JANUARY 2021

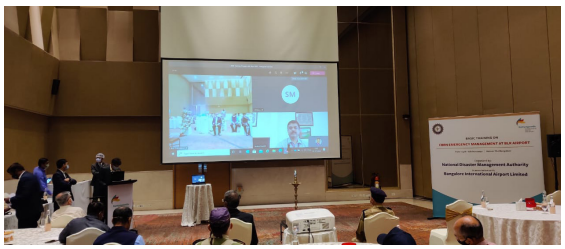
AAPDA SAMVAAD

REDUCING THE RISK OF LAKE OUTBURST FLOODS

Joint Monitoring Committee on School Safety Policy

On 3 November, the Joint Monitoring Committee for monitoring the implementation of the 'National Disaster Management Guidelines on School Safety Policy - 2016' chaired by Shri Ramesh Kumar G., Joint Secretary, NDMA reviewed the implementation of the Guidelines by States and stakeholders.

CBRN Training



On 4 November, NDMA conducted a basic training in Chemical Biological Radiological and Nuclear (CBRN) emergency management at Bengaluru through video conference for the staff of Kempegowda International Airport, Bengaluru. Thirty-six participants from various agencies responsible for the operation of the airport were trained in handling CBRN emergencies. Airport Emergency Handlers also underwent mock exercises on CBRN emergencies. The training programme was inaugurated by Shri Sandeep Poundrik, Additional Secretary, NDMA.

Review Meeting with Cold Wave Affected States

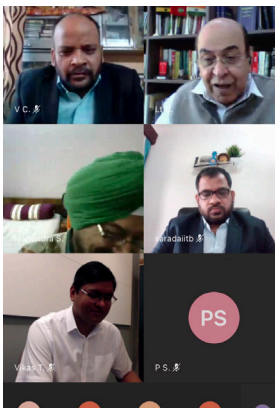
On 11 November, NDMA along with the Ministry of Health and Family Welfare, Department of Animal Husbandry and

Dairying, Department of Agriculture, Cooperation & Farmers Welfare and India Meteorological Department conducted a review meeting with cold wave affected States. Discussion included seasonal outlook, cold wave action plan, alerts, warning, health measures, animal care and agriculture.

Review Meeting on COVID-19

On 17 November, NDMA conducted a review meeting on the management of COVID-19 with Meghalaya, Sikkim, Manipur, Tripura, Nagaland, Arunachal Pradesh, Himachal Pradesh and Goa. The agenda focused on the role of SDMAs and DDMAs in managing COVID-19 with IEC campaigns and psychosocial care.

Training Program on Landslide Mitigation



On 23 November, a five-day (23 - 27 November) online training program on 'Landslide Mitigation & Detailed Project Report (DPR) Preparation' organised by NDMA in collaboration with IIT Roorkee was launched. Lt Gen Syed Ata Hasnain (Retd), Member, NDMA inaugurated the training session.

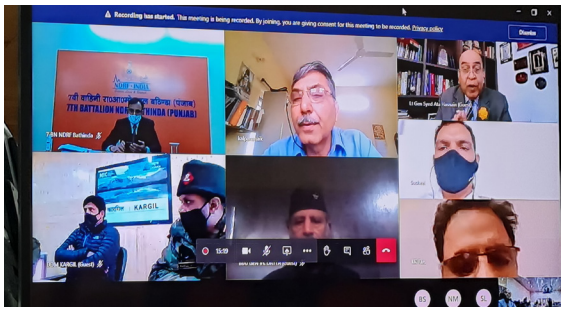
Webinar on Challenges of Disaster Management

On 1 December, Lt Gen Syed Ata Hasnain (Retd), Member, NDMA, addressed the student officers of Higher Command Wing, Army War College, Mhow, on 'Challenges of Disaster Management and Disaster Risk Reduction in India'.

International Mountain Day

On 11 December, celebrated as International Mountain Day, NDMA organised an international webinar on 'New Strategies to Mitigate the Risk of Glacial Lake Outburst Floods (GLOFs) Related Disasters in Indian Himalayan Region'. Lt Gen Syed Ata Hasnain (Retd), Member, NDMA gave the inaugural address.

IRS & Table Top Exercise



On 12 December, NDMA in collaboration with Disaster Management Department of Ladakh held an online Incident Response System workshop & Table Top exercise. Lt Gen Syed Ata Hasnain (Retd), Member, NDMA, presided over the workshop.

