

**** August 2021 News from the Sentinel Asia Project Office ****

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1. [News] Additional Information on Typhoon Fabian in the Philippines and on Flood in Myanmar
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5. Using Sentinel Asia Operation System, OPTEMIS

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1. [News] Additional Information on Typhoon Fabian in the Philippines and on Flood in Myanmar (The outline was given in the July 2021 Newsletter)

(1) Typhoon Fabian in the Philippines (GLIDE Number: FL-2021-000091-PHL)

Typhoon Fabian (In-fa) hit the Philippines and caused heavy rain. According to FloodList, over 80,000 people had to evacuate their homes in the Philippines after severe weather brought by the southwest monsoon, was further intensified by Typhoon Fabian. At least three people had died and five had been injured as a result of falling trees or lightning strikes.

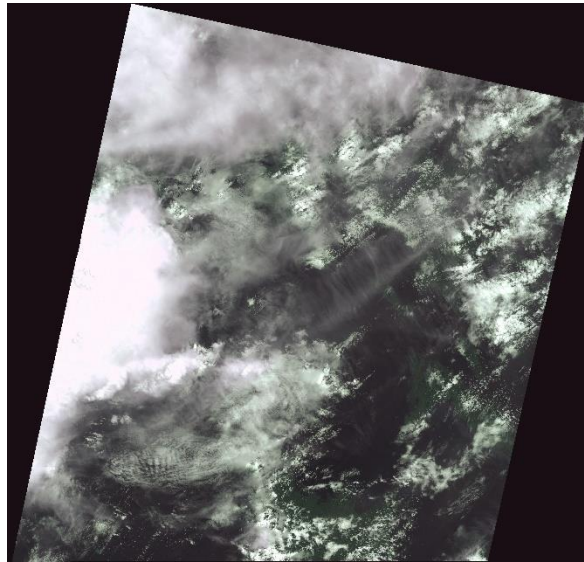
<https://floodlist.com/asia/philippines-floods-typhoon-infa-july-2021>

The Manila Observatory (MO) made an EOR to Sentinel Asia on 25 July. Among Data Provider Nodes (DPNs), the Geo-Informatics and Space Technology Development Agency (GISTDA), the Indian Space Research Organization (ISRO), the Japan Aerospace Exploration Agency (JAXA) and the National Applied Research Laboratories (NARL) provided observation data. Among Data Analysis Nodes (DANs), the Asian Institute of Technology (AIT) provided their Value Added Products (VAPs). Information on the latest responses by Sentinel Asia is available from the following link:

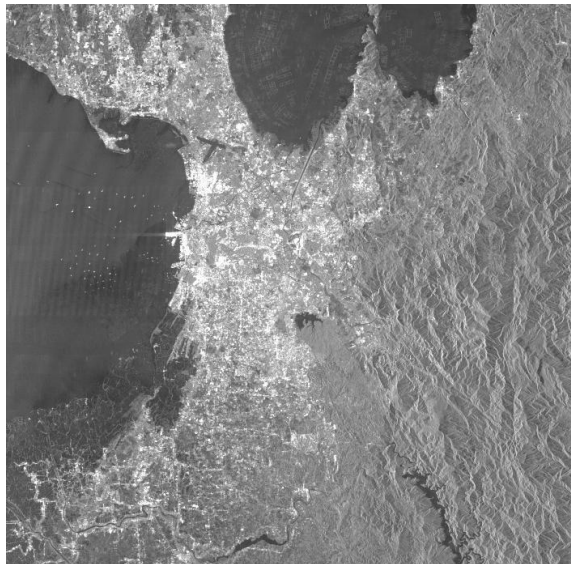
<https://sentinel-asia.org/EO/2021/article20210725PH.html>



