Use of Earth Observation to Strengthen Disaster Risk Management for Sustainable Development in Asia and the Pacific

Mr. Hamid Mehmood

Economic Affairs Officer, Space Applications Section
ICT and Disaster Risk Reduction Division of ESCAP
Hamid.mehmood@un.org

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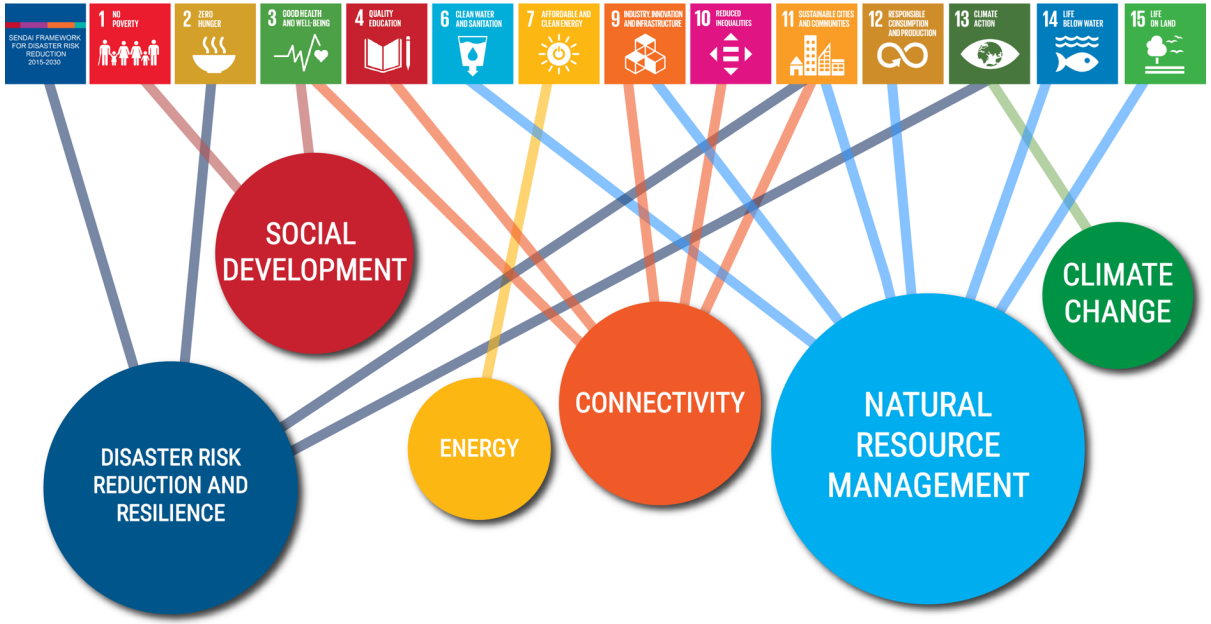
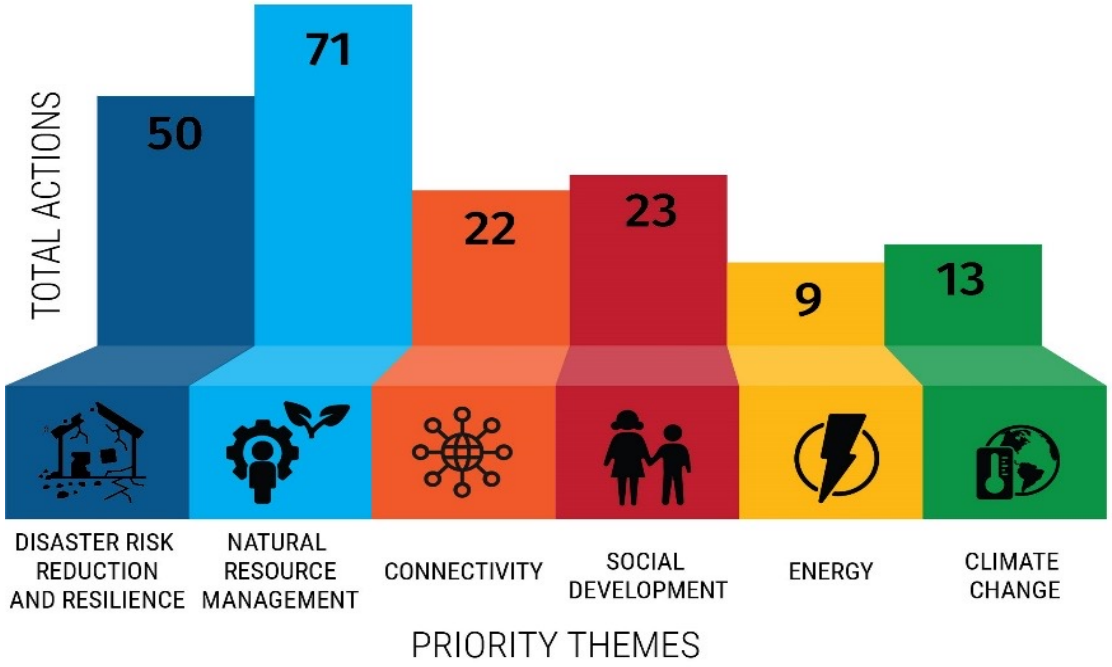
Asia-Pacific Plan of Action on Space Applications for Sustainable Development (2018–2030)

