

AUGUST 2019



AAPDA SAMVAAD

Addressing Glacial Hazards and Risks



900 evacuated from train stranded in flood

Mahalaxmi Express, which runs between Mumbai and Kolhapur in Maharashtra, was held up between Badlapur and Wangani railway station on July 27, 2019, due to waterlogging on the tracks. It had nearly 900 passengers and staff onboard.

Two teams of National Disaster Response Force (NDRF), one each from Mumbai and Pune, along with nine boats and other necessary rescue equipment and NDRF teams reached the site. Meanwhile, Navy and Air Force teams were also deployed for the rescue operation. The naval teams reached the site with specialist divers. Two Mi-17 Indian Air Force helicopters were also pressed into service. Two columns of Army along with 130 trained staff, food packages, water and rescue material were also deployed.

In spite of fully water logged roads, tough and undulating terrain, all the stranded passengers and railway staff were safely evacuated from the train.

A special train was arranged for taking the passengers up to Kolhapur.

MoUs signed for LRMS

NDMA signed MoUs with Mizoram, Nagaland, Sikkim and Uttarakhand for the implementation of Landslide Risk Mitigation Scheme (LRMS) for improving Disaster Risk Governance of State Disaster Management Authorities/ District Disaster Management Authorities.

LRMS is a pilot scheme to demonstrate benefits of landslide mitigation measures along with landslide monitoring, awareness generation, capacity building / training, HR support, skill development and review-revision of codes/standards/guidelines and



preparation of framework of new regulations. The scheme envisages financial and technical support to landslide-prone States for site-specific landslide mitigation.

Out of the total cost of Rs. 43.92 crore, Rs. 13.18 crore have been released as first instalment to the States.

MRDS training held

The National Disaster Management Authority (NDMA) has launched a pilot project to train police and National Disaster Response Force (NDRF) personnel on managing radiological emergencies at public places. The project aims to extensively train select officers who will then prepare other personnel in their respective States to handle such emergencies. Under this project, radiation instruments are being installed in the police departments of 56 select cities.

The seventh batch of 39 police personnel from seven States and four NDRF officers was trained at NDRF 8 Battallion, Ghaziabad from June 17-28, 2019 by experts from the Bhabha Atomic Research Centre (BARC).





Earthquake ME in Himachal

NDMA in collaboration with the Himachal Pradesh State Disaster Management Authority (HPSDMA) conducted a State-level Mock Exercise on earthquake preparedness on July 11, 2019. The exercise that was held simultaneously in all districts of the State aimed to enable all stakeholders in evaluating the effectiveness of their disaster response plans.

In the run-up to the exercise, a coordination conference and a table top exercise were held from the State Capital through video conferencing for working out the detailed modalities and preparations required for the mock exercise.

The exercise gathers significance as the entire State falls in the seismic zone V and IV.

The Kangra Earthquake of 1905, which killed around 20,000 people, remains the last major earthquake witnessed by the State. Since then, the risk has increased manifold given population explosion and construction activity across the State.

Flood ME in Uttar Pradesh

In its efforts towards improving flood preparedness during the monsoon season amidst rising water level



in the rivers of Uttar Pradesh, NDMA conducted the largest Mock Exercise on floods in conjunction with the Uttar Pradesh State Disaster Management Authority (UPSDMA) and the Government of Uttar Pradesh on July 18, 2019.

The exercise was simultaneously conducted in 39 flood-prone districts of the State. It aimed at improving the administration's capacity in mobilising resources and reaching out to the affected communities swiftly in case of an actual flood situation.

This exercise was preceded by an orientation-cum-coordination conference on July 10, followed by a tabletop exercise on July 17 through video conferencing with all participating districts from the State Capital. These preparatory meetings were conducted to ensure the smooth facilitation of the exercise.

Meeting to review "Aapda Mitra" scheme

NDMA conducted a meeting to review the progress in the implementation of the scheme for "Training of Community Volunteers in Disaster Response (Aapda Mitra)" on July 16, 2019. Participants shared feedback/suggestions to upscale the scheme from the current 200 districts to all the hazard-prone districts in the country. They also suggested that the scheme should be extended to disasters other than flood as well.

'Aapda Mitra' scheme aims to equip 200 community volunteers each in selected 30 most flood-prone districts in 25 States with the skills to respond to their community's immediate rescue and relief needs in flooding situations.



NOBODY LIKES IT HOT

Beating the heat with micro-innovations

- Shivani Raina, Architect, SEEDS



SEEDS volunteer at a community feedback event at Masudpur slum.

Heat wave is a period of abnormally high temperatures, more than the normal maximum temperature that occurs during the pre-monsoon summer season. The resultant atmospheric conditions adversely affect people living in regions reeling under heat wave conditions with poor slum dwellers forming one of the most vulnerable segments of the population.