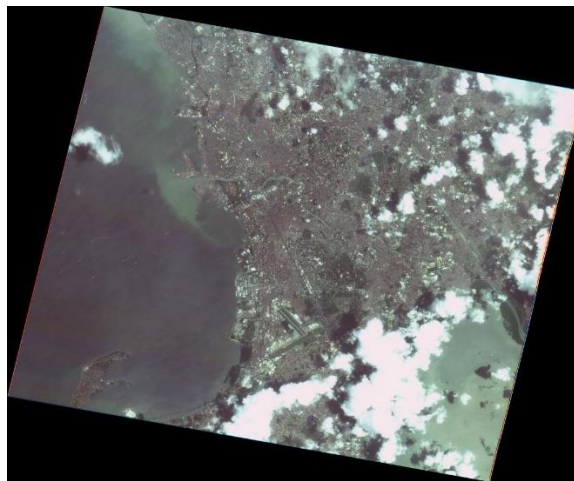
Satellite image (THEOS1) provided by GISTDA



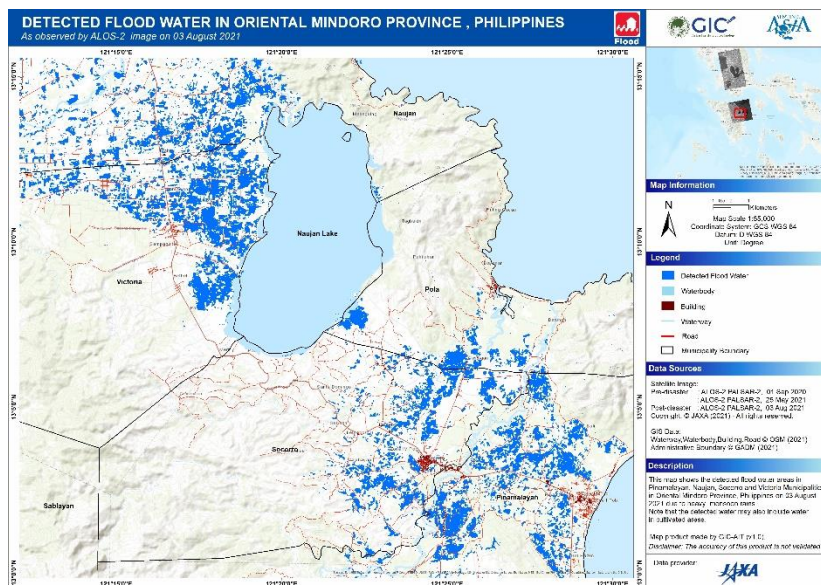
Satellite image (Resourcesat-2) provided by ISRO



Satellite image (ALOS-2) provided by JAXA



Satellite image (FORMOSAT-5) provided by NARL



Value Added Product by AIT

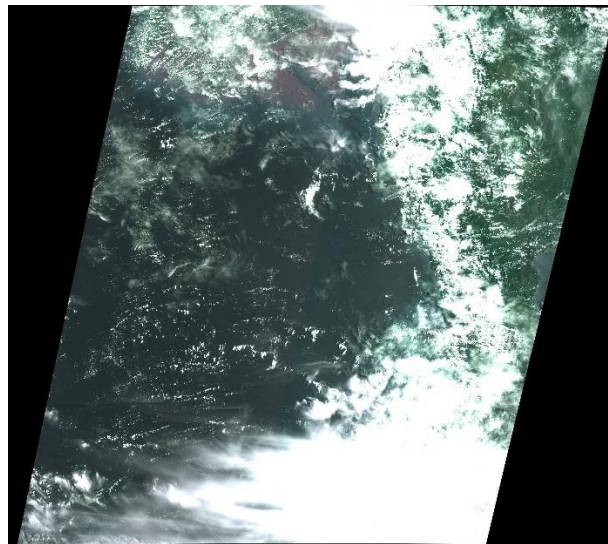
(2) Flood in Myanmar (GLIDE Number: FL-2021-000095-MMR)

A flood occurred in Myanmar on 26 July. The Radio Free Asia reported that heavy rains battered the southern states of Kayin and Mon and Tanintharyi region beginning on 25 July, impacting as many as 3,000 people. More than 100 people from Hlaingbwe in the state of Kayin had to evacuate, according to a relief official from the area.