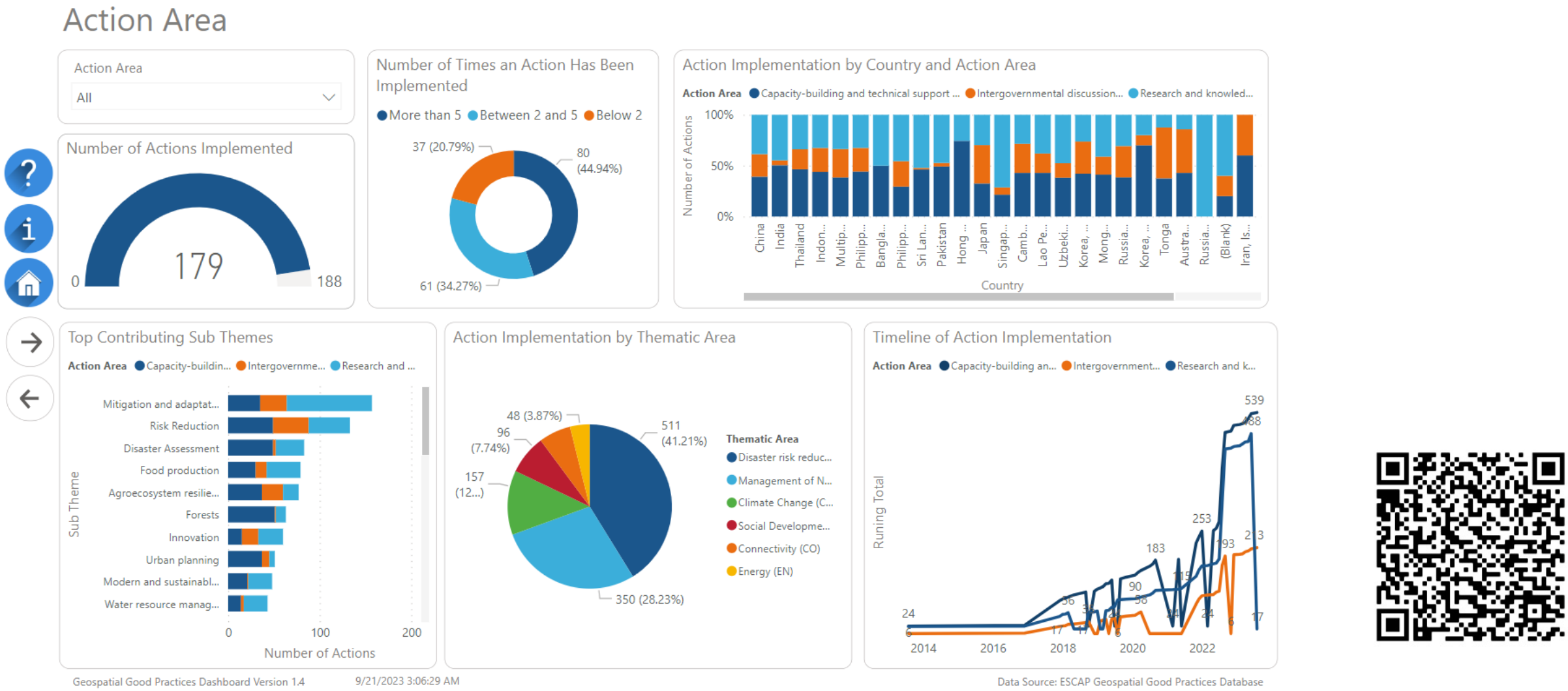




Outcome of the 4th Ministerial Conference on Space Applications

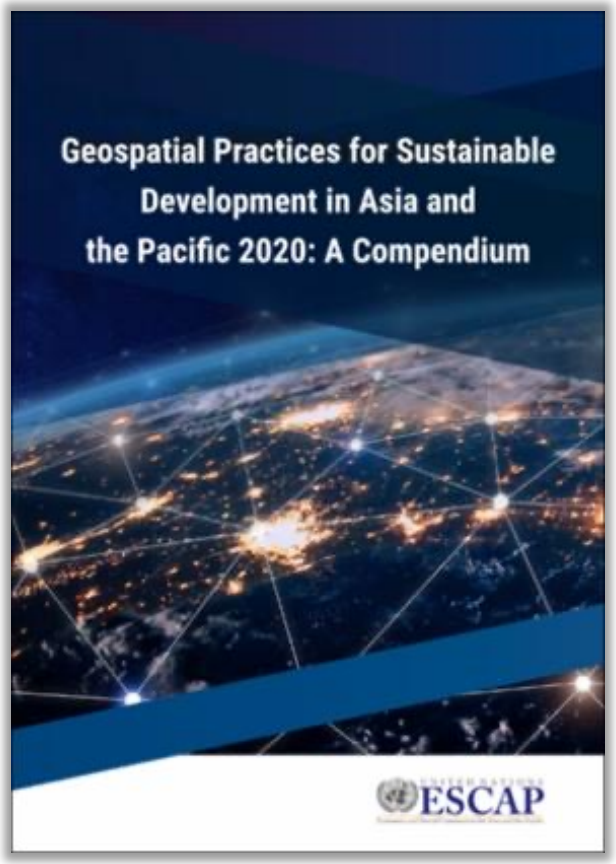
Wednesday, 26 October, 2022

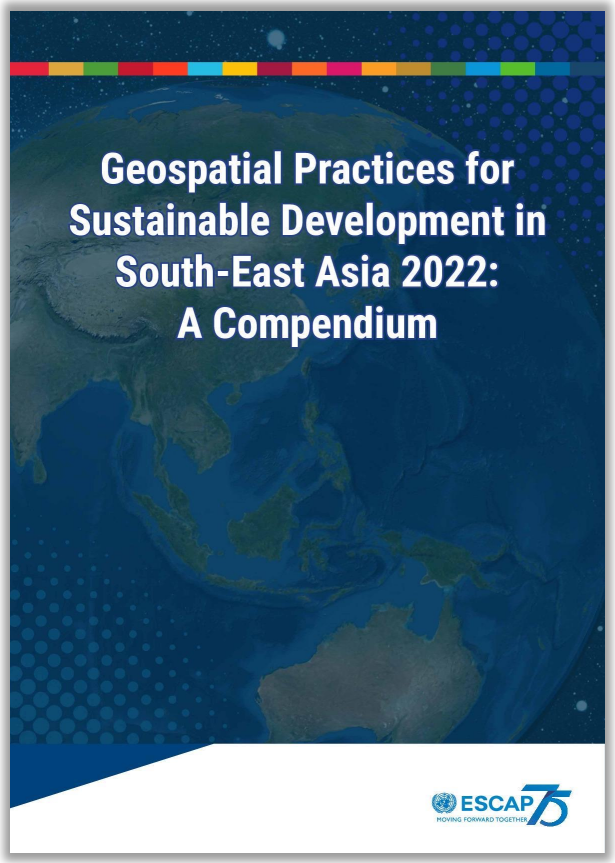
Geospatial good practices database and dashboard



Innovative geospatial information applications for disaster resilience and sustainable development

Compendium series: sharing knowledge and experience





Geospatial Practices for Sustainable Development in East and North-East Asia 2024: A Compendium

Chapter 1. The context of space applications for sustainable development in East and North-East Asia

