

Government of Sikkim

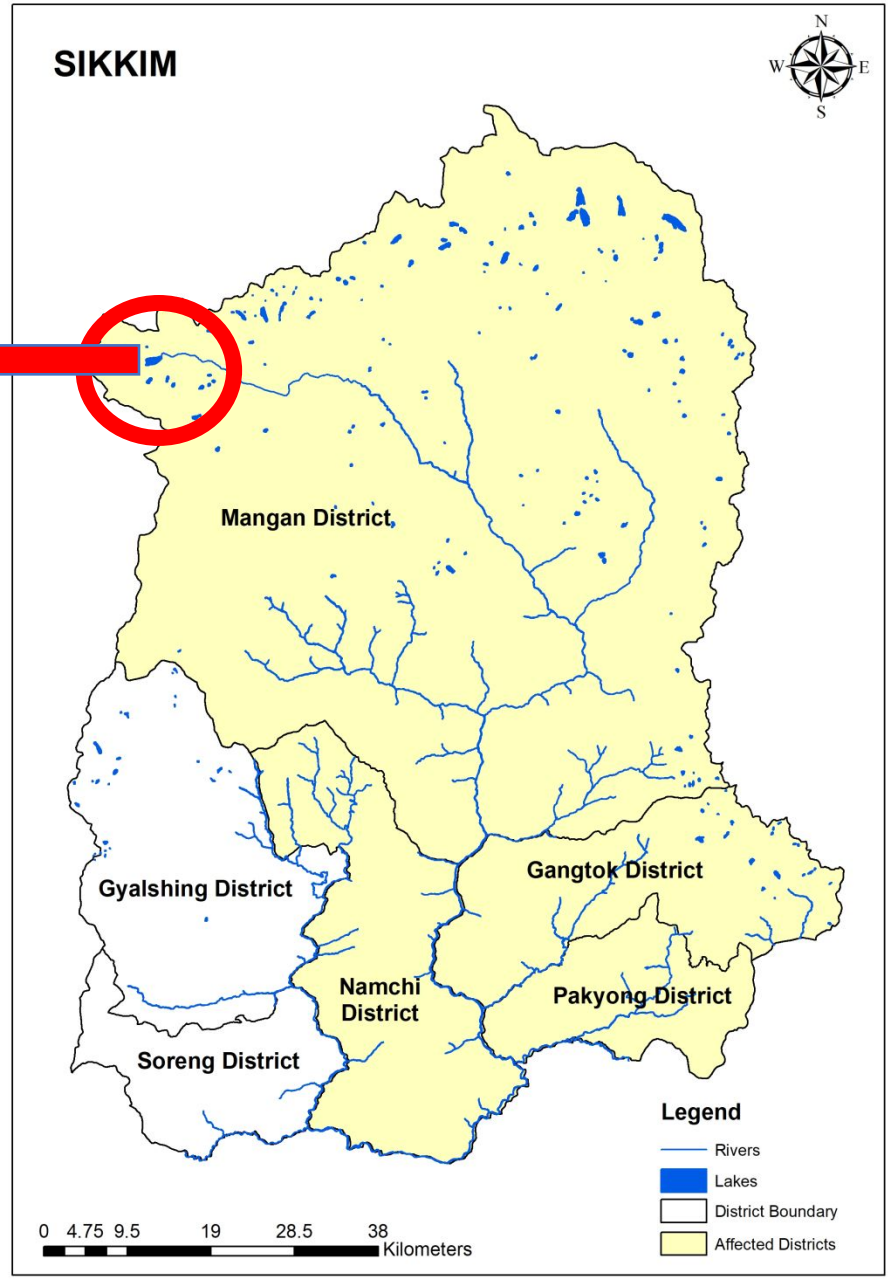
Sikkim Flash Floods - 2023

Sikkim State Disaster Management Authority

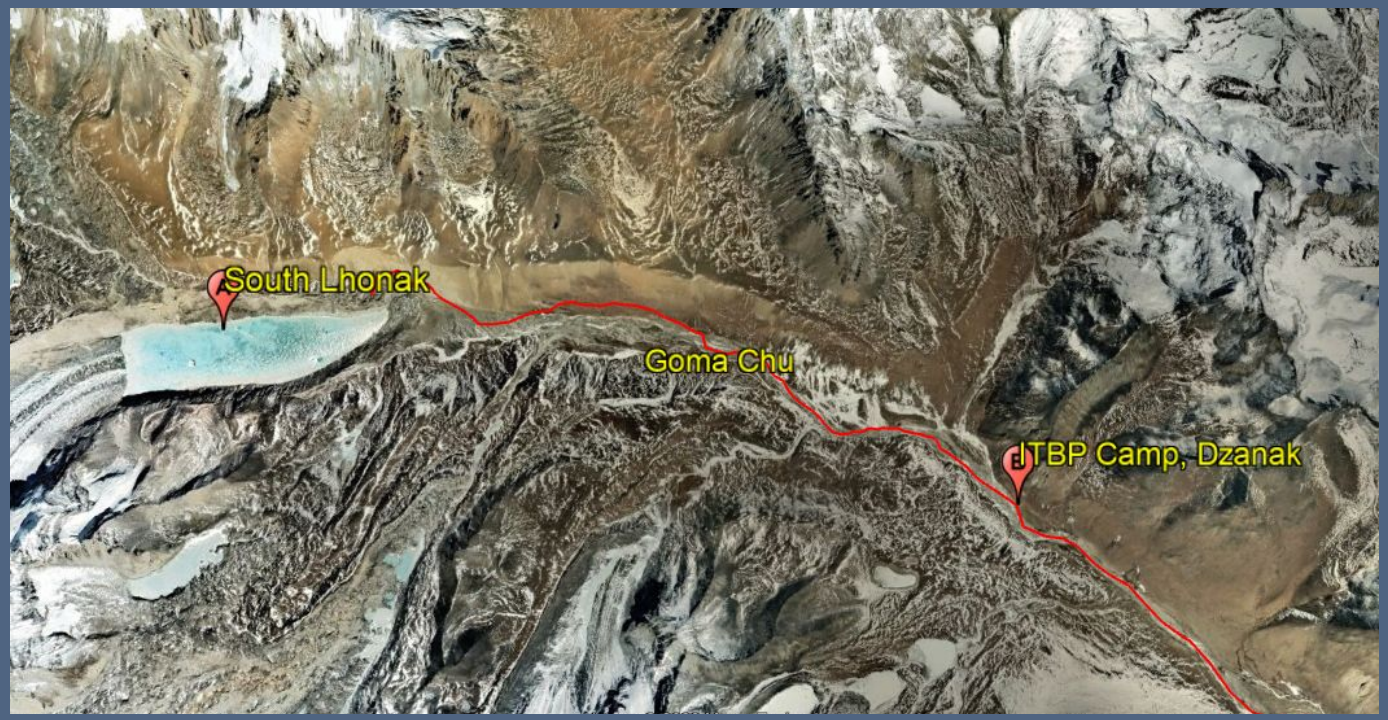
South Lhonak Glacier

Located at North West of Sikkim





First Event Report



Date and Time of First Report: 23:14 Hrs of 3.10.2023

Source of first information: 11th BN of ITBP - Camp Dzanak, Lhonak Valley, Mangan District

Event Reported: Sudden water surge leading to flooding at Goma Chu

Possible triggers

The Weather Research & Forecasting model-based rainfall forecast by NESAC (North Eastern Space Application Centre) states that "it is clear that there was heavy rainfall over large part of Sikkim on 3rd October, 2023 and good amount of rainfall happened over the