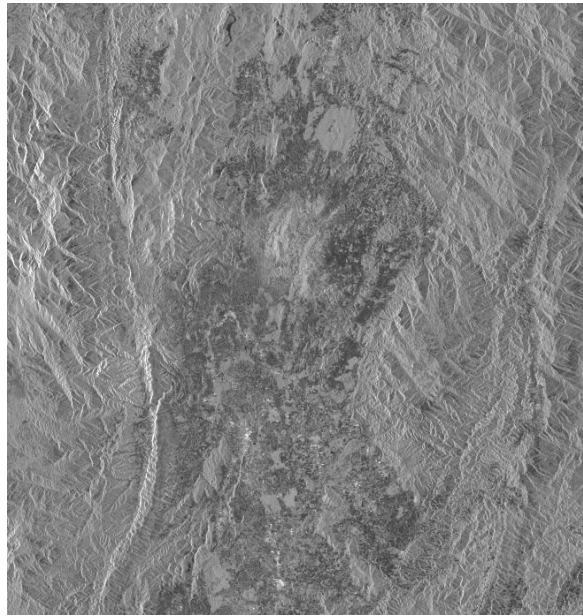
<https://www.rfa.org/english/news/myanmar/flooding-07262021205343.html>

The ASEAN Coordinating Centre for Humanitarian Assistance on disaster management (AHA Centre) made an EOR to Sentinel Asia on 27 July. Among DPNs, ISRO and JAXA provided their data. In addition, GISTDA and NARL also planned to provide their data. Among DANs, AIT provided their VAPs. Information on the latest responses by Sentinel Asia is available from the following link:

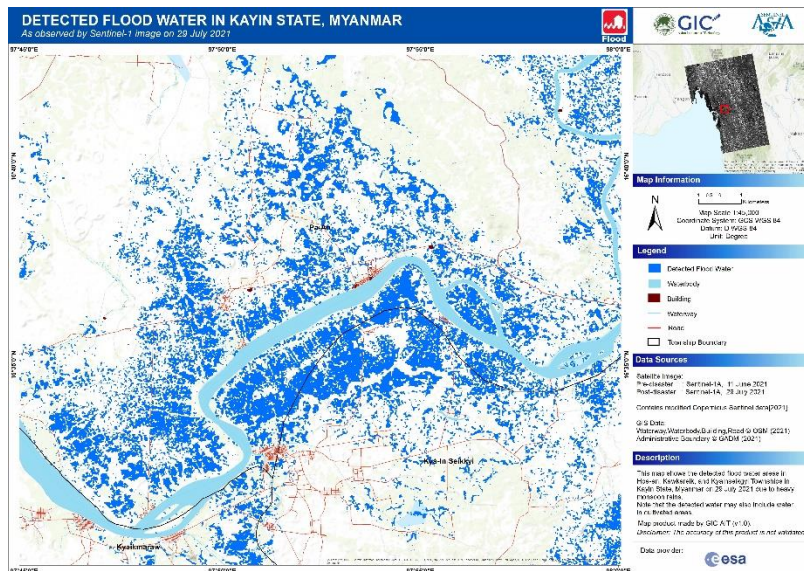
<https://sentinel-asia.org/EO/2021/article20210727MM.html>



Satellite image (Resourcesat-2) provided by ISRO



Satellite image (ALOS-2) provided by JAXA



Value Added Product by AIT

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2. [News] Emergency Observation of Disasters

(1) Flood and Landslide in Turkey (GLIDE Number: FL-2021-000113-TUR)

