

Activity of SSDMA

Introduction

Sikkim is prone to various natural disasters due to its geographical location, including Landslides, Earthquakes, Flash floods, Lightning, Heavy rainfall/ Avalanche and GLOF. To address these challenges, the Sikkim State Disaster Management Authority (SSDMA) has taken significant steps involving all specialised State, Central and domain experts from external agencies. The initiative by the SSDMA has been aimed to suit enhance disaster preparedness and response capabilities of disaster responders across the state.

Key Actions Taken

1. Satellite Communication

SSDMA has made notable advancements in communication systems to ensure uninterrupted connectivity during disasters.

- **Deployment of Satellite Phones:**

SSDMA has deployed a total of 8 satellite phones across the state to provide reliable communication in the event of terrestrial network failures.

- Each district, has been equipped with a satellite phone.
- Additional satellite phones have been allocated to the SSDMA Headquarter and Chungthang to enhance coordination capabilities.

This step ensures that all districts maintain a communication lifeline during emergencies, facilitating the coordination of relief operations and information dissemination.

2. Common Alert Protocol (CAP) Sachet for SMS-Based Warnings

SSDMA has successfully implemented the Common Alert Protocol (CAP) Sachet, a state-wide project aimed at disseminating SMS-based alerts and warnings to the public. This system is crucial for timely and effective communication of potential disaster threats.

- **Features of CAP Sachet:**

- Automated dissemination of alerts via SMS to residents in affected areas.
- Integration with national and regional alert systems for consistent messaging.
- Real-time updates to the public about potential hazards and safety measures.

The CAP Sachet system allows residents to receive immediate warnings and instructions, reducing the risk of harm and ensuring prompt action in case of a disaster.

3. Extension of Emergency Response Support System (ERSS) 112

The ERSS, a national initiative for emergency services, has been extended to incorporate disaster management functionalities in Sikkim.

- **Implementation of ERSS 112:**

- 24/7 helpline number operational for disaster-related emergencies.
- Trained personnel to handle disaster calls and dispatch necessary resources quickly.
- Coordination with local authorities and emergency services to ensure rapid response.

By integrating ERSS 112 into disaster management, Sikkim has streamlined its emergency response mechanism, ensuring that assistance is readily available to those in need.

4. Establishment of Emergency Operational Centers

The SSDMA has prioritized the establishment of operational centers to manage disaster response activities efficiently.

- **District Emergency Operational Centers (DEOCs):**
 - Fully functional DEOCs have been set up in six districts: Gangtok, Pakyong, Mangan, Namchi, Gyalshing, and Soreng.
 - These centers are equipped with modern technology to take care disaster management activities.
- **State Emergency Operational Center (SEOC)**
 - The SEOC, located in Gangtok, operates 24/7 and serves as the central hub for disaster management in Sikkim.
 - It is equipped with state-of-the-art facilities to support communication, data analysis, and decision-making processes.
 - The establishment of these centers ensures a structured approach to disaster management, with clearly defined roles and responsibilities for coordinating disaster response efforts.

5. Installation of Automated Weather Stations for GLOF

In collaboration with the Swiss Development Cooperation (SDC) and the National Disaster Management Authority (NDMA), SSDMA has initiated the installation of Automatic Weather Stations (AWS) at two critical glacial lakes in North Sikkim. These installations are pivotal in monitoring climatic and hydrological parameters, which are essential for predicting and mitigating the risk of Glacial Lake Outburst Floods (GLOF).

- **Locations:**
 - South Lhonak Glacial Lake in North Sikkim
 - Sako chu Glacial Lake in North Sikkim
- **Functionality:**
 - Continuous monitoring of temperature, precipitation, and water levels.
 - Real-time data transmission to a central monitoring system for analysis.
 - Integration with an Early Warning System (EWS) to provide timely alerts to downstream communities, enhancing preparedness and response strategies.

These initiatives provide critical insights into the environmental dynamics surrounding glacial lakes, facilitating informed decision-making and proactive disaster management measures.