Chapter 2. Good practices for using geospatial information

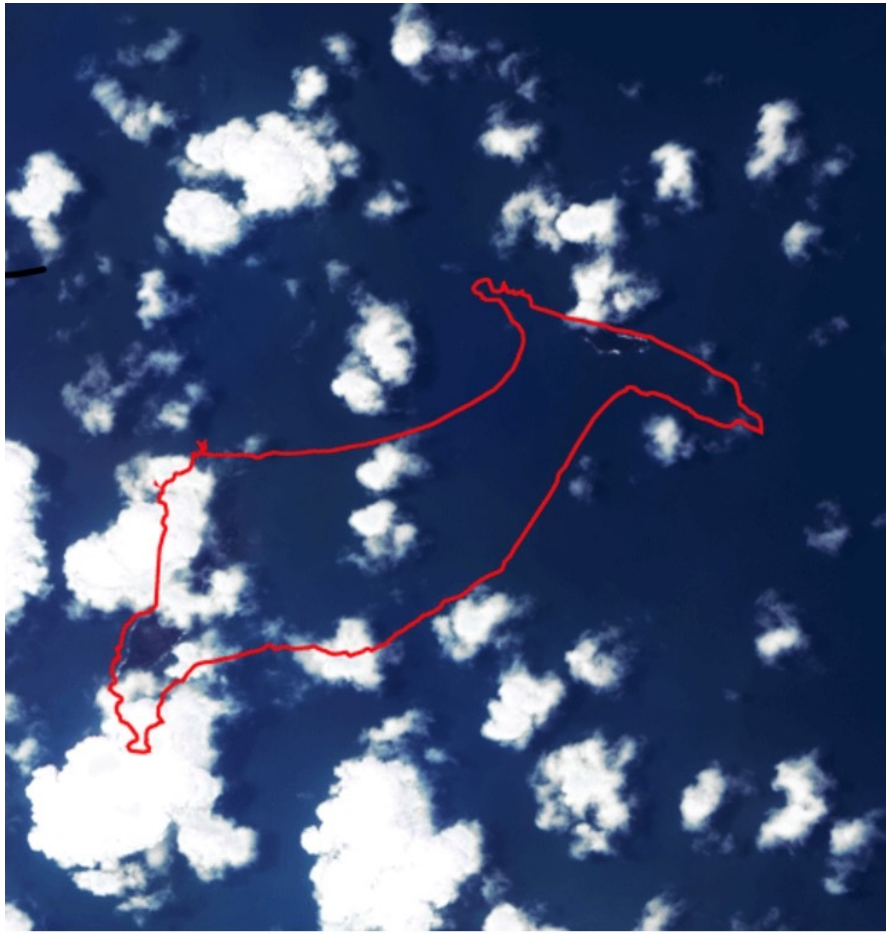
Chapter 3. Special topic: Leveraging digital innovations to promote geospatial information

Chapter 4. Trends and evolving subregional needs

Chapter 5. Policy recommendations

Timely provision of satellite imagery for disaster management

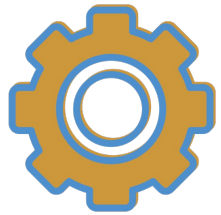
- On average, the secretariat provides over 40 reports and 150 gigabytes of satellite imagery and products to member States for early warning, response and damage assessment relating to various climate hazards, through the RESAP network and collaboration with the UNITAR/UNOSAT, UN-SPIDER and APRSAF.
- 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 UNITAR/UNOSAT in AI for flood early warning and management.
- ESCAP will also work with UNU on flood and drought mapping through the use of integrated geospatial information.



Virtual Satellite Constellation for Disaster Risk Management (VSC)

The VSC will develop a mechanism for sharing satellite imagery within Asia and the Pacific to build resilience in disaster risk hotspots

Develop a satellite imagery sharing mechanism for enhanced pre-disaster monitoring of risk in high disaster - low risk countries



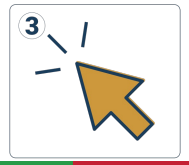
Improve the capacity of local governments and disaster management-related agencies to be prepared and manage disasters over their entire cycle

Provide inputs to the spacefaring nations on the design of future satellites and sensors which address national and regional data needs

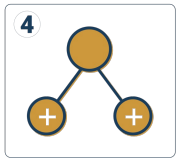
1 **Set up an informal working group** to work out the operational details and conduct a study to map free and commercial remote sensing data providers and share the catalogue with all member States.

2 **Invite spacefaring countries** to set aside a percentage of their satellite operational time or data archive for use by high disaster-risk and low-capacity countries.

3 **Invite target countries** to identify disaster risk hotspots for satellite imaging.



4 **Match support and demand** for satellite data by the secretariat using the VSC Catalog and form a working group to facilitate data transfer.



5 **Provide technical assistance** to the target countries in hosting, storing, processing and analysing the satellite data.

6 **Share the data requests** with all the spacefaring nations to ensure that the regional needs are addressed in future satellite and sensor design.