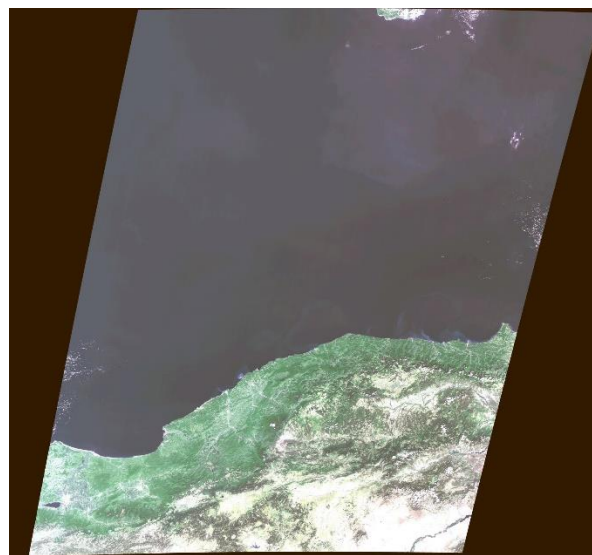
Floods and landslides occurred in Turkey on 11 August. According to FloodList, severe floods and landslides had caused major damages in several provinces of Turkey's Black Sea Region after heavy rain on 10 August 2021. Six people had died and one person had gone missing.

(<https://floodlist.com/asia/turkey-black-sea-floods-update-august-2021>)

The Disaster & Emergency Management Presidency of Turkey (AFAD) made an EOR to Sentinel Asia on 13 August. Among DPNs, GISTDA, ISRO, JAXA and NARL provided their data. Information on the latest responses by Sentinel Asia is available from the following link: <https://sentinel-asia.org/EO/2021/article20210811TR.html>



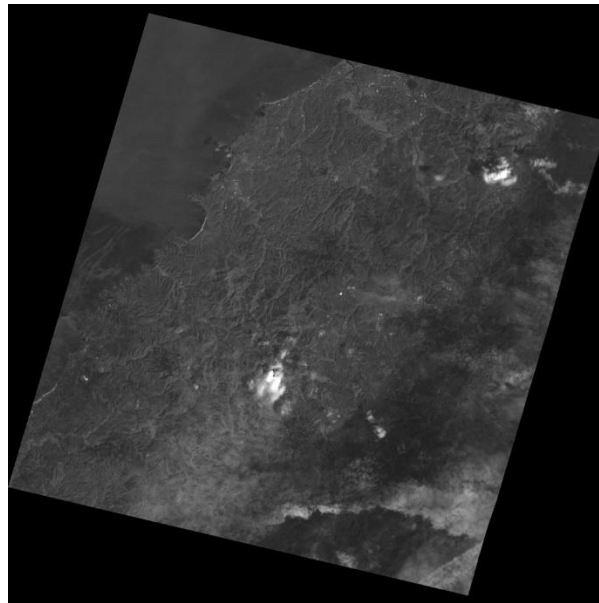
Satellite image (THEOS1) provided by GISTDA



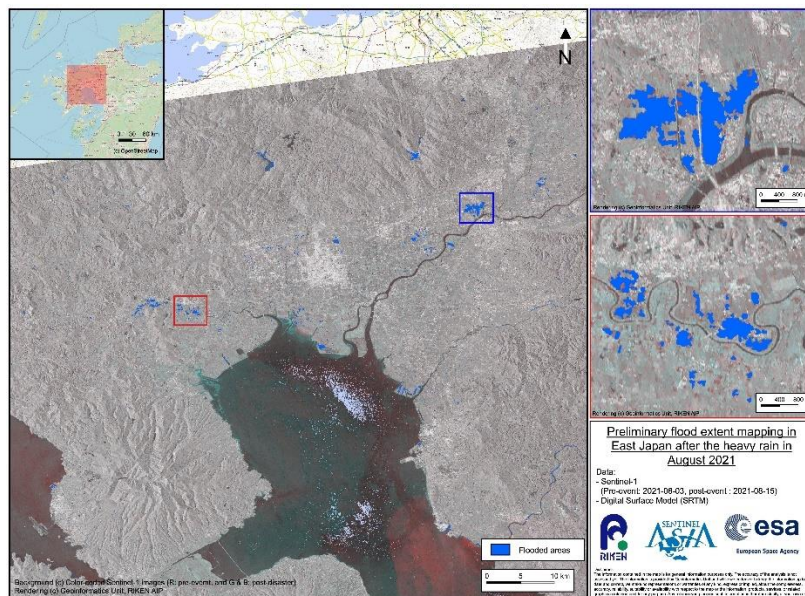
Satellite image (Resourcesat-2) provided by ISRO