6. High-Altitude Glacial Lake Expeditions

Expeditions Conducted: 11 expeditions to high-altitude glacial lakes by SSDMA

Recent Expeditions (2024): 9th, 10th, and 11th expeditions

Significance:

- **Post-Flash Flood Impact (4th October 2023):** AWS at South Lhonak Lake was washed out due to the flash flood.

- **Expedition Goals:** Study risks of 16 vulnerable glacial lakes identified by NDMA, reinstall AWS, and install an additional pressure probe at South Lhonak Lake.
- **Collaboration:** SSDMA, SDC, NDMA, and various central and state government line departments participated in the expeditions.

7. Installation of Avalanche Monitoring Radar

Lead Agencies: DGRE under the supervision of the Indian Army and SSDMA

Location: North Sikkim (at an altitude of 15,000 feet)

Significance:

- First-of-its-kind in India, capable of detecting avalanches within three seconds of a trigger.
- All-weather monitoring: functions through snow, fog, and night conditions.
- Coverage: 2 sq/km, reducing the need for additional instruments in dangerous avalanche-prone areas.
- Linked to an alarm system for automatic control and warning measures.
- Records images and videos for expert analysis.
- Dual-use: can detect both avalanches and landslides.

8. Aapda Mitra Training Programme

Launch & Objectives:

- NDMA Notified Scheme dated 11th August 2016
- Objective: Train community volunteers in basic relief and rescue tasks during emergencies

Initial Phase:

- **Training Target:** 6,000 volunteers from 30 vulnerable districts
- **Start Year:** 2018
- **Training Institute:** Central Training Institute, Civil Defence & Home Guards, Shillong – Meghalaya
- **MoU Signing:** Between SSDMA and NDMA in March 2017
- **District Covered:** East Sikkim (200 volunteers)
- **Volunteer Composition:** NYKS, local volunteers, Sikkim Mountaineering Association, NGOs, QRTs, RS, and NCC cadets
- **Training Module:** Flood management
- **Trainees:** 63 female and 137 male volunteers trained over 12 days

Up-Scaling of Aapda Mitra Scheme (2021):

- **Training Target:** 1,00,000 volunteers across India by March 2023
- **Districts in Sikkim:** West, North, and South (100 volunteers from each district)
- **Volunteer Preference:**

- 20% from NYKS, NCC, NSS, and Bharat Scouts & Guides
- Ex-servicemen, Fire Services, Civil Defence, and Home Guards
- State Government encouraged greater involvement of women volunteers in Disaster Risk Management.

9. Rainfall-Induced Landslide Early Warning System

The SSDMA has collaborated with the Geological Survey of India (GSI) to develop a state-wide Rainfall-Induced Landslide Early Warning System. This initiative aims to predict landslides triggered by heavy rainfall, a common occurrence in the region's monsoon season.

- **System Components:**
 - Collection and analysis of meteorological and geological data.
 - Development of landslide susceptibility maps highlighting vulnerable areas.
 - Issuance of landslide forecasts and warnings by the Central Water Commission (CWC), now operational with experimental bulletins specific to Sikkim.

This system serves as a critical tool in minimizing the impact of landslides by providing communities with advance notice, thereby reducing casualties and property damage.

10. SSDMA web site www.ssdma.nic.in

- **Website Functionality:**

The SSDMA website has been operational for the past decade, providing comprehensive Disaster Management information for Sikkim.
- **Key Features:**
 - ✓ GIS-based Hazard, Risk and Vulnerability Assessment (HRVA) maps of the state and major towns.
 - ✓ Essential contact details, public awareness materials (ICE) details News and Events etc.
- **Website Enhancement Initiatives (2024):**
 - **Incident Reporting Mobile Application:**
 - ✓ Enables real-time disaster data uploads, including images and videos, to enhance response capabilities.
 - **CMS-Integrated Dashboard:**
 - ✓ Centralizes critical data such as relief fund tracking, district-specific disaster statistics, and emergency contact lists.
 - ✓ Supports data-driven decision-making and better disaster management.
- **Alignment with Digital India Initiative:**
 - Promotes administrative efficiency, transparency, and public service delivery across Sikkim.
 - Enhances public access to disaster-related updates, fostering transparency and citizen engagement.

11. Real-Time Landslide Early Warning System at Chandmari, Gangtok

In partnership with Amrita Vishwa Vidyapeetham, South India, SSDMA has implemented a real-time Landslide Early Warning System at Chandmari in Gangtok, East Sikkim. This advanced system is designed to predict landslides with significant lead time, enabling efficient evacuation and disaster response.

- **Technical Specifications:**
 - Installation of sensors that monitor ground movement, moisture content, and other critical parameters.
 - Data processing at the Field Management Center (FMC) in Chandmari, where initial analyses are performed.
 - Transmission of data to the Data Management Center (DMC) at Amrita University, Kerala, for detailed analysis and identification of threshold conditions.
- **Operational Benefits:**
 - Provides 24-hour advance warnings of potential landslides.
 - Enables timely evacuation and risk mitigation measures, ensuring the safety of residents and infrastructure.

This system exemplifies the effective use of technology in disaster management, offering a robust framework for early warnings and preventive actions against landslides.

12. Pilot Project for SNT Landslide Mitigation in Mangan

To address the recurring landslide issues at the SNT site in Mangan town, the district headquarters of North Sikkim, SSDMA has initiated a pilot project aimed at landslide mitigation which has been sponsored by National Disaster Management Authority (NDMA).

- **Technical Approach:**
 - **Piles and Self-Drilling Anchors:** Utilization of structural reinforcements to stabilize the slope and prevent further movement.
 - **Shotcreting:** Application of shotcrete for slope surface protection, enhancing slope stability.
 - **Drainage Solutions:** Implementation of effective drainage systems to manage water flow and reduce soil erosion.

This project represents a multi-faceted approach to landslide mitigation, employing advanced engineering techniques to safeguard the region's infrastructure and populace. The landslide prospect has become useful to control the mass movement of the slope at Mangan. There are proposal being considered in future also to work at the base of the landslide.

13. Deployment of Disaster Response Forces

To enhance on-ground response capabilities, the SSDMA has strategically deployed disaster response forces across Sikkim.

- **National Disaster Response Force (NDRF):**
 - 1 platoon of NDRF is stationed in Pakyong, ready to respond to major disasters.
- **State Disaster Response Force (SDRF):**
 - Home Guard and Civil Defence, (HG&CD) 1 platoon stationed at Gangtok shall cover the whole of Gangtok City.
 - Two Platoons of Sikkim Armed Police, SAP stationed at Pangthang Shall Cover Mangan District, Gangtok District and Pakyong District.
 - Two platoons of Indian Reserve Battalion, IRB under the commandant 2nd Indian Reserve Battalion Stationed at Piple, Mangalbaria Sub-Division Shall cover Soreng District Gyalshing District and Jorethang- Town area.

- Two Platoons of Indian Reserve Battalion, IRB under the commandant 3rd Indian Reserve Battalion at Manglay, Yangang Sub-Division shall cover Namchi District, Singtam- Town and Rangpo- Town.

These deployments ensure that trained personnel are readily available to manage rescue and relief operations efficiently, reducing response time and enhancing the overall effectiveness of disaster management efforts.

NOTE: The number of schemes mentioned above are on the initial mode. Therefore, in the course of the implementation of these schemes, there are ongoing efforts to refine the existing technology and make it more reliant.

Conclusion

The actions taken by the Sikkim State Disaster Management Authority demonstrate a strong commitment to enhancing Disaster Management capabilities in the State. Through strategic collaborations and technological interventions, Sikkim is making significant progress in mitigating the risks associated with natural disasters. However, continuous efforts are needed to address the identified areas for improvement and leverage technological advancements. By doing so, Sikkim can build a resilient disaster management system that safeguards the lives and well-being of its residents, ensuring a proactive approach to disaster preparedness and response.