north- western Sikkim around 22:00 hrs (as seen from satellite-based rainfall product). The condition was favourable for further heavy rainfall over the northern Sikkim area beyond 22:00 hrs and till the lake burst happened."

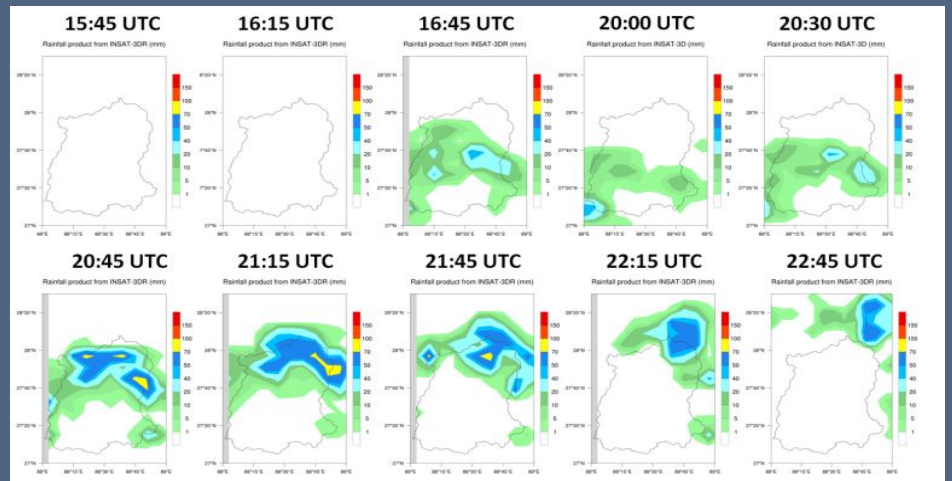
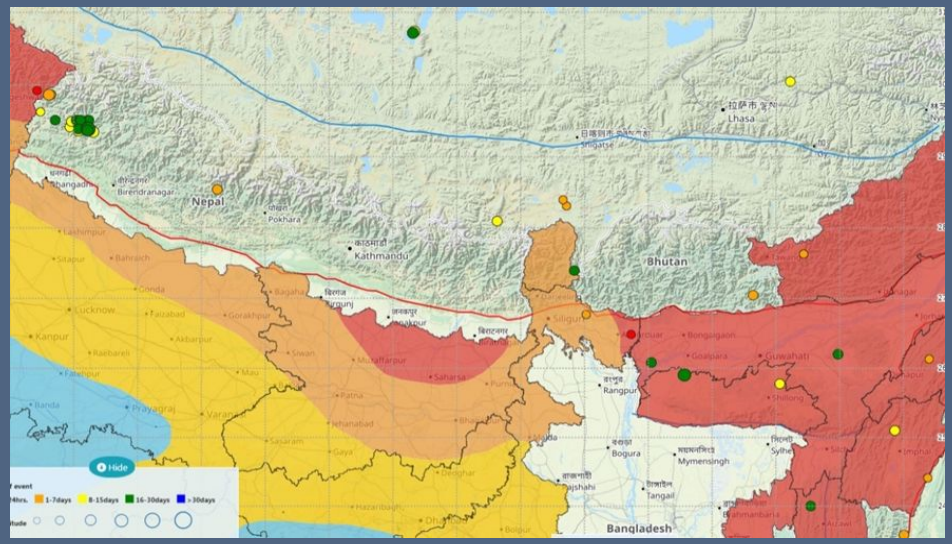


Figure 3: INSAT 3DR HEM products on 3rd October 2023 over Sikkim for different hours (all time are in UTC)

Sl No	Magnitude	Origin Time (IST)	Lat	Long	Depth	Region	Location
1	6.2	2023-10-03 14:51:04	29.39	81.23	5	Nepal	100km ESE of Pithoragarh, Uttarakhand, India
2	4.6	2023-10-03 14:25:52	29.37	81.22	10	Nepal	99km ESE of Pithoragarh, Uttarakhand, India
3	5.2	2023-10-02 18:15:18	25.90	90.57	10	North Garo Hills,Meghalaya	56km NE of Tura, Meghalaya, India