provided their VAPs. Information on the latest responses by Sentinel Asia is available from the following link:

<https://sentinel-asia.org/EO/2021/article20210814JP.html>



Satellite image (THEOS1) provided by GISTDA



Value Added Product by RIKEN

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3. [Event] Report on the Sentinel Asia Training Programme on “Space Technology for Drought Risk Management” (**article contribution from ISRO and IWMI*)

On 19 and 20 July, the webinar on “Space Technology for Drought Risk Management” was held. The webinar was co-organized by the Indian Space Research Organisation (ISRO) and the International Water Management Institute (IWMI) and was facilitated by the Sentinel Asia secretariat as part of Sentinel Asia’s Capacity Building Programme. ISRO and IWMI jointly contributed the following report:

Background

Sentinel Asia is an international cooperation initiative established by the Asia-Pacific Regional Space Agency Forum (APRSAF), to demonstrate the potential value and impact of using Earth observation technologies, combined with near-real-time information dissemination methods and Web-GIS mapping tools for disaster management support in the Asia-Pacific region. The Sentinel Asia community has long recognized the need for capacity-building towards strengthening its activities. In order to address this need, at the Joint Project Team Meeting in Bangkok in 2019, a specific Training Workshop was organized for the first time in which member organizations trained together by sharing their respective expertise and knowledge. In the Training Workshop, ISRO and IWMI conducted training programmes on “topological and hydrological modelling”, and “emergency response mapping using multisource satellite data,” respectively. Following the Training Workshop in 2019, the ISRO and IWMI jointly proposed to expand its achievements, by volunteering themselves to provide capacity-building workshops for the benefit of the Sentinel Asia community. To begin with, the following capacity building programmes were proposed:

1. Space Technology for Drought Risk Management by the National Remote Sensing Centre / Indian Space Research Organization (NRSC/ISRO), India, in association with the International Water Management Institute (IWMI) on 19-20 July, 2021
2. Spatial Flood Early Warning by the NRSC/ISRO in October 2021
3. Emergency Response Mapping and Crisis Management by the IWMI in association with the Asian Disaster Reduction Center (ADRC), NRSC/ISRO in December 2021

These training programmes will be coordinated by the Sentinel Asia Secretariat. The first training programme on Space Technology for Drought Risk Management has been jointly organised by NRSC/ISRO and IWMI. About 60 participants from 11 Sentinel Asia countries / regions, ISRO and IWMI have already participated in the programme.

Drought Risk Management

Drought is a serious hydro-meteorological disaster limiting agricultural production worldwide. Drought management is closely linked to sustainable agriculture and food security. Challenges in drought management are ever increasing because drought is the manifestation of complex interactions between weather, soils, crops and human actions. Data centric technologies like satellite remote sensing, GPS, field instrumentation and mobile phones coupled with new techniques of data analysis are providing new data, information and knowledge for achieving an efficient and effective drought

management. Reliable drought indices available from satellite observations such as the Normalized Different Vegetation Index (NDVI), Land Surface Water Index (LSWI), Shortwave Angle Slope Index (SASI) and radar backscatters, as well as biophysical products like land surface temperature, soil moisture and rainfall remote sensing technology, are playing a key role in drought detection, monitoring and impact assessments. Satellite based resource maps and high-resolution satellite images are useful for developing, implementing and performing impact assessment of long-term drought management measures. Abundantly available satellite data, an increasing network of weather observatories, mobile-based fast and efficient field data collection systems, easily accessible and advanced techniques of data analysis etc., signify that there is huge scope for establishing decision support systems for drought management. Such systems would further strengthen agro-advisories, crop risk management, disaster relief, crop insurance and drought prevention strategies, among others.

