

Regional Workshop On

Enhancing Preparedness for Climate Related Disasters Using Space-Based Technologies

Webinar Report

Organized on: 17th February 2021

Jointly By



SAARC Disaster Management Centre (IU)

Gandhinagar, Gujarat, India

&



UNITED NATIONS
Office for Outer Space Affairs



International Water
Management Institute

UN-SPIDER, IWMI and CSSTEAP

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Program Note

Enhancing Preparedness for Climate Related Disasters Using Space-Based Technologies

Introduction

SDMC (IU) and the United Nations Office for Outer Space Affairs (UNOOSA), through the UN-SPIDER, organised two programmes in 2018 and 2019 for the countries in South Asia. These programmes focussed on the using space-based information for monitoring of Sendai framework and it also explored specific topics such as multi-hazard disaster risk assessment. The programme has been successful in keeping regional level engagement with disaster management community and technical organisations that are provider of space-based information in the SAARC region. These programmes are supported by two important partners: International Water Management Institute (IWMI) and Centre for Space Science and Technology Education for Asia and the Pacific (CSSTEAP). Considering the success of earlier conducted programs, it is planned to maintain continuity during COVID-19 pandemic situation, through virtual mode.

About the proposed Webinar (Training and Simulation exercises)

The workshop is aimed at supporting efforts of the countries in the region to make effective utilization of space-based information for providing early warning and risk information, which also contributes to achieve targets of the Sendai Framework. This joint effort should allow the participants to identify risk areas, access flood and cyclone related early warning information, prepare for the use of emergency response mechanisms like International Charter Space and Major Disasters and Sentinel Asia and prepare the products needed for decision making. These will be tangible outcome of the workshops. The workshop will also allow the participants to share their experiences.

Participants

The webinar engaged senior officers from National Disaster Management Authorities, senior officers dealing with DRM at various levels, agencies dealing with application of Remote Sensing & Geospatial technologies from SAARC Member States.

Organizers

- SAARC Disaster Management Centre (IU); and
- United Nations Office for Outer Space Affairs (UNOOSA), through its United Nations Platform for Space based Information for Disaster Management and Emergency Response (UN-SPIDER)
- International Water Management Institute (IWMI), Sri Lanka and
- Centre for Space Science and Technology Education for Asia and the Pacific (UN affiliated), India

Agenda

| S.No. | Technical Sessions | Time | Resource Person |
|-------|---|--|--|
| 1. | Inauguration of the Webinar | 13:30 - 14: 00 | SDMC (IU) |
| | <ul style="list-style-type: none"> - Welcome & Introduction of the Speakers - Opening remarks | <i>05 min</i> <i>02 min</i> <i>03 min</i> <i>03 min</i> | Director, SDMC (IU) Dr. Shirish Ravan – Head, UNDRR Dr. Mark Smith - Director Gen., IWMI Dr. Prakash Chauhan – Director, CSSTEAP |
| | Introductory Remarks by Member States | <i>16 min (2 min each + 4 min moderation)</i> | Representatives from all the SAARC Member States <u>Afghanistan</u> : Md. Omar Mohammadi, DIR, SMDM <u>Bangladesh</u> : Mr. Sanjay Ku. Bhowmik, Joint Secy. MoEFCC <u>Bhutan</u> : Mr. Tayba Buddha Tamang, Chief, NCHM <u>India</u> : Dr. Manoj Rajan, Commissioner, KSDMA <u>Maldives</u> : Ms. Mariyam Shizna, Prog. Coord., NDMA <u>Nepal</u> : Mr. Janakraj Dahal, Joint Secy., MHA <u>Pakistan</u> : Mr. Idrees Mahsud, Member, NDMA <u>Sri Lanka</u> : Maj. Gen. Sudantha Ranasinghe, DMC |
| 2. | Understanding meteorological information for early warning | 14:00 – 14:45 <i>(15 min each)</i> | Dr. R. Jenamani, Scientist – IMD, India |
| | Discussion | <i>15 min</i> | Moderator- Dr. Prakash Chauhan, CSSTEAP |