When summer is at its peak, what happens to those living in informal settlements? Slums are categorised as high risk for heat waves in India due to occupation, built environment and poor health (NDMA 2017).

A first look at what makes slum houses vulnerable revealed the typical tin house for what it is—a hot metal box clad in combustible materials where temperatures could easily reach 51°C.

The story of heat wave vulnerability, however, is not about the tin house but about the people who live in them. The residents of Masudpur slum of Vasant Kunj in Delhi, for example, said that summer was the most difficult time of the year. Yet, mainstream

market options to improve thermal comfort were either too expensive or too alien to ever be adopted in settlements like this one. It needed simple do-it-yourself options.

A cursory glance at the homes in Masudpur made their innovativeness evident. They had everything from waste insulation to plants growing out of tins. Was it possible to use these strengths as the basis for effective retrofits to improve thermal comfort?

Over a few months, SEEDS helped prototype and test five retrofits, analysing their performance both in real time and through EnergyPlus simulations. Multiple community feedback events ensured they



Community resident recording real-time thermal data

were acceptable to the slum community; and a manual was published with step-by-step instructions on creating and installing them.

- Double Roof: Most of the heat gained by these tin houses comes from the roof. Inspired by the old billboard flex awnings built by the families, SEEDS proposed a double roof made from the same material that was cheap and easy to install.

- Skylight-&-Vent: No usable windows often result in slum houses becoming dark, stuffy and filled with smoke whenever the stove is used. The idea was simple: cut a hole in the roof and line it with steel wire mesh to create a skylight. A simple solar exhaust can be made using a plastic bucket and added to this skylight. The ventilation helps the house cool down and it is better lit.

- 'Drum-Wall': Families in Masudpur do not have access to piped water supply; instead tankers bring water once in ten days. As a result, the entire area is dotted with an army of water drums. Houses that piled up the drums vertically instead of horizontally, were considerably cooler. This is due to the thermal mass of the water in the drums. The retrofit came in the form of a bamboo-based stand to organise these drums, support a desert cooler and hang plant pots. Made with regular bamboo-ladders, the 'drum-wall' improves thermal and visual comfort and food safety. The drum wall also redirects and filters rainwater from the double roof for collection.

- Flexible False Ceiling: Slum households used stuffed cardboard under their ceiling to insulate it. Cardboard is inflammable and tends to rot over time.

Instead a retractable flexible ceiling made of old billboard flex and bamboo was proposed. It can be opened and closed as per the time of the day (and season) to allow the house to cool down and heat up as and when required.

- Tyre-Tube Thermal Break: Another interesting innovation was cycle tyre-tube lined doorways to prevent scrapes. The retrofit was to use the tubing to line the top of the tin walls to create a break between them and the tin roof, breaking the thermal bridge.

These five small micro-innovations could truly help beat the heat. For together, they cost just USD35 to make and could reduce internal temperature by over 10 degrees (as validated by Visvesvaraya National Institute of Technology Nagpur).

These pilots were part of a broader Disaster and Emergencies Preparedness Programme (DEPP) Innovation Lab initiative; a shift in the humanitarian sector to identifying and funding community-based solutions. This continues to remain a core focus for SEEDS. For as the lessons from the Masudpur pilot emphasise, 'by recognising what is strong in the community, restoring their faith in this strength and using it to address what is wrong, we can make what is strong, even stronger still' (Cormac Russell 2017).



Drum wall made of bamboo ladders

Addressing Glacial Hazards and Risks

Glaciers in the Indian Himalayan Region are the source of life and livelihood for millions of people who rely on rivers that originate from its peaks. The country is facing a severe water crisis, and rapid changes in the glacial and permafrost environments is worrying. Over the years, the thinning and retreating of Himalayan glaciers has resulted in the formation of new glacial lakes and enlargement of existing ones.





With shrinking glaciers, expanding glacial lakes and altered stability of surrounding moraines and ice walls, the potential threat of Glacial Lake Outburst Floods (GLOFs) is evolving over time. GLOFs refer to the sudden discharge of a water reservoir that has formed either underneath, at the side, in front, within, or on the surface of a glacier. Jammu and Kashmir, Ladakh, Himachal Pradesh, Uttarakhand, Sikkim and Arunachal Pradesh are the regions most vulnerable to glacial hazards.

A media report calls a GLOF "a ticking time bomb... capable of releasing billions of cubic metres of glacial water, stored for decades, in a few short hours or even in a matter of minutes and virtually without warning to those living downstream." This was evident during the 2013 Kedarnath disaster when the Chorabari lake collapsed at its rim with devastating impacts on communities and infrastructure, literally wiping away the entire temple town and reversing development gains.

As the Indian Himalayan Region is particularly sensitive to changes in global climate, and with residential, tourism and hydropower infrastructure expanding higher into alpine valleys, the need for the assessing and managing of glacial hazards by mainstreaming those into major policies was felt. National Disaster Management Authority constituted a Task Force of experts for preparing guidelines for the management of glacial hazards and risks, especially GLOFs.