Scope of the training programme

The objective of the programme was to brief the participants from Sentinel Asia members on the potential and current status of utilisation of EO technology for operational drought monitoring, in-season drought management, drought impacts assessments and long-term drought management. Advances in drought assessment with new datasets and emerging technologies also form part of this programme.

The programme consisted of expert presentations and an interactive session to make the message to be conveyed more impactful. Scope for enhancing technology utilisation, need for customisation of products and services, research gaps, as well as data and information sharing opportunities were planned and documented for future courses of action towards establishing a regional cooperation mechanism for drought risk management.

Proceedings of the 2-day training programme (19-20 July 2021)

This webinar brought together around 50 experts and practitioners from the Sentinel Asia community. The inaugural session of the training programme included the inaugural address by Dr. V. V. Rao, Deputy Director, Remote Sensing Applications, NRSC and brief remarks by (a) Dr. Shantanu Bhatwadekar, Director, Earth observation applications & Disaster management support Programme Office (EDPO), ISRO Hq. (b) Dr. Raj Kumar, Director, NRSC (ISRO) (c) Dr. Rachael McDonnell, Deputy Director General, IWMI, Sri Lanka and Mr. Takanori Miyoshi (Sentinel Asia Secretariat). This kind of capacity-building event in which Sentinel Asia members help each other build their capacities by making use of their respective experiences and expertise, was first organized by Asian Disaster Preparedness Center (ADPC) and Japan Aerospace Exploration Agency (JAXA) as part of the Joint Project Team Meeting (JPTM) in Bangkok in 2019, and this time, the ISRO and IWMI jointly took the lead to expand it further for the benefit of Sentinel Asia members. The Sentinel Asia community will continue to support and foster capacity-building among its members through mutual cooperation. Since drought is a large hydro-meteorological disaster causing huge economic losses with cascading effects, the need for using science-based evidence solutions for drought management has been well recognised. Therefore, the current training programme was quite relevant to deepen the participant's understanding of the nature of drought and the scope for new technologies to minimise losses from such disaster. All the speakers in the inaugural session pointed out the need for organising drought monitoring and management related capacity building programmes more frequently for the benefit of Sentinel Asia member countries.

Technical Session – 1 had four presentations. It started with a brief presentation on “Understanding drought disaster and its management” by the NRSC, which set the platform for rest of the

presentations. Drought is not an event like floods/cyclones. It is a complex phenomenon interlinked with meteorological, hydrological and agricultural variables. Therefore, drought monitoring and management are multidisciplinary in nature involving many institutions.

The second presentation in this session was on drought monitoring indicators. It covered extensively all the meteorological, hydrological and agricultural indicators. Satellite based indicators of precipitation, soil moisture and crop conditions were emphasised. This was followed by a demonstration on crop condition assessment using optical, thermal and microwave datasets.

The third presentation in this session was on drought monitoring practices in India with recent examples. It covered the genesis, evolution and the current status of the satellite-based drought monitoring project, namely, the “National Agricultural Drought Assessment and Monitoring System” conceptualised and started in 1989. Satellite-based drought monitoring has become one of the most successful remote sensing applications in India. The discussion then centred on the Manual for Drought Management of 2016, which is being followed in India for objective drought assessment, and highlighting the adoption of an integrated approach with multiple drought indicators. It also covered recent examples on utilisation of SAR data for drought detection, contingency crop planning developed by some states and agriculture monitoring systems being developed. Effective drought monitoring systems of some of the states were mentioned to draw the attention of the participants to the best practices on remote sensing technology utilisation for drought management.