CBRN Training

On 15 December, a three-day (15 - 17 December) basic training in Chemical,

Biological, Radiological and Nuclear (CBRN) emergency management was conducted by NDMA at Netaji Subhash Chandra Bose International Airport, Kolkata. The training consisted of lectures as well as field training, live demonstrations of detection & decontamination and use of personal protective equipment. The training programme was inaugurated by Shri G.V.V. Sarma, Member Secretary, NDMA.

Review Meeting on Mitigation of Locusts

On 15 December, NDMA conducted a meeting with Punjab, Haryana, Rajasthan, Gujarat, Madhya Pradesh, Uttar Pradesh and the Department of Agriculture,Cooperation & Farmers Welfare, Ministry of Agriculture & Farmers Welfare, Government of India to review the preparation and mitigation measures to deal with locust attack. Shri Krishna S. Vatsa, Member, NDMA chaired the meeting.

Review of Action Taken on NDMP

On 16 December, NDMA took review of State Governments on actions taken on National Guidelines, National Disaster Management Plan 2019, and other related issues.

REDUCING THE RISK OF LAKE OUTBURST FLOODS

Glacial retreat due to global warming occurring in most parts of the Hindu Kush Himalaya, has given rise to the formation of numerous new glacial / landslide lakes which bear the potential for disastrous Glacial Lake Outburst Floods (GLOFs) or Landslide Lake Outburst Floods (LLOFs). A Glacial Lake Outburst Flood (GLOF) is a type of flood occurring when water dammed by a glacier or a moraine is released. When glaciers melt, the water in these glacial lakes accumulate behind loose, naturally formed 'glacial/moraine dams' made of ice, sand, pebbles and ice residue. A catastrophic failure of the dam can release the water over periods of minutes to days causing extreme downstream flooding. Peak flows as high as 15,000 cubic meters per second have been recorded in such events.

GLOF / LLOF events have killed thousands in many parts of the world and some of the largest events have occurred in the Himalayas, such as, the 2013 Chorabari lake outburst known as Kedarnath disaster in Uttarakhand, swelling of Jhelum river and Kashmir floods in 2014, Parechu river flash floods in Himachal Pradesh in 2005.

Due to a multi-day cloudburst, the Kedarnath disaster between 16 - 17 June 2013 became the country's worst natural disaster since the 2004 Indian Ocean Tsunami. The twin combination of melting of the Chorabari glacier and the eruption of the Mandakini river, caused the debris to block up the rivers, causing major overflow. Over 89% of the casualties occurred in Uttarakhand at that time and more than 5,700 people were 'presumed dead', this total included 934 local residents. Destruction of bridges and roads left about 3,00,000 pilgrims and tourists trapped in the valleys leading to three of the four Hindu Chota Char Dham pilgrimage sites. The Indian Air Force, the Indian Army, and paramilitary troops evacuated more than 1,10,000 people from the flood-ravaged area.

Almost within a year of the Kedarnath disaster, the northernmost region of India, Kashmir, faced another massive flood disaster in the year 2014. Continuous heavy rainfall resulting in swelling of Jhelum river, had caused a huge loss to the Rajouri, Srinagar and Bandipur regions, among many others in that region. More than 500 people died in that event and damage of properties was estimated between Rs. 5000 cr. to 6000 cr.

Other than such major disasters, there are a number of glacial lakes and landslide lakes in all the three major river basins, namely, the Ganges, the Brahmaputra and the Indus, which are very vulnerable to glacial / landslide lake outburst. Flooding of these lakes will be devastating for the surrounding areas.

In an incident of a landslide near the Phuktal river probably on 31 December 2014 about 90 km from Padum in Kargil district of Jammu & Kashmir, it blocked the course of river Phuktal, built a massive landslide dam lake along the river's length approximately 15 km long stretch, submerging nearly 270 hectares of land. In case of a sudden breach of that dam (which is known as Landslide Lake Outburst Floods (LLOF)), the result would have been devastating for the downstream areas including property and infrastructure, especially to the Nimmo Bazgo dam.

Noticing a sudden decrease in the flow of water, the district administration conducted an aerial survey on 18 January 2015 and confirmed a blockage across Phutkal river. A technical committee was formed to study the blockage and the situation was reported to the National Disaster Management Authority for further action.

Meanwhile, the district administration prepared a list of all hamlets, families, infrastructure and alternative rehabilitation sites in case the natural dam breaks and evacuated the vulnerable settlements during control blasting at blockage sites. Control rooms were established in Kargil, Leh, Padum, Phuktal, Alchi and Chilling by the first week of February 2015.