For taking this agenda forward, the Authority in collaboration with Swiss Agency for Development and Cooperation (SDC), Embassy of Switzerland in India, organised a two-day inception-cum-brainstorming workshop on July 3-4, 2019, on the

assessment and management of glacial risks, particularly GLOFs. The outcomes and learnings from this workshop will eventually lead to the formulation of national guidelines and conceptualisation of projects for glacial risks. These guidelines will focus on robust forward-looking planning and actions to ensure climate adaptation and sustainable mountain development. While drawing on international best practices and experience, these actions will be tailored to the local context for effectively reducing risk components of hazard, exposure, and vulnerability.

- **J&K, Ladakh, Himachal, Uttarakhand, Sikkim and Arunachal most vulnerable**
- **Collaborative approach needed to adapt to Climate Change**

The technical sessions at the workshop established the context and priorities besides discussing specific case studies and experiences in managing glacial risks and hazards from Central Asia, Europe, Caucasus and Indian Himalayan States. Key messages and the way forward were also identified.

The workshop emphasised on the need for coordinated and collaborative top-down approach amongst all stakeholders besides capacity building of State administration and local communities to adapt to the changing climatic regime.

Members and senior officials of NDMA, representatives from the SDC, State Governments of Sikkim and Himachal Pradesh, Task Force experts from national as well as international academic institutions and other stakeholders participated in the workshop.

Glacial events from the past

Parechu River (2004)

In August 2004, 35 km from the Himachal Pradesh border along the Sutlej Valley, a huge artificial lake began to be formed due to landslide on river Parechu, a tributary of the river in Tibet, China. If the fast swelling lake had burst, a surge of water wall could have caused havoc. Thankfully, the lake did not burst. However, the period from August to October 2004 was the worst time for the downstream dwellers as they had to be evacuated because of the building threat.

Chorabari Lake (2013)

Extreme rainfall, cloudburst and landslide led to the outburst of the moraine-dammed Chorabari Lake lake, located at 3900 metres above the sea level. The lake fed the Mandakini river, which caused flash floods in Kedarnath and triggered numerous landslides. The incident resulted in many deaths and a huge devastation. Thousands were reported missing.

Phuktal River (2015)

In December 2014, a landslide occurred near the Phuktal river in the Zaskar region of Kargil district, then Jammu & Kashmir. The landslide, which blocked the course of river Phuktal, tributary of the river Indus, built a massive landslide dam lake of approximately 15 km along the river's length posing a great threat to life, property and infrastructure, especially the Nimmo Bazgo dam, in case of a sudden breach.

A multi-disciplinary team of experts, drawn from various stakeholder organisations, was constituted. By using controlled blasting, this team channelized the blockage and averted any disaster. due to artificial channel by the use of control blasting.

Other similar events which have been dealt by NDMA include the blockage of river Kanka, Sikkim (2016) due to a landslide where technical support was provided to the Government of Sikkim and Kalikhola landslide, Manipur (2017) where temporary blockage and development of earth cracks with land subsidence had occurred in Kalikhola village, Kangpokpi, Manipur.

Debris flow in Gaumukh Gangotri Glacier – 2017

In 2017, the formation of a temporary landslide dam lake due to the flow of debris near the snout of Gangotri glacier was noticed. This blocked the flow of river Bhagirathi for a while. There is a shift in the course of the river channel because of the accumulation of debris in the channel. The debris included vast amounts of paraglacial and alluvial sediments flow.



URBAN FLOODING

BEFORE

- Keep drains clean - Do not litter waste, plastic bags, plastic bottles in drains.
- Remain safe inside - Try to be at home if high tide and heavy rains occur simultaneously.
- Be informed/be alert - Listen to radio, watch TV or read newspapers for weather updates and flood warnings.
- Survival is key - Prepare an emergency kit with essential items for safety and survival.
- Keep your documents and valuables in water-proof bags.
- Do not venture into flood water.
- Do not spread and/ or believe in rumours.

DURING AND AFTER

- Ensure safety - Turn off power and gas connection; be alert for gas leaks.
- Respond quickly - Evacuate low lying areas and move to higher places.
- Evade illness - Drink boiled/chlorinated water.
- Watch your step - Stay away from sewerage lines, gutters, sharp objects and debris.
- Don't get electrocuted - Stay away from electric poles and fallen power lines to avoid electrocution.
- Don't walk/swim through flowing water.
- Don't drive through flooded areas.
- Don't eat food that has come into contact with flood water.
- Don't use any damaged electrical goods.
- Don't use electrical equipment while standing on wet floors, especially concrete.



Address:

NDMA Bhawan

A-1, Safdarjung Enclave, New Delhi - 110029

Telephones : +91-11-26701700

Control Room : +91-11-26701728

Helpline Number : 011-1078

Fax : +91-11-26701729