7 **Contribute to the Asia-Pacific Plan of Action on Space Applications for Sustainable Development (2018–2030) in the areas of:**

Disaster Risk Reduction and Resilience

Social Development

Management of Natural Resources

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Leverage digital innovations to accelerate implementing the regional space Plan of Action

Disaster Risk Hotspot Mapping

Use Big Earth Data, Cloud Computing and AI to decrease the cost and time to generate disaster risk hotspots in Asia and the Pacific.

We are working with countries and cooperation partners to build an ARRAY of tools and apps to address the data and information needs in Asia and the Pacific

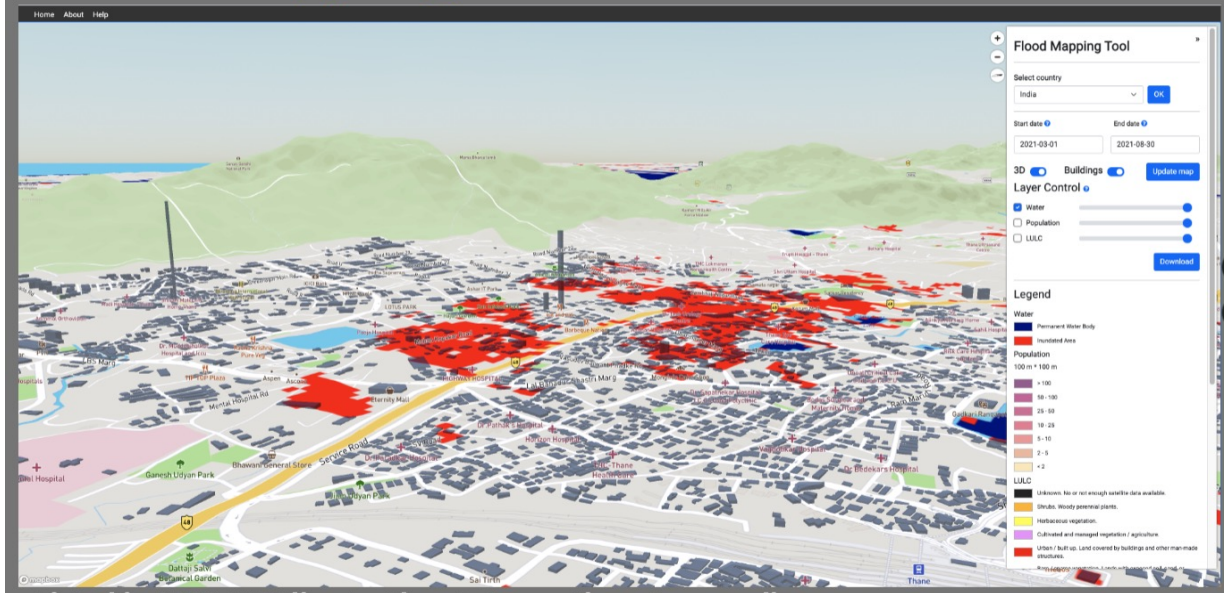
2023

Flood Hotspot Mapping

Wildfire Hotspot Mapping

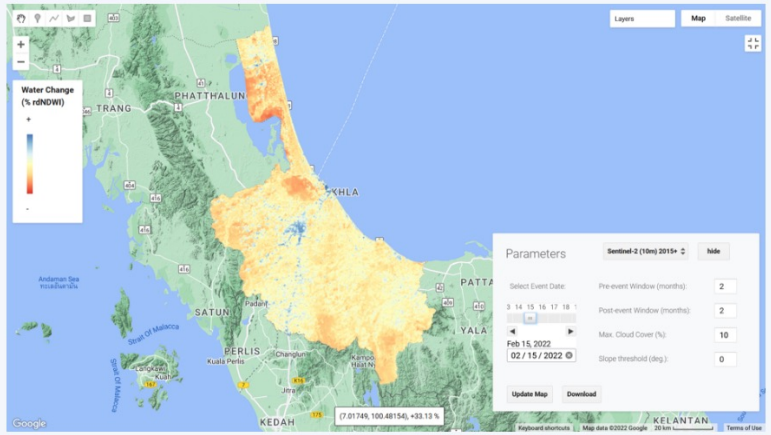
2026

Flood Mapping Tool (floodmapping.inweh.unu.edu)



- Listed in 2022 UN Climate Change Innovations Compendium
- Won the 2021 Popular Science Best of Whats New Award

Massive Open Online Courses (wlc.un.edu)



Active and Passive Satellite Data Analysis Using Cloud Computing for Surface Water/Flood Mapping

This online course introduces the participants to Earth Engine Code Editor platform and implementation of surface water detection algorithm using passive and active remote sensing.