Earthquake activity in the Himalayas, Source: National Centre for Seismology

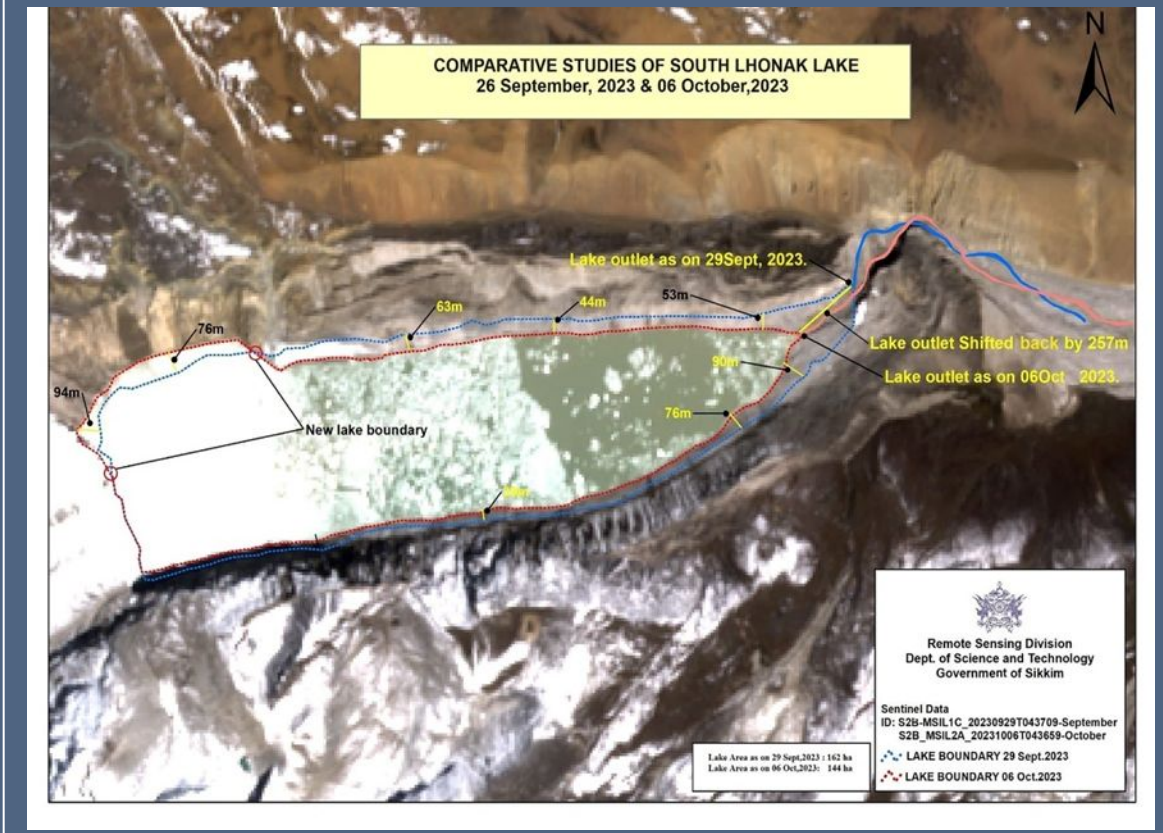


Earthquake activity around Sikkim; Green dots indicate seismic activity before 3rd October 2023

Technical Inputs from Science & Technology Department

As per the latest Sentinel 2 satellite imageries (6/10/2023) of South Lhonak Lake after the flood event, the massive calving of ice approx. 600m (length) x 50m (width) from the snout of South Lhonak glacier is seen. The calving is a continuous process in the snout of the glacier; however, the present calving is very huge.

Further, slope failures/landslides can be seen in the north western part of the lake near the snout. Approximately the moraine measuring approx. 600m (length) x 200m (height) plunged into the lake. Both processes generated extensive waves in the lake that eventually eroded the existing outlet and produced massive floods downstream on 4th October 2023.



Chain of events

First 24 Hours

3rd October, 2023

- District authorities were informed & siren along with public announcements were made to alert residents at downstream areas along the Teesta Basin
- SSDMA/DDMA officials and Officers initiated protocols from respective EOCs
- Immediate evacuation of residents from vulnerable areas to higher ground was ordered
- State Police, SDRF, NDRF, Forest Guards & QRTs with community volunteers activated for search & rescue operations
- Dam authorities were directed to give timely updates of water discharge



Hon'ble Chief Minister with Council of Ministers & senior officers visiting the affected areas on 4.10.2023