The NDMA constituted a multi-disciplinary expert team with members drawn from various concerned stakeholder organisations, namely, Central Water Commission (CWC), Geological Survey of India (GSI), National Hydro Power Corporation (NHPC), Survey of India (SoI), Snow Avalanches Study Establishments (SASE), Border Roads Organisation (BRO), Indian Army and State Administration, for further course of action.

On the basis of the observations made by the experts, an action plan was presented before the National Crisis Management Committee (NCMC). It aimed to create a trench either manually and/or by using low power explosives so that the current yield as well as stored water behind the blockage is cleared. To aid the process, CWC provided information on approximate volume of impounded water, likely additional rise in river water at various locations and corresponding travel time in case of sudden breach of the landslide dam. The team also installed an Automatic Water Level Recorder (AWLR) at a school near Phuktal Gompa to monitor the river water level on a regular basis.

An expert team of NDMA reached Leh on 23 February 2015 to oversee the entire operation. However, due to unfavourable weather conditions created by Western Disturbance (WD) at that time, the team could only reach the landslide dam location by 10 March 2015 after several unsuccessful attempts.

The team proposed a revised action plan on the next day for controlled breaching with adequate safeguards. Soldiers of Ladakh Scouts under the supervision of officers of 70 Engineers constructed a 1.2 km long footpath and installed a safety rope from the camp base to the landslide location.

On 12 March 2015, the team inspected the landslide dam and identified the least resistant path for water flow using controlled blasting and excavation process. After continuous attempts using a variety of tools and techniques, the proposed trench was finally created on 16 March, 2015. The blasted boulders were removed manually. Approximately, 2m x 1.5m and 100m long trench was completed for controlled release of impounded water. Small humps, which were impeding the water flow, were removed using crowbars. The finer particles of debris in the channel were gradually washed out and the size of the channel increased resulting in slow but sure breaching of the landslide dam.

A major disaster-in-waiting was thus averted with coordination and cooperation from all the involved agencies. Later, NDMA developed a Standard Operating Procedure (SOP) on Averting Threats Emanating from Landslide Dams on Rivers in Mountainous Regions and circulated the same to all the hill states and concerned stakeholders.

In view of the above incidents, NDMA collaborated with the Swiss Agency for Development and Cooperation (SDC), Embassy of Switzerland to India, to develop the NDMA Guidelines on the Management of Glacial Lake Outburst Floods (GLOFs) to formulate strategies for GLOF and LLOF risk management, reduction and mitigation in the country. These Guidelines are a way forward for the concerned Ministry/Department and other concerned stakeholders who will take actions for preparedness, prevention, mitigation, response to GLOFs and LLOFs, with awareness, capacity building of vulnerable areas, thus, reducing imminent danger.

This is the beginning of managing GLOF / LLOF in India. The major challenges to avert or reduce the impact of GLOF / LLOF calamities, such as the development of robust GLOF / LLOF early warning system with last mile connectivity, adoption of multi-hazard ground realities during developmental planning and implementation of projects, awareness generation of public and local communities, capacity building of line departments of affected States/UTs and other stakeholders through innovative approach, integration of space and latest science-technology inputs into identification, monitoring and mitigation of GLOF / LLOF are a few major ones on priority. Local authorities and bodies must understand their role and responsibilities in enforcement of regulations and codes in construction and flash flood management practices due to GLOF / LLOF in hilly terrain with the involvement of local communities.

The ten-point agenda on Disaster Risk Reduction (DRR) outlined during the 7th Asian Ministerial Conference in the year 2016 by the Hon'ble Prime Minister of India, reflects upon the 'opportunity to learn from a disaster'; and is one of the major learnings to look forward to with regard to GLOF / LLOF disaster events.

THINK WATER THINK LIFE

Conserving it not only means groundwater resources for our future generations but also reduced risk of flooding and better irrigation systems. Traditional rainwater harvesting techniques have been doing this for ages and there's plenty to learn from them. Here are a few:

Kuhls - Diversion channels which have carried water from glaciers to villages in the Spiti area of Himachal Pradesh for a long time. Where the terrain is muddy, these are lined with rocks to keep it from becoming clogged.

Kuis - Kachcha structures (10-12 m) dug near tanks dug near tanks to collect seepage; usually covered with planks of wood. Mouth of the pit is narrow and gets wider as it goes deeper. These can also be used to harvest rainwater in areas with meagre rainfall. Found in Bikaner and Jaisalmer, Rajasthan.

Ahar Pynes - Indigenous to south Bihar, this irrigation system leverages the natural marked slope of the terrain. It is embanked on the remaining three sides. Pynes are diversion channels made to utilise river water in agricultural fields. Starting out from the river, they run through fields to end up in an ahar.