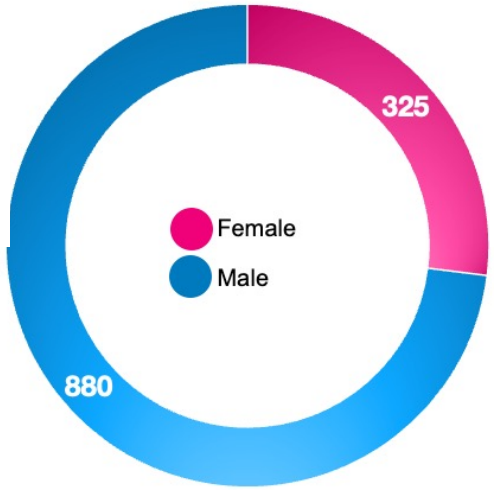
Enroll Now

Total number of participants **1205**

Reporting date: 21 April 2023
Course launch date: 28 December 2022

Completion rate 23%

Pariticipants from Cambodia **07**



Spatiotemporal Drought Assessment by Leveraging Google Earth Engine Platform

This online course introduces the participants to Earth Engine Code Editor platform and the implementation of drought detection and monitoring algorithm using passive and active remote sensing.

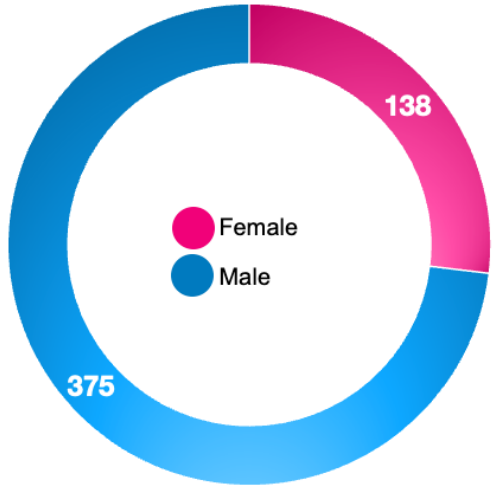
Enroll Now

Total number of participants **513**

Reporting date: 21 April 2023
Course launch date: 28 December 2022

Completion rate 19%

Pariticipants from Cambodia **03**



Participants are from universities, research institutes, and government agencies.

Massive Open Online Courses (wlc.un.edu)

New Course Launch:

Spatiotemporal Drought Assessment by Leveraging Google Earth Engine Platform (Russian)

Course Start: 01 August 2023

Пространственно-временной анализ засухи с использованием платформы GEE

Этот онлайн-курс знакомит участников с платформой редактора кода Earth Engine и реализует алгоритм обнаружения и мониторинга засухи с использованием пассивного и активного дистанционного зондирования.

View Course

Course Start
Aug 01, 2023

Course End
Aug 01, 2026

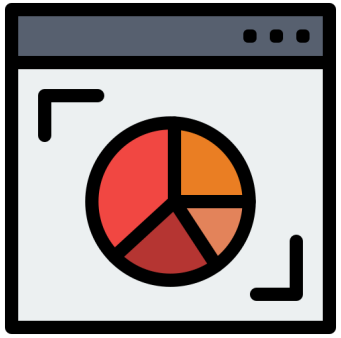
Duration
Undefined

Certificate
Yes

Leverage the power of Large Language Models (LLMs) to develop an open-access platform to better monitor and manage disaster risks_SatGPT

Label images: LLMs will be used to label images with relevant information, such as the type of disaster, the extent of the damage, and the number of people affected.

Classify data: LLMs will be used to classify remote sensing data, such as distinguishing between different types of disasters or different levels of damage.



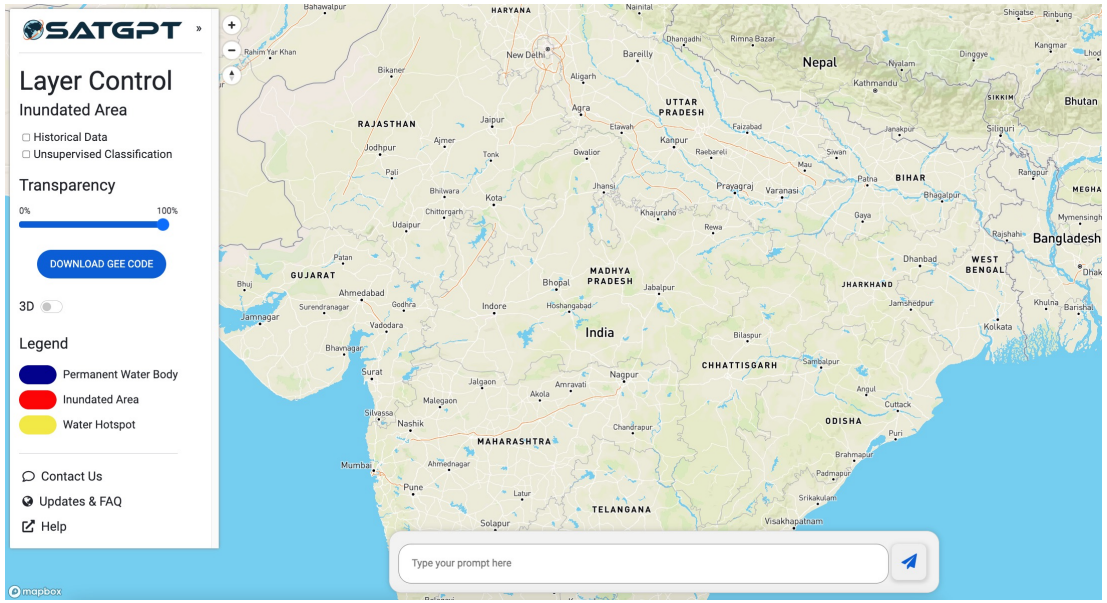
Generate reports: LLMs will be used to generate reports that summarize the findings of remote sensing data analysis and integrate sectoral data to aid decision-making and policy formulation.

Extract features: LLMs will be used to extract features from remote sensing data, such as the location of a disaster, the severity of the damage, and the risk of future disasters.

These functionalities will help generate the following information in a disaster management cycle.

- Identify and track natural hazards in real-time.
- Assess the risk of disasters.
- Warn people about impending disasters.
- Help people to prepare for and respond to disasters.
- Assess the damage caused by disasters.
- Identify the needs of affected communities.
- Prioritize resources for disaster recovery.
- Monitor the progress of recovery efforts.

The potential users include:



- Disaster Management Agencies
- Government Departments and Ministries
- Research Institutions and Scientists
- Non-Governmental Organizations (NGOs) and Humanitarian Agencies
- International Organizations and Donor Agencies
- Public and General Users

Massive Open Online Courses (wlc.un.edu)

New Course Launch:

Introduction to Geospatial Data Analysis with ChatGPT and Google Earth Engine

Course Start: 08 Dec 2023

Introduction to Geospatial Data Analysis with ChatGPT and Google Earth Engine

This online course introduces the participants to ChatGPT and Earth Engine Code Editor platform to process and interpret geospatial data.

View Course

Course Start
Dec 18, 2023

Course End
Dec 31, 2024

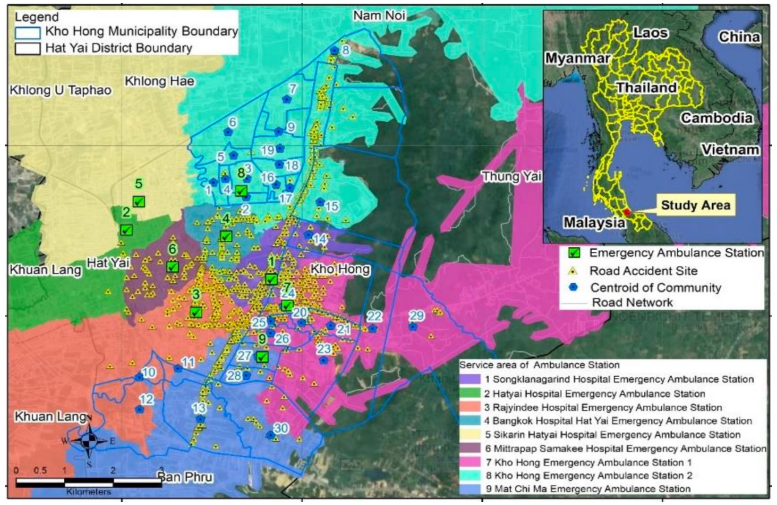
Duration
10 hours

Certificate
Yes

Building institutional capacity for the use of integrated spatio-temporal data in local SDGs monitoring and decision-making

Objective: To increase the use of integrated spatio-temporal and statistical data for local SDG monitoring and decision-making.

Outcome: Enhanced institutional capacity of national geospatial information applications agencies, and local governments in target countries, to utilize integrated spatio-temporal and statistical data for local SDG monitoring and decision-making



BRIN BADAN RISET DAN INOVASI NASIONAL

GISTDA

PSU PRINCE OF SONGKLA UNIVERSITY

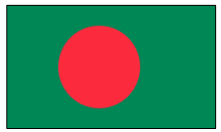
UN-GGIM-AP REGIONAL COMMITTEE OF UNITED NATIONS GLOBAL GEOSPATIAL INFORMATION MANAGEMENT FOR ASIA & THE PACIFIC

Hunan University of Science and Technology

Building the Pan-Asia Partnership for Geospatial Air Pollution information

Objective: To enhance the capacity of government agencies in target countries to strengthen national level air pollution monitoring and management.

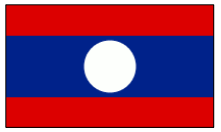
Outcomes: Access to and utilize space applications to monitor and introduce measures to improve air quality; Enhance capacity to utilize remote sensing data for air pollution monitoring; Engage in cooperative dialogue; Support evidence-based decisions for improving national and subregional air quality.



Bangladesh
SPARRSO

Cambodia
MoE

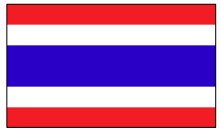
Indonesia
BRIN



Lao PDR
MONRE

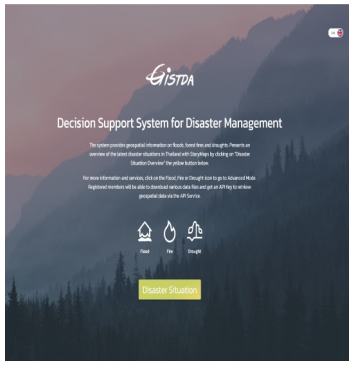
Mongolia
IRIMHE

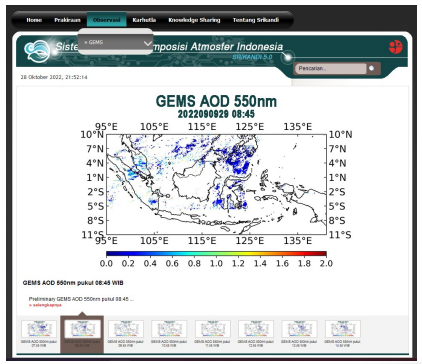
Philippines
PhilSA



Thailand
GISTDA

Viet Nam
MONRE





Subject Area	#	Member States
Space	4	BG, IN, PH, TH
Envir.	4	KH, LA, MN, VT

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Building resilient agricultural practices by integrating geospatial information for agricultural monitoring in the Lower Mekong Basin

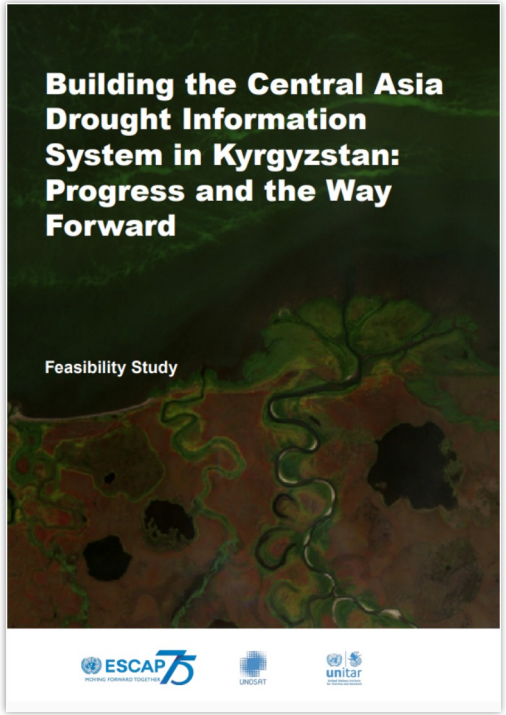
Objective: To strengthen the capacity of the lower Mekong countries to implement the recommendations contained in the Asia-Pacific Plan of Action on Space Application for Sustainable Development 2018-2030 particularly those related to disaster risk management, natural resource management and climate change.

Outcome: Government officials at the national and sub- national levels use the cloud-based crop monitoring system for the effective development of climate resilient agricultural practices in rice crop production.

Central Asia Drought Information System (CADIS) Pilot Project

Objective: To strengthen the capacity of target Central Asian countries to use satellite data and geospatial information for effective drought monitoring and early warning.

Outcome: Target Central Asian countries use the pilot drought information system for drought monitoring and early warning.



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