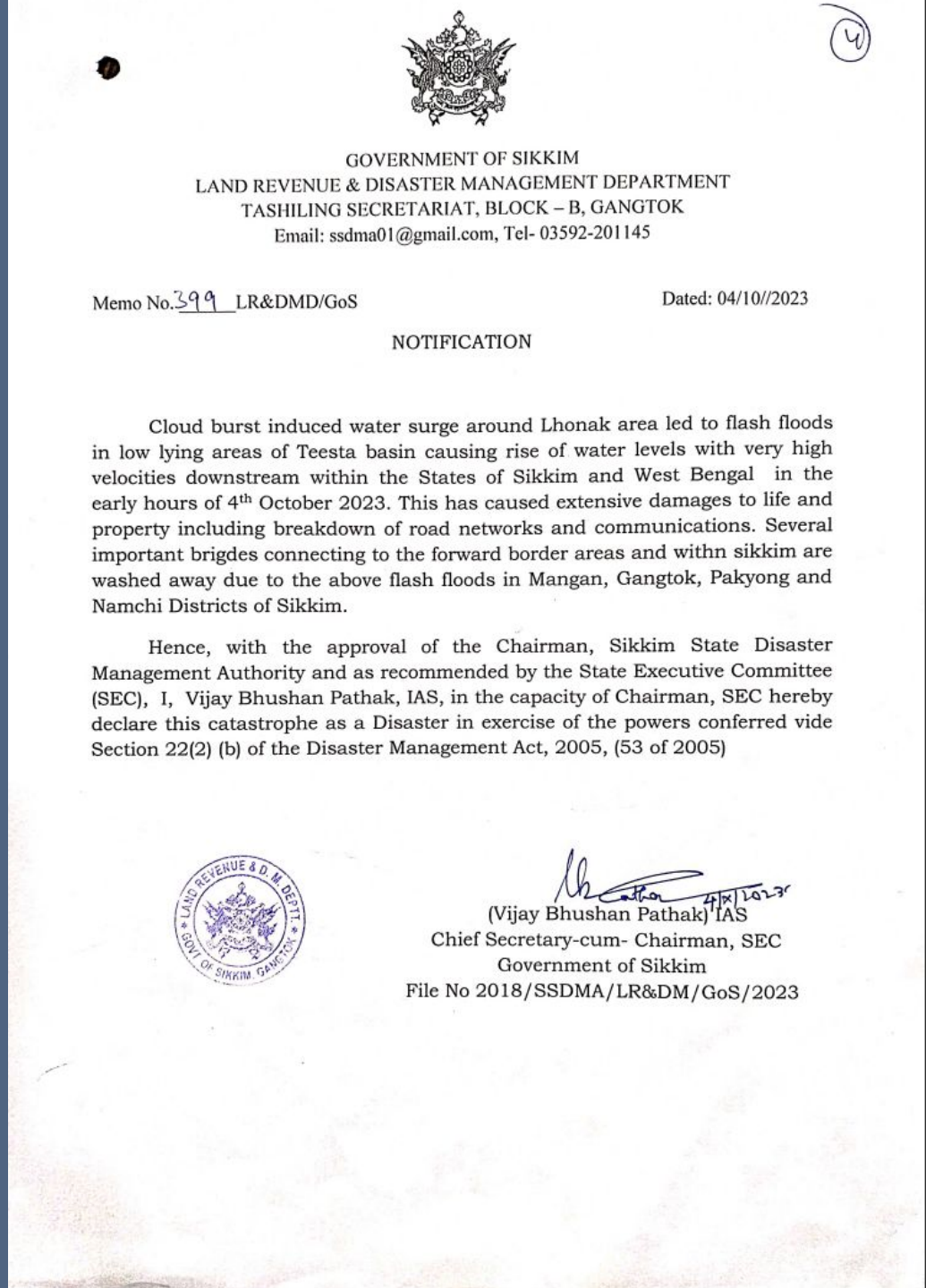
Alert being disseminated around Indreni Bridge, near Adarsh Gaon Singtam which was eventually washed away

Chain of events

First 24 Hours

4th October, 2023

- First Incident Report was sent from State EOC thereafter hourly reports were sent to MHA,NDMA etc.
- Reports of loss of lives and public property along with major bridges and vital installations along the Teesta Basin being washed away was received
- HCM, Council of Ministers, CS, DGP & other senior officers along with elected representatives visited the affected areas under Pakyong, Namchi & Gangtok Districts in the morning hours.
- State Executive Committee, SSDMA under the chairmanship of CS declared



GOVERNMENT OF SIKKIM
LAND REVENUE & DISASTER MANAGEMENT DEPARTMENT
TASHILING SECRETARIAT, BLOCK – B, GANGTOK
Email: ssdma01@gmail.com, Tel- 03592-201145

Memo No.399 LR&DMD/GoS Dated: 04/10//2023

NOTIFICATION

Cloud burst induced water surge around Lhonak area led to flash floods in low lying areas of Teesta basin causing rise of water levels with very high velocities downstream within the States of Sikkim and West Bengal in the early hours of 4th October 2023. This has caused extensive damages to life and property including breakdown of road networks and communications. Several important brigdes connecting to the forward border areas and withn sikkim are washed away due to the above flash floods in Mangan, Gangtok, Pakyong and Namchi Districts of Sikkim.

Hence, with the approval of the Chairman, Sikkim State Disaster Management Authority and as recommended by the State Executive Committee (SEC), I, Vijay Bhushan Pathak, IAS, in the capacity of Chairman, SEC hereby declare this catastrophe as a Disaster in exercise of the powers conferred vide Section 22(2) (b) of the Disaster Management Act, 2005, (53 of 2005)

LAND REVENUE & D. M. DEPTT. GOVT OF SIKKIM, GANGTOK

(Vijay Bhushan Pathak) IAS
Chief Secretary-cum- Chairman, SEC
Government of Sikkim
File No 2018/SSDMA/LR&DM/GoS/2023

Chain of events

First 24 Hours

- State Incident Response System (IRS) was activated, Incident Command Post (ICP) was established at Teesta lounge, Tashiling Secretariat and Emergency Operations Centre of Sikkim State Disaster Management Authority (SSDMA)

- District IRS was simultaneously activated, following ICPs was established: a) Pakyong ICP – Rangpo tourist Lodge, b) Gangtok ICP – Singtam Police Station, c) Mangan ICP – Chungthang Police Station

- Relief Camps were set up at 30 locations in the affected areas of the state





SSDMA, Emergency Operations Centre was the ICP for the State

Search & Rescue – Mangan District

- ITBP posted at Pegong along with Sikkim Fire & Emergency services commenced evacuation & rescue on 4.10.2023
- Team of Sikkim Police led by DIG/Range/North & East was the first to reach Chungthang by foot on 5.10.2023
- SDRF reached Chungthang by foot on 6.10.2023
- One team of NDRF reached Chungthang by foot on 7.10.2023 and started operations
- Another team of NDRF reached Mangan on 8.10.2023 and proceeded to Chungthang on 9.10.2023 while the third team of NDRF was airlifted on 9.10.2023 and started operation
- Heptars were deployed for Air Evacuation of stranded tourists, workers & locals from 9.10.2023