Zabo - Literally meaning 'impounding run-off', the system is practiced in Nagaland. It consists of a protected forestland towards the top of the hill, water harvesting tanks in the middle, and cattle yards and paddy fields at the lower sides thus combining water conservation with forestry, agriculture and animal care.

Panam Keni - A native to Wayanad district of Kerala, panam kenis are special wells. Made by soaking the stems of toddy palms in water for a long time so that the core rots away until only the hard outer layer remains. These cylinders are then immersed in groundwater springs in fields and forests. A source of abundant water even in the hottest summer months.

Ramtek Model - Named after the water harvesting structures in Ramtek, Maharashtra. An intricate network of groundwater and surface water bodies, this system consists of tanks forming a chain from the foothills to the plains. Once the tanks located in the hills are filled to capacity, the water flows down to fill successive tanks, generally ending in a small waterhole which stores the residual run-off as well.

NDMA reviews Aapda Mitra scheme in Uttar Pradesh

A team headed by Shri Rajendra Singh, Member, NDMA comprising of Shri Ramesh Kumar G., Joint Secretary (NDMA), Shri Nawal Prakash, Joint Advisor (NDMA), Dr Pavan Kumar Singh, Joint Advisor (NDMA), Ms.Tanushree Verma, Sr. Consultant (CBDM) and Shri Brajesh Jaiswal, Project Associate, Aapda Mitra visited Lucknow and Gorakhpur, Uttar Pradesh from 15 - 18 October 2020, to review the schemes and programmes being implemented by National Disaster Management Authority in partnership with Uttar Pradesh and any new initiative been taken by Government of Uttar Pradesh in the field of Disaster Risk Reduction.

Day One- Lucknow (16 October 2020)

Meeting with Hon'ble Chief Minister of Uttar Pradesh

NDMA team comprising of Shri Rajendra Singh, Member, NDMA; Shri Ramesh Kumar G., Joint Secretary, NDMA; Shri Nawal Prakash, Joint Advisor, NDMA and Dr Pavan Kumar Singh, Joint Advisor, NDMA called on Shri Yogi Adityanath, Hon'ble Chief Minister of Uttar Pradesh. During the meeting Smt. Renuka Kumar, Addl. Chief Secretary, Revenue, Govt. of Uttar Pradesh, Shri Sanjay Goel, Relief Commissioner, Govt. of Uttar Pradesh were also present. While appreciating the outcome of pilot scheme of Aapda Mitra, the Hon'ble Chief Minister desired that Prayag Raj may also be included into the upscaled scheme of NDMA. He further emphasized upon the requirement of awareness generation for lightning and thunderstorm. Discussion was also held on effective response by the State government under leadership of Hon'ble Chief Minister to tackle the issues related to migrant labourers during the pandemic COVID- 19. Member, NDMA presented the Pocket Books on Do's and Don'ts, Guidelines on School Safety, Boat Safety, Disability inclusive DRR and National Disaster Management Plan to Hon'ble CM.

Visit to State Disaster Management Authority

The team visited Uttar Pradesh State Disaster Management Authority on 16 October 2020 to interact with the officials of SDMA and representatives of the line department. The meeting was chaired by Lt Gen R. P. Sahi, Vice Chairman, UPSDMA. A detailed presentation was made by Shri Sanjay Goel, Relief Commissioner, on various schemes being implemented by NDMA viz. Aapda Mitra, SRDR, implementation of school safety guidelines , AMRUT cities, strengthening of DDMAs and new initiatives taken up by UPSDMA in view of local hazards viz;

1. **Samudai Adharit Aapda Prabandhan Prashikshan Priyojna (Community based Disaster Management Training Programme)-** To generate awareness in community based voluntary engagements for all types of disaster mitigation, in a comprehensive manner. The program is aimed to train officials both at district and village levels as well as volunteers from the community.
2. **Mukhyamantri School Suraksha Karyakram (School Safety)-** The objective of this initiative is to sensitise children and the school community on disaster preparedness and to develop a safe learning environment in schools.
3. **Vjrapat Suraksha Karyakram (Lighting hazard)-** Development of Lighting Action Plan with short term, long term interventions.
4. **Online flood work plan module-** It is an unique initiative by UPSDMA for developing work plan of each district including history of flood hazard by feeding data online. A citizen dashboard has also been developed with geo-tagging of flood shelters. Similarly, an online loss analysis and relief distribution module has also been developed.

Shri Rajendra Singh, Member, NDMA appreciated the new initiatives being undertaken by UPSDMA for mitigating the impact of various hazards with effective preparedness and for developing a culture of safety. He also emphasized upon the documentation of best practices in an effective manner to be shared at larger platforms.

Day Two- Gorakhpur (17 October 2020)

On day two, the team visited Gorakhpur, one of the districts selected under the Aapda Mitra scheme. Under the scheme, 200 volunteers have been trained in disaster response especially in flood response, out of which 18 are female volunteers. To inculcate the essence of preparedness among the community and to review the response mechanism of trained Aapda Mitras, a mock exercise was organised on flood rescue on 17 October 2020 in Gorakhpur on the banks of Rapti river. Live demonstrations of life-saving equipment such as bottle life jackets, gallons and coconut life jackets, boats made from drum and bamboo, were demonstrated by Aapda Mitras. A total of 115 Aapda Mitra,

including, 20 Students from DDU Gorakhpur University, 20 NDRF personnel, 22 SDRF personnel, 30 PAC personnel and other staff members of DDMA participated in the mock drill. Other response agencies viz; police, health, animal husbandry, irrigation, municipal corporation, civil defence, food and logistics, agriculture, District Panchayati Raj, fire department, transport department also participated in the drill as 'emergency support functionaries.'

Exhibition and demonstration

An exhibition was organised by various departments consisting of a range of technical demonstrations for services and products in disaster management. Demonstration of stockpiles purchased under the Aapda Mitra scheme was also done by the District Administration.

Release of documentary film- "I am Aapda Mitra"

A documentary film, 'I AM AAPDA MITRA' was released by Shri Rajendra Singh, Member, NDMA made by DDMA-GKP, capturing various efforts taken by Aapda Mitra under the supervision of District Administration in minimising the impacts of various hazards. The documentary would be an important tool of communication and awareness generation at mass level.

In the end, while appreciating the efforts of Aapda Mitra Shri Rajendra Singh, Member, NDMA shared that volunteerism is a fundamental source of community strength and resilience that exists in all societies throughout the world and it forms an integral part of the local disaster risk management. NDMA recognizes the importance of active involvement of volunteer forces like Aapda Mitra in disaster risk reduction at local level. Shri Ramesh Kumar G., Joint Secretary, NDMA while applauding the efforts of Aapda Mitra shared that this platform has developed a sense of responsibility and self-respect among the volunteers and they are able to perform more active and constructive roles in society.

Outcome and Way forward

NDMA's team interacted with all the stakeholders including field functionaries on various issues of disaster risk reduction; they also discussed effective implementation of all the schemes/ projects of NDMA and more such visits may be organised in future to strengthen coordination mechanisms between NDMA and SDMAs.

THE FIVE FAQS - AVALANCHE

1

What is an avalanche?

An avalanche is an event that occurs when a cohesive slab of snow lying upon a weaker layer of snow fractures and slides rapidly down an inclined slope such as a mountainside.

2

Why does it occur?

An avalanche occurs when a layer of snow collapses and slides downhill. Avalanches are caused by a steep slope, snow cover, a weak layer in the snow cover and are triggered by either natural forces, such as precipitation, wind drifting snow, rapid temperature changes or human activity.

3

What are the signs of an avalanche?

Avalanches mostly occur on steep slopes - between 25 and 45 degrees, convex slopes (spoon-shaped). Loose, underlying snow is more dangerous than when compact and new snow is particularly dangerous. Rapid snow settlement is a good sign as loose, dry snow slides more easily. Low temperatures increase the duration of snow instability, while a sudden temperature increase can cause wet snow slides.

4

How to stay prepared?

Keep track of weather before heading for snow-capped mountains. Stay indoors and suspend all outdoor plans once an official warning is issued, avoid steep slopes and keep an evacuation plan ready. During a low danger avalanche warning, move on slopes carefully and mark your tracking path using a piece of cloth, stick etc.

5

If stuck, how to stay safe during an avalanche?

Try to stay on the surface or get away to the sides and hold on to something sturdy. Make breathing space by creating an air pocket using one hand and knock the surface regularly to attract rescuers.

Warming up to Cold Wave

Follow simple precautions

- Have adequate winter clothing
- Stay indoors as much as possible
- Prefer mittens over gloves; mittens provide more warmth and insulation from cold
- Listen to radio, watch TV, read newspapers for weather updates
- Drink hot drinks regularly
- Take care of elderly people and children
- Store adequate water as pipes may freeze
- Have emergency supplies ready

No Carelessness until there is a Cure

Stay Protected from Corona

Frequently wash your hands with soap

Wear your mask properly

Maintain safe distance

BE SMART BE PREPARED

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