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| 3. | Earth Observation for Risk Analysis and scenario building <ol style="list-style-type: none"> Puzzle Presentation Online browsing of various knowledge products for natural hazards & disaster (NOAA GFS, Himawari, GloFAS, Earth Engine, NASA Worldview, Bhuvan or NDEM, Disaster charter) | 14:45 – 15:30 | Presenter & Moderator- Dr. Giriraj Amarnath, IWMI |
| 4. | Earth Observation for Emergency Response and scenario building <ol style="list-style-type: none"> Listing space-based/geospatial information mapping flood risk zones, monitoring flood situations and providing early warning <i>(Participants to put their answers in the chat box)</i> Use Case: Recent floods in Uttarakhand, India - experience of using Earth Observation. | 15:30 – 16:00 | Moderator- Mr. C.M. Bhatt & Dr. Shirish Ravan (CSSTEAP) |
| 5. | Experience Sharing by SAARC Member States | 16:00 – 16:45 (5 min each) | Representatives from all the SAARC Member States <u>Afghanistan</u> : Mr. Abdul Baset Rahmani, Sr. Advisor, SMDM <u>Bangladesh</u> : Md. Mahmud Hossain, Dy. Dir., Dept. of Env. <u>Bhutan</u> : Mr. Tayba Buddha Tamang, Chief, NCHM <u>India</u> : Mr. Raja Chakraborty, Consultant, NDMA <u>Maldives</u> : - <u>Nepal</u> : Mr. Anil Pokheral, Chief Exc. Dir., NDRRMA <u>Pakistan</u> : Mr. Muhammad Farooq, Dir. (SACRED), SUPARCO |

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| | | | <u>Sri Lanka</u> : Mr. K.A.D.P.K. Kodippili, DMC Moderator - Director, SDMC (IU) |
| 6. | Wrap up | 16:45 – 17:00 | |

Regional Workshop on Enhancing Preparedness for Climate Related Disasters Using Space- Based Technologies

Introductory Session

On behalf of the SAARC Disaster Management Centre, Mr. Sumedh Patil welcomed all the participants from respective SAARC Member States for the third webinar conducted by SDMC(IU).



The keynote address was given by Mr. P.K. Taneja, Director, SDMC (IU). He welcomed and introduced all the dignitaries and resource persons.

Opening remarks were given by Dr. Shirish Ravan – Head, UNDRR; Dr. Mark Smith - Director Gen., IWMI; and Dr. Prakash Chauhan – Director, CSSTEAP.



Dr. Shirish Ravan briefed about this third program conducted in collaboration with SDMC(IU). UNSPIDER is working with several countries in the SAARC region by providing technical advisory and services to strengthen use of space based and geo-spatial information. It has facilitated the access to satellite imagery during

emergency. Sri Lanka has already been authorized to activate the international charter which they did during Cyclone Burevi and got all the satellite images. They were assisted by IWMI to monitor the impact.



Dr. Mark Smith acknowledged on behalf of IWMI. He briefly talked about the 2019 policy brief which included possible technologies for vulnerable communities in South Asia towards climate risk. He appreciated the timely step of conducting this workshop in fascinating and crucial area of science and technology.



Dr. Prakash Chauhan emphasized on the role of space technology in early warning systems, DRR, and post disaster recovery. He talked about the issue of climate change and its implications like sea level rise, extreme weather events, etc. With the use of space technology, scientists can see the big picture.

Representatives from each Member States gave introductory remarks.

Session 1: Understanding meteorological information for early warning

Dr. R. Jenamani, IMD

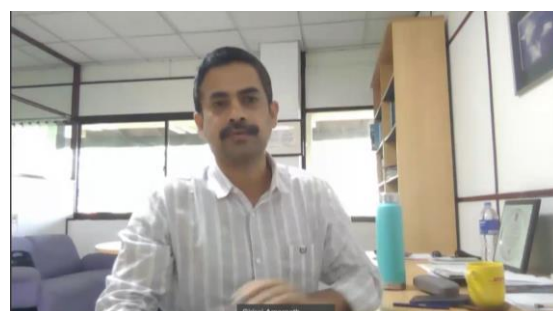


Dr. Jenamani delivered a session on Application of Space based System in Severe Weather Monitoring and Early Warning. His presentation covered the basics of Remote Sensing and its application to weather related disaster/hazard monitoring, EWS and post disaster recovery. He explained the advancement in obtaining satellite data- from 1960s when data was obtained from NOAA and now countries have their own satellites with range of receiving data in minutes.

Further he explained in detailed tracking of clouds in satellite imagery to predict the weather and watching for dust storms, smog, pollutions, forest/oil fires, volcano eruption, etc. He browsed through the RAPID application, a web-based quick visualization and analysis tool for INSAT satellite data for identification of weather events. He discussed the case of thunder-lightning event in June over Bihar and East Uttar Pradesh, States of India, that caused around 89 lives lost – analysis of satellite imagery. He further explained the examples of extreme events – heavy rainfall, tropical cyclone, dust plume, smog/pollution, their analysis and impacts.

Session 2: Earth Observation for Risk Analysis and scenario building

Dr. Giriraj Amarnath, IWMI



The session started by engaging participants in a puzzle on natural hazard terminology.



Dr. Giriraj further presented on earth observation data for risk analysis. He presented IWMI's strategy and programmes that promote resilience among farmer communities, which are largely affected by the extreme weather events happening in the region. Technologies are playing a big role and supporting governments proactively in risk management strategies. He explained the iterative approach of disaster risk continuum wherein DRM is a continuous process over time and the frameworks can't exist in different compartments of preparedness, response, recovery, etc. All the pillars should be well-connected supported by scientific

knowledge. With the help of satellite based observation, hazards can be identified, levels of exposure and vulnerability can be assessed to take timely decisions. With this sustainable climate investment can be promoted and infrastructure can be planned in better way to reduce risk in the future. He explained the application of space technology in all the four phases of DRM. He showed some examples of - Mapping water-related disaster risk, climate screening products for investing in disaster resilience, hydro-met optimization tool, use of data during cyclone Amphan – overlay of cyclone-flood hazard with covid19 cases and crops likely to be harvested, and evolution of flood risk resources and technology from paper to digital mapping. He also discussed on how next generation flood risk technologies would look like. It would be AI based prediction system. He explained in detail about the climate insurance and how it helps in enhancing resilience – Index Based Flood Insurance.

He browsed through some of the online knowledge products related to natural hazards and disaster datasets and observations like NOAA, Worldview, Global Flood Awareness System, Meteorological Satellite Centre, GEE, and Committee on Earth Observation Satellites.

Session 3: Earth Observation for Emergency Response and scenario building

Mr. C.M. Bhatt, IIRS

Mr. Bhatt explained the targets and priorities of SFDRR, Mr. Bhatt focussed on Priority 1 i.e. Understanding Disaster Risk, where space based technology has an important role to play. Post declaration of global frameworks, trends in satellite data availability from different sensors is becoming freely available to public, showing potential it has. He listed some of the recent

advancements like new geospatial policy, cloud computing, AI-ML, drones, analysis ready products, and the online resources that just require bandwidth internet to run operations.

He further presented on the case study of the recent Uttarakhand flood – Rishi Ganga Valley flash flood, Chamoli.



The cause behind the disaster was studied as an ice mask sliding causing avalanche/landslide in the rishi ganga valley and flooding the stream and river below. It damaged various hydel projects downstream and even created a lake in a tributary. The area was monitored and observed from the space data. This has been a classic example where satellite data/images have been able to give first opinion after the disaster happened. Because being a difficult terrain people were not knowing exactly where and why this happened. He showed before, during and after-event satellite images (SENTINAL, CARTOSAT, IRS) which clearly interpreted the cause of the floods. The satellite imagery of such type of events are of great help to the government to identify the area and exact damage. In this case, the satellite images were very rightfully used and was able to subside the confusion within the public.

He explained about the 'international charter' which has 61 contributing satellite, continuously providing data in different resolutions, helping to respond in a faster manner.

Session 4: Experience Sharing by Member States:

Afghanistan

The Member State representative from Office of State Minister of Disaster Management presented about the utilities and application of space based technology in Afghanistan. He briefed about the climate related hazards in the country like intensive precipitation and flash floods. The govt. of Afghanistan in collaboration with international partners has sufficiently improved the Afghanistan Natural Hazards Data Centre in terms of DRM. One of the systems established in the country is the Remote Assessment System which can be used by all stakeholders in DRM. The objective for the future is to develop for real time disaster management.