Search & Rescue – Mangan District



Sikkim Police team led by DIG reached Chungthang by foot



Local Volunteers assisting in rescue and evacuation process

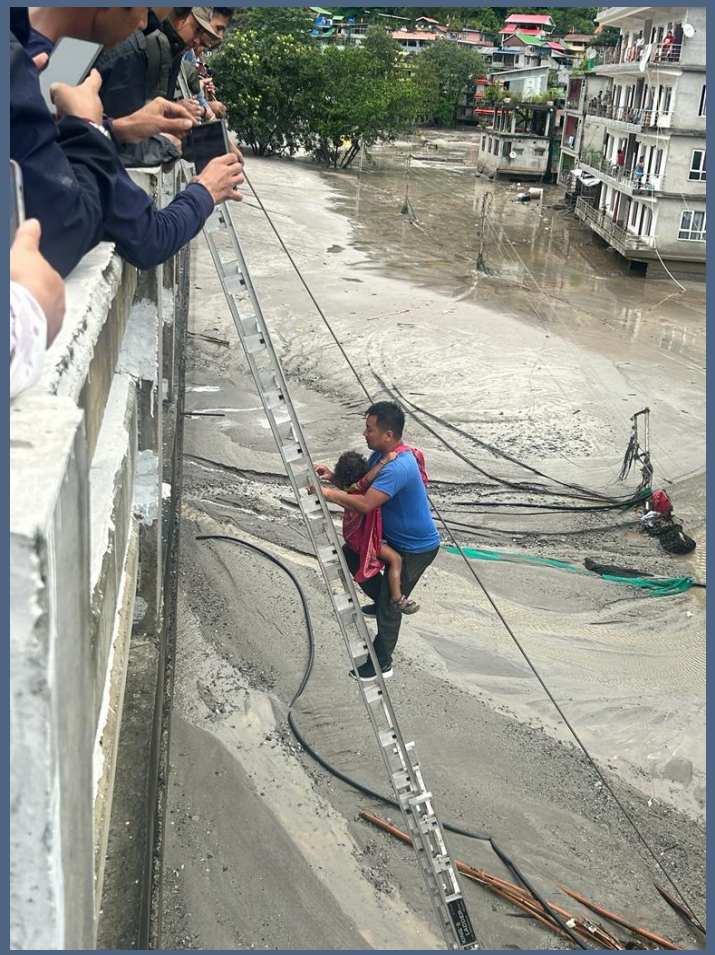


Honble Area MLA using Zipline to reach Chungthang

Search & Rescue – Pakyong, Gangtok & Namchi Districts

- Teams led by District Authorities including Sikkim Police, Sikkim Fire & Emergency Services, NDRF, SDRF, ITBP, Army, Forest Guards, QRTs and local volunteers initiated search & recue operations from the morning hours of 4.10.2023
- District control room numbers were widely disseminated on 4.10.23
- District Hospital emergency units were activated on the morning hours of 4.10.2023
- Electricity and communications were restored on 5.10.2023

Search & Rescue – Pakyong, Gangtok & Namchi Districts



Local volunteers engaged in rescue works



DC, Pakyong inspecting IBM area at Rangpo



DC, Gangtok with DDMA officers inspecting Singtam area



DC, Namchi inspecting Melli area

Evacuation of Tourists from Mangan District

A team of Tourism Department officials were stationed at SSDMA EOC while teams were also dispatched to Lachen, Lachung & Chungthang for safe evacuation of tourists

DATE	NUMBER OF EVACUEES								GRAND TOTAL (Col 5+9)
	EVACUATED BY AIR				EVACUATED BY FOOT				
	DOMESTIC TOURIST	FOREIGN TOURIST	LOCALS	TOTAL (Col 2+3+4)	DOMESTIC TOURIST	FOREIGN TOURIST	LOCALS	TOTAL (Col 6+7+8)	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
05-10-23	0	0	0	0	9	0	0	9	9
06-10-23	0	0	0	0	0	0	0	0	0
07-10-23	0	0	0	0	10	0	0	10	10
08-10-23	0	0	0	0	8	5	2	15	15
09-10-23	467	16	16	499	271	16	110	397	896
10-10-23	153	0	14	167	74	0	0	74	241
11-10-23	0	0	0	0	35	0	0	35	35
12-10-23	361	5	40	406	103	11	0	114	520
13-10-23	292	2	154	448	31	7	0	38	486
TOTAL	1273	23	224	1520	541	39	112	692	2212

Source: Tourism & Civil Aviation Department



Tourists from Mangan District evacuated to Pakyong Airport



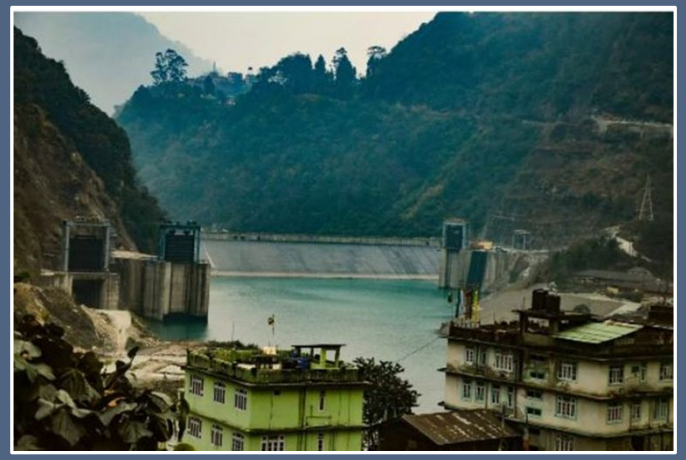
Tourists from Mangan District evacuated to Libing Army Helipad

Details of Major Damages

Sl.No.	Index	Numbers
1	No. of villages affected	100
2	No. of population affected	88400
3	No. of human lives lost	79
4	No. of missing persons	44
5	No. of persons who suffered grievous injury	26 (All discharged)
6	No. of damaged houses	2004
7	Fully and Severely damaged Pucca and Kutcha House	1425
8	Partially Damaged Pucca House	166

Sl.No.	Index	Numbers
9	Partially Damaged Kutcha House	413
10	No. of people rescued	2563
11	No. of people evacuated	5665
12	No. of relief camps opened	30 (All closed)
13	No. of Inmates in Relief camp	7025
14	No. of livestock lost (animal + poultry + others)	31727
15	No. of persons living in Rented houses affected	5019
16	No. of shops affected	922
17	No. of affected bridges	33 (13 Major + 20 Minor)

Major Damages from the State





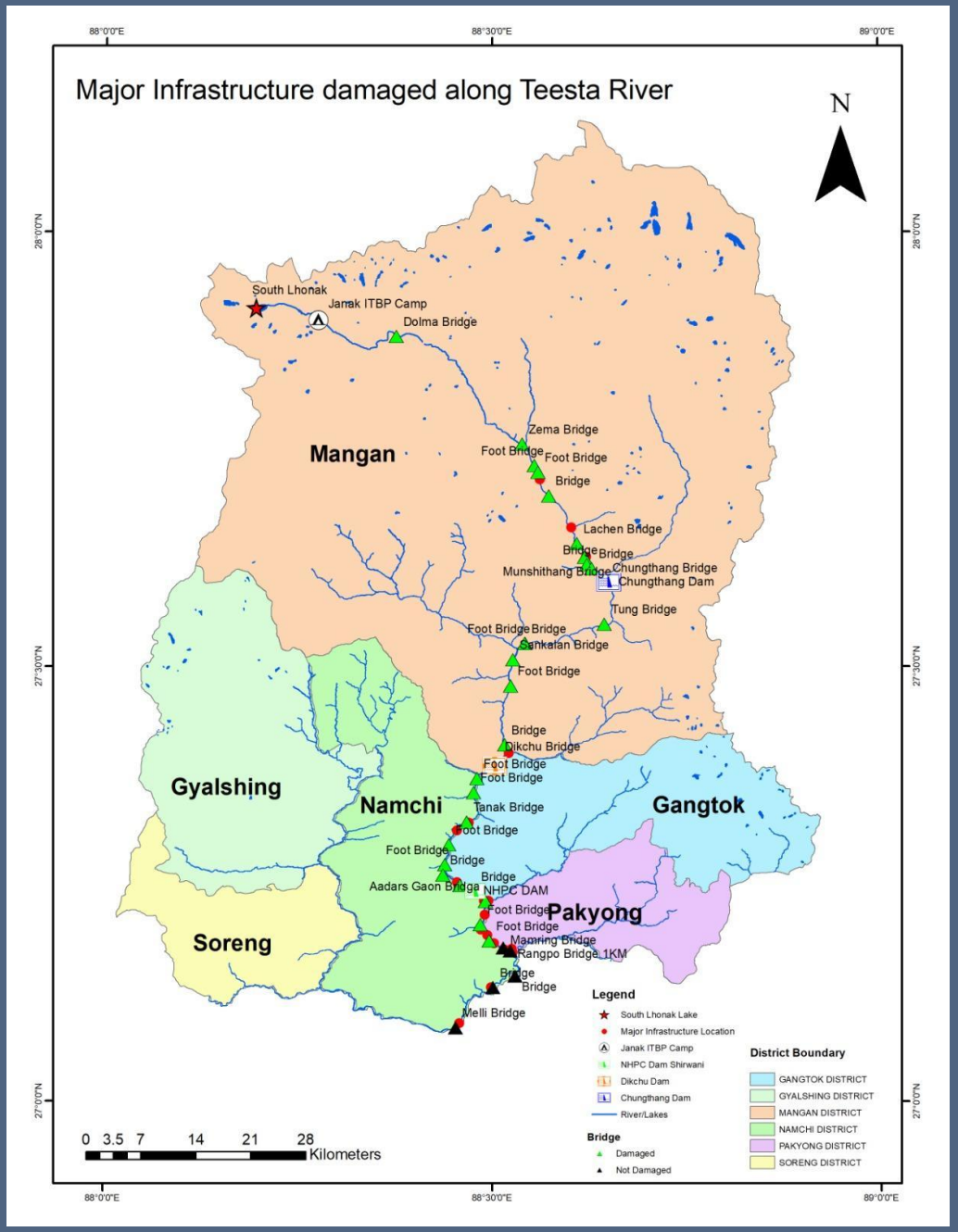
Before & After images of Chungthang Dam



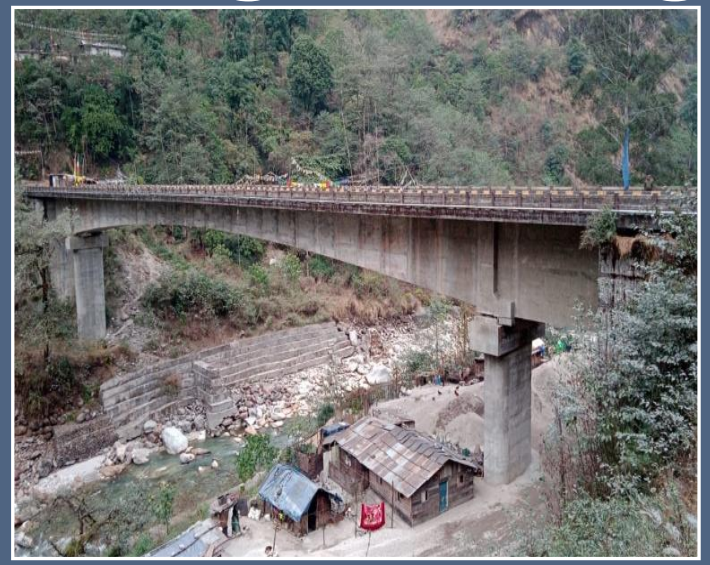
Singtam Area, Gangtok & Namchi Districts