With reliable NDVI, LSWI, IDSI, SASI and radar backscatter indices available in moderate spatial and temporal resolutions and with geospatial products on soil moisture and rainfall, geospatial technology has contributed new information and knowledge for improving drought-related assessment, emergency declarations and management in the country.

The fourth presentation in this session was on the South Asia Drought Monitoring System developed by the IWMI which is now under implementation. It covered various datasets and clues for drought assessment, decision support system, customised products, dissemination of information etc., under this project. It was also mentioned that the information on drought generated in this project was being effectively used for taking drought management actions in Afghanistan.

The second day of the webinar included Technical Session-2 and the wrap-up. In this session, there were three presentations. The first presentation was on the agro-advisory system of the Indian Meteorological Department to support farmers. It covered various information products on current and forecast weather parameters and utilisation of these data collection equipment for developing farmer advisories, and presented the institutional structure for developing and expanding them. Effective utilisation of digital technologies in terms of web tools, web portals, mobile apps, etc., for dissemination and end-use of advisories was highlighted. Feedback collection from farmers and the economic benefits as a result of the advisories were also part of the presentation, and finally, the scope for strengthening the advisories system was highlighted.

The second presentation in this session was on space technology supporting long-term drought management. Concepts for long-term drought management, hazards, vulnerabilities and risks were discussed, followed by a demonstration on using time series data on weather, satellite indicators and bio-physical parameters for drought vulnerability mapping. It was also explained to the participants that satellite-based maps of resources and high-resolution satellite images were being used to develop, implement and perform impact assessment of long-term drought management measures in India, by showing them the use of satellite and mobile technologies for monitoring and evaluating long-term drought management interventions. Smart phone-based monitoring of crop level assets has become a successful technology application in India. Overall, these crop protection mechanisms have been strengthened to become effective tools for drought risk mitigation.

The third presentation in this session was on the drought management efforts by the IWMI. Collaborative efforts between the IWMI and the private sector to develop comprehensive solutions for drought risk management and the impact of such efforts were presented, highlighting the need to develop new tools and information products, establish multi-institutional collaboration, and the role of private sector in these efforts, etc.

The brief session on interactive presentations, consisted of two presentations by participants from India and Taiwan. The first was a presentation by the Mahalanobis National Crop Forecasting Centre (MNCFC) of the Ministry of Agriculture and Farmers Welfare, Government of India, which covered the current drought monitoring system in the country using various indicators and the increasing role of space technology for drought assessment.

The second was a presentation by the National Space Organization (NSPO) of National Applied Research Laboratories (NARL) of Taiwan, which showcased the repository of satellite data being used for disaster management. Analysis ready data products are made available to the stakeholders in the form of Open Data Cubes, in public domain.

Some of the participants interacted with the experts on specific aspects of drought occurrence in their regions and the scope for developing customised information products.

Concluding remarks

The Sentinel Asia Secretariat extended his gratitude to the ISRO and IWMI for organizing this webinar, by reiterating the significance of capacity-building activities and recalling the previous achievements at the Training Workshop, which was part of the JPTM, jointly organized by ADPC and JAXA. Moreover, Mr. Miyoshi expressed his wishes for the expansion of these efforts for the benefit of the Sentinel Asia community.

The ISRO and IWMI indicated that with several open-access satellite data, an increasing network of weather observatories, mobile-based fast and efficient field data collection systems, as well as easily accessible and advanced technologies such as cloud platforms, it is now possible to develop robust drought monitoring and management systems that allow taking timely action to reduce drought risks.

It was also concluded that the regional cooperation mechanism among the Sentinel Asia member countries needed to be further strengthened in order to share the drought-related analysis ready data, as well as the knowledge and expertise for enhancing drought management capabilities.

DROUGHT WEBINAR SERIES

ASIA PACIFIC REGIONAL WEBINAR

SPACE TECHNOLOGY FOR DROUGHT RISK MANAGEMENT

LIVE WEBINAR

Jointly organized by National Remote Sensing Centre (NRSC), Indian Space Research Organization (ISRO), International Water Management Institute (IWMI) and Sentinel Asia 19 – 20 July 2021.

Drought is a serious hydro-meteorological disaster limiting agricultural production and impacting food security all over the world. Drought management is closely linked to sustainable agriculture and food security. Challenges in drought management are ever increasing because drought is the manifestation of complex interactions between weather, soil, crop and human actions. Data centric technologies like satellite remote sensing, GPS, field instrumentation and mobile coupled with new techniques of data analysis provide innovative knowledge products and information for achieving efficient and effective drought management.

Remote Sensing technology plays a vital role in drought detection, monitoring and impact assessments. With the availability of proven drought indices – NDVI, LSWI, SASI and RADAR backscatter derived information on soil moisture and rainfall available from multiple satellite systems in moderate spatial and temporal resolutions for real-time drought monitoring and early warning for timely action. Satellite based resources maps and high resolution satellite images are useful for development, implementation and impact assessment of long term drought management measures. Abundantly available satellite data, increasing network of weather observatories, mobile based fast and efficient field data collection systems, easily accessible advanced techniques of data analysis etc. signify huge scope for establishing digital agricultural ecosystem for drought management. Such a system would further strengthen agro-advisories, crop risk management, disaster relief, crop insurance and drought proofing strategies etc.

The 2-day training programme will focus on the overview of the role of Earth Observation technologies in Drought Risk Management. The objective of the programme is to appraise the participants from Sentinel Asia about the potential and current status of utilisation of EO technology for operational drought monitoring, in-season drought management, drought impacts assessments and long term drought management. Advances in drought assessment with new datasets and emerging techniques will also be covered.

The programme consists of Expert presentations, interactive sessions and panel discussion to make it more impactful. Scope for enhancing technology utilisation, need for customisation and tailor-made products and services, research gaps and data & information sharing opportunities will be identified and documented for future course of action towards establishing a regional cooperation mechanism for drought risk management.

Schedule

Day-1 (19 July, 2021; 10:00 hours to 14:00 hours)		
Inaugural Session		
Welcome by Dr. V V Rao, Deputy Director RSA	NRSC	3 minutes
Introduction by participants		10 minutes
Remarks by Shantanu Bhatawdekar, Director, EDPO	ISRO	5 minutes
Remarks by Dr. Rachael McDonnell, DDC, IWMI	IWMI	5 minutes
Remarks by Sentinel Asia Representative and about the course	TBD	5 minutes
Remarks by Dr. Raj Kumar, Director, NRSC	NRSC/ISRO	5 minutes
Vote of thanks by Dr. K H V Durga Rao	NRSC	2 minutes
Tea Break		10 minutes
Technical Session - 1		
Understanding drought and its management by Dr. Abhishek Chakraborty	NRSC	30 minutes
Drought monitoring indicators by Dr. C S Murthy	NRSC	55 minutes
Drought monitoring practices in India – recent examples by Dr. C S Murthy	NRSC	55 minutes
Drought monitoring system in South Asia by Sri. Giriraj Amamath	IWMI	55 minutes
Day-2 (20 July 2021; 10:00 hours to 14:00 hours)		
Technical Session - 2		
Recap of Day-1 by Dr. C S Murthy	NRSC	5 minutes
Agro-advisories system in India supporting farmers by Dr. K K Singh	IMD	55 minutes
Tea Break		10 minutes
Drought management platforms developed by Sri. Giriraj Amamath	IWMI	55 minutes
Space Technology support to long term drought management	NRSC	55 minutes
Country Profile and Existing Drought Mechanism		
Brief presentations by participants		30 minutes
(3 presentations of 10 min. duration each)	TBD	
Open Discussion and way forward	NRSC/IWMI	30 minutes
Vote of Thanks by Dr. C S Murthy		

Schedule of the Capacity Building Programme