Bangladesh

The Member State representative from the Dept. of Environment gave the background of climate vulnerability of Bangladesh with the risk of sea level rise and displacement of people in coastal areas. He mentioned about the major initiatives taken by Govt. of Bangladesh in form of policy response like NDMP, Standing Orders, BCCSAP, BCCTF, NAP, etc. and actions/initiatives like institutionalization & establishment of EWS, training climate vulnerable women, cyclone & flood shelter, etc. Use of technologies to enhance preparedness – Bangladesh launched its first satellite in 2018, established Flood Forecasting & Warning Centre, Real-time Digital Weather Information through mobile app, etc.

Bhutan

The Member State representative from National Center for Hydrology and Meteorology presented on hydro-

meteorological related disasters and services in Bhutan. He gave an overview of different disaster types in Bhutan like land degradation, GLOF, flash floods, wind/thunder/hail storms, droughts, forest fire, etc. He explained the rainfall pattern raising concerns for landslides in particular months, 70% of the settlements are located along the drainage basins vulnerable to floods, various events of GLOF impact downstream, and many other significant hydro-met events. He presented the case of recent GLOF events and the rapid assessment study. Hydro-met services provided include weather services, aviation-met services, climate services historical hydrological data services, EWS, monitoring & modelling services.

India

The Member State representative from NDMA presented on experience in use of geospatial technology. NDMA has developed a GIS system which collects data from the States based on which a decision support system is being developed. He discussed about the national initiatives like India Disaster Resource Network (IDRN), GIS in DM, GIS portal of NDMA. He explained the working of IDRN which is initiated by MHA in collaboration with UNDP; BHUVAN which is single largest web GIS portal for free data and services over India; multi-layered GIS platform by NDMA & NIC; web based composite risk atlas (WEBCRA); geo-enabled messaging platform; National Database for Emergency Management (NDEM) & its use in recent Uttarakhand floods; and integrated analytical tools.

Maldives

The Member State representative couldn't present due to technical issue.

Nepal

The Member State representative from NDRRMA shared the experience of Nepal on the subject. The National Disaster Risk Reduction and Management Authority (NDRRMA) is relatively newer agency mapped within MHA. It is currently working on the five priorities; first one being risk assessment and setting up of a national disaster risk assessment portal. The agency is also working on hazard assessment with other departments that can convert the assessments into risk information that's accessible down to municipal level. The risk information helps build capacity of the local government and make informed decisions. COVID portal has been developed wherein near real time data is reported. The second priority is on early warning system – impact based early warning system that includes not only communication but also capacity building, landslide ews. The third area is reconstruction and the recovery works. Fourth area is effectiveness in the response system, support has been received by UNSPIDER in terms of training users on using satellite-based system. The last area is disaster risk financing. He highlighted the need for similar capacity building programs and exchange of knowledge within the region.

Pakistan

The Member State representative from SUPARCO briefed that SUPARCO is the key partner of the NDMA and provide space based support during the natural hazards particularly flood, earthquake, drought and landslide, and also increasing GLOF phenomenon. The SUPARCO was established as a dedicated centre post experience of two major events of 2005 earthquake and 2010 floods. It utilizes the country's own satellites and partner satellites for response during such events. NDMA is currently undertaking the multi hazard, vulnerability and risk

assessment studies and primarily for climate induced disasters. He presented a platform called Disaster Watch with various map layers for different types of events. SUPARCO has also developed recommended practices, for the UNSPIDER program, on flood hazard assessment, flood mapping and damage assessment using SENTINAL 2 optical data, and the third one is in the pipeline on drought monitoring.

Sri Lanka

The Member State representative from DMC couldn't present due to technical issue.




























Concluding Remarks




















Concluding remarks were given by Mr. Sumedh Patil and program ended with a vote of thanks.


















Webinar on Enhancing Preparedness for Climate Related Disasters Using Space-Based Technologies

17th February, 2021

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