IBM Area, Rangpo, Pakyong District

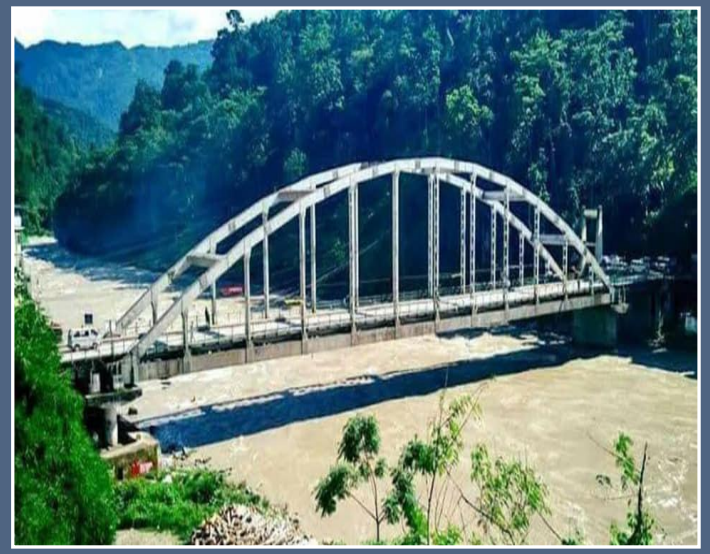


Damages from the affected areas of Mangan, Gangtok & Namchi Districts





Before & After images of Toong Bridge





Before & After images of Indreni Bridge

Damages from the affected districts of Gangtok, Pakyong & Namchi













Relief Measures

- Ex-Gratia to next of kin of deceased and injured disbursed
- Relief with Essential Commodities disbursed to affected people
- Setting of 30 Relief Camps for 7025 affected people : Gangtok District : 10 Relief Camps for 1910 inmates, Pakyong District: 5 Relief Camps for 1677 inmates, Namchi District: 8 Relief Camps for 1088 inmates, Mangan District: 7 Relief Camps for 2350 inmates
- Distribution of clean water to affected areas
- Free transportation to daily wage earners and tourists arranged
- Psychosocial care and counselling provided to trauma victims
- Construction of gender segregated washrooms set up at affected areas
- De-fogging, sanitization & cleaning drives of affected areas frequently done

Relief measures - Glimpses



HCM offering relief to affected citizen



Yoga sessions for inmates of Relief Camps



Daily wage earners ready for free transportation to Siliguri



De-fogging at affected areas



Community kitchen for workers at affected area



Relief materials kept ready for distribution

Relief measures - Glimpses



ADM, Pakyong offering relief to affected citizen

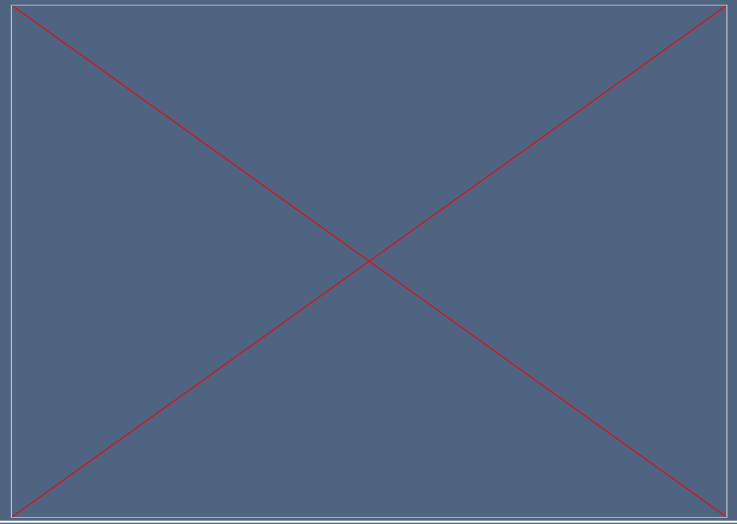


Relief camp at Adarsh Gaon, Namchi District



Relief materials being loaded at Libing Helipad







Relief materials being distributed at various affected locations of the state

Immediate recovery & restoration measures towards rehabilitation

- Re-issuance of lost documents and school uniform with textbooks initiated
- Debris clearance at affected areas initiated
- Construction of traditional log bridges completed
- Construction of Bailey Bridge over Sangkhalang & Chungthang completed by BRO
- Controlled detonation of ammunition by Army initiated
- Communications re-established at key locations with TSPs and VSATs
- Electricity, Water Supply restored at affected locations
- Vital road linkages re-established

Immediate recovery & restoration measures towards rehabilitation - Glimpses



Debris clearance at affected area





Line departments working to restore electricity, water supply and sewerage lines



Essential Commodities being transported via ziplines



Traditional bamboo bridge at Dzongu area



DC, North inspecting the bailey bridge at Sangkalang



Army retrieving the ammunition from river banks

Immediate recovery & restoration measures towards rehabilitation - Glimpses



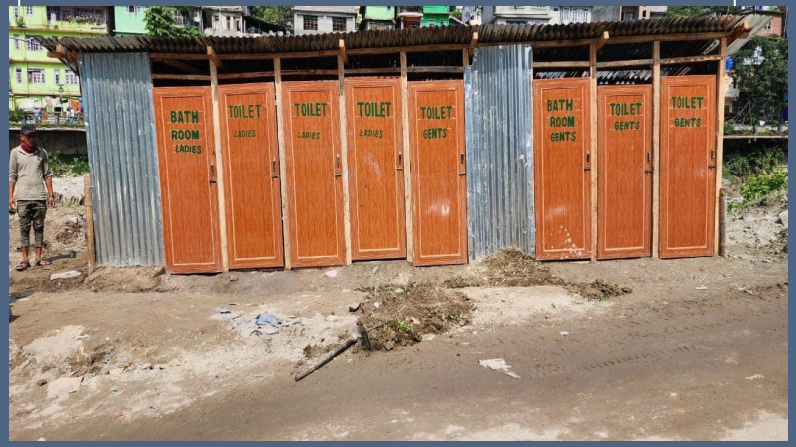
Hon'ble MP handing over re-issued lost documents to affected people



Affected school children being re-issued with text books & uniform



Construction of Bailey Bridge by Army



Temporary Toilets constructed at affected areas



Sanitization drive at affected areas



Relief Material being air lifted

Notifications issued for immediate compliance

Sl. No.	Date	Details
1.	4th October 2023	Notification issued by the Chief Secretary cum Chairman, SEC of SSDMA with the consent of the Chairman, SSDMA declaring the cloud burst induced water surge around Lhonak Lake on 4th October 2023 as a Disaster.
2.	5th October 2023	Advisory issued by Relief Commissioner warning the local public about the ammunitions that might be found along the Teesta Basin.
3.	6th October 2023	O.O issued by the Relief Commissioner constituting Debris Clearance teams headed by the ADCs of the respective districts for Singtam and Rangpo.
4.	6th October 2023	O.O issued by the Relief Commissioner constituting Relief and Rescue Team for Mangan District. The team is headed by Secretary, RDD Shri Tshewang Gyachho, IAS.
5.	6th October 2023	O.O issued by the Relief Commissioner directing Urban Development Department to constitute a team for drainage of flood water from affected areas of Singtam and Rangpo.
6.	6th October 2023	O.O issued by Relief Commissioner for deployment of NDRF.
7.	6th October 2023	O.O issued by Relief Commissioner informing Search & Rescue Teams about explosives and ammunitions that may be found while undertaking Search & Rescue Operations.
8.	6th October 2023	Circular issued by Relief Commissioner directing District Collectors to nominate Nodal Officer for submission of Daily Situational Report.
9.	6th October 2023	O.O issued by Relief Commissioner adding Shri Yeshey Tshewang, IPS Director, Bureau of Prosecution as a member of the Relief & Rescue Team already constituted.
10.	6th October 2023	O.O issued by Relief Commissioner entrusting Secretary, Social Justice and Secretary, Women & Child Development Department for procurement of clothing items for the affected populace of Chungthang.

Notifications issued for immediate compliance

Sl. No.	Date	Details
11.	7th October 2023	O.O issued by the Relief Commissioner stating that NDRF will proceed by road to Chungthang. The NDRF will be under the control of DIGP Range Shri Tashi Wangyal Bhutia, IPS.
12.	7th October 2023	O.O issued by the Relief Commissioner designating Ms Sonam Lachungpa, CDPO Women & Child as the Nodal Officer for distribution of Relief Materials at Chungthang.
13.	7th October 2023	Advisory issued by the Relief Commissioner directing District Authorities to carry out miking warning the local public not to venture in the area around the river belt areas of Teesta Basin as it could contain ammunition.
14.	8th October 2023	O.O issued by Director, SSDMA constituting team led by Joint Secretary, LRDMD for collection, distribution and monitoring of Relief Materials.
15.	9th October 2023	O.O issued by Relief Commissioner nomination Shri Mohan Bhattarai, Jr Accountant, LRDMD as the Co-ordinator for overseeing the dispatch of relief materials at Pakyong Airport.
16.	10th October 2023	O.O issued by Relief Commissioner constituting a Co-ordination Committee to finalise the location for construction of suspension Bailey Bridge.
17.	10th October 2023	O.O issued by Relief Commissioner stationing officers at Lachen & Lachung for evacuation of stranded tourists and local people at Mangan District.
18.	10th October 2023	In partial amendment to O.O issued by Relief Commissioner stationing officers at Lachen, Lachung & Chungthang for evacuation of stranded tourists and local people.
19.	11th October 2023	O.O issued by Relief Commissioner appointing Nodal officers to deal with grievances of people of Dzongu, Lachen, Lachung & Chungthang.
20.	11thOctober 2023	O.O issued by Chief Secretary designating Shri Rinzing Chewang Bhutia, IAS, Secretary, P&D Deptt as official spokesperson for media briefing.

Notifications issued for immediate compliance

Sl. No.	Date	Details
21.	12th October 2023	O.O issued by Relief Commissioner regarding adding Dr. Karma T. Bhutia as a member of team constituted for overseeing the Relief and Rescue Operation at Mangan District.
22.	16th October 2023	O.O issued by Relief Commissioner for distribution of Relief Materials in affected areas of Mangan district
23.	18th October 2023	Advisory issued by RC regarding collection of relief
24.	28th October 2023	O.O issued by Relief Commissioner for locating suitable land for re-location of the infrastructures.
25.	30th October 2023	ADDENDUM issued by Relief Commissioner for locating suitable land for re-location of the infrastructures.

Central Government Meetings & Visits

- National Crisis Management Committee chaired by Cabinet Secretary met on 5.10.2023 & 9.10.2023
- Director General, BRO visited the affected areas on 6.10.2023
- Union Minister of State for Home Affairs visited the affected areas on 7.10.2023
- Inter Ministerial Central Team visited the affected areas on 8.10.2023 & 9.10.2023
- Chief of Army Staff visited the affected areas on 9.10.2023
- NDMA team led by Member Secretary visited the affected areas on 18.10.2023
- Union Power Minister chaired a meeting on 18.10.2023

Central Government Officials Visits & Meetings



Visit of Union Minster of State, Home to the affected areas



National Crisis Management Committee Meeting chaired by Cabinet Secretary



IMCT visiting the affected areas

Central Government Officials Visits & Meetings



Meeting with Union Power Minister



Director General, BRO along with Other Officers meeting the HCM



Meeting of Member Secretary, NDMA with HCM

Emergency Cabinet Announcements

- Sikkim Punarwas Awas Yojana in which 2100 new houses to be constructed
- Sikkim Janta Housing Colony in which 2000 houses to be constructed for tenants
- Relief camp inmates will be granted Rs. 5000/month for three months
- Affected students to be provided one time grant of Rs. 10000 for purchase of books & uniforms
- To constitute Technical Committee consisting of experts to look into the cause of the recent disaster and mitigation measures thereof
- Loan moratorium for affected business owners



Hon'ble Chief Minister and Chief Secretary attending the emergency cabinet meeting

Government of Sikkim Initiatives on GLOF management

- Nine number of expeditions to South Lhonak took place from 2012 – 2025. Team members comprised of Central Government Agencies, Army, ITBP, Scientists, Geologists, Glaciologists, State Government Officials, Swiss Experts, etc.
- Expeditions focussed on study of the lake moraine, depth and other parameters as well as mitigation through siphoning as was recommended by scientists
- Last expedition focussed on installation of automatic weather station system at South Lhonak & Shako Cho and study of key parameters to install suitable Early Warning System in the upcoming expeditions

Government of Sikkim Initiatives on GLOