and knowledge transfer**
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- SOLUTION
- NEW TECHNOLOGY
UNOSAT AI based Flood Detection Dashboard: Monsoon Season Monitoring, Asia (June-Aug 2021)
UNOSAT’s knowledge and technology transfer activities

**Capacity development activities**

- **Open data services**
- **Data sharing mechanisms**

**Organisational Affiliation**
- 47% National Governments
- 23% Academic Institutions
- 20% UN Agencies
- 10% RO, INGOs and others

**Beneficiaries 2010-2021 (Capacity Development)**
- 3000+ Learning events
- 8000+ Knowledge sharing events

**Basic & Advanced Courses**
Use of satellite imagery for human security, emergency response mapping and strategic spatial planning

**Workshop & Information Sharing Sessions**
Use of geospatial information technologies for decision makers

**In-Country Capacity Building**
To strengthen local capacities in the use of satellite imagery for disaster risk management and spatial planning

**Open Data Services**
To inform policies, planning and decision making

**Data Sharing Mechanisms**
For wider distribution of satellite derived analysis through HDX, GDACS and UN other platforms.
Norad Project (2021-2024) – Overview

With financial support from the Norwegian Agency for Development Cooperation - Norad, UNOSAT will:

- Further develop technical and institutional capacities of governmental officials in selected countries on the use of geoinformation technologies;

- Expand the reach of the programme both geographically and thematically by developing new GIT applications to tackle disaster risk but also environmental degradation, food security, and resilience in a changing climate

Questions and Answers session

- Please post your questions using the chat box, mention your name, organisation and also mention who is the question for.

- If you would like to speak please raise your hand, our team will try to give you floor as soon as possible. By default your audio and video maybe disabled.

- We will try to accommodate as many questions as possible but due to time constraints we would reply unanswered question separately via email.
Wrap up and Closing Remarks

ESCAP & UNOSAT
Feedback

Your feedback is really valuable to us! Please use the below link to fill up a short questionnaire.

https://forms.office.com/r/LaZ0P87tR4
How to reach us?

Space Applications Section (SAS)
Information and Communications Technology and Disaster Risk Reduction Division (IDD)
United Nations Economic and Social Commission for Asia and the Pacific (ESCAP)
Email: escap-sas@un.org

United Nations Satellite Centre (UNOSAT)
Regional Office in Bangkok
United Nations Institute for Training and Research (UNITAR)
Email: unosat.bangkok@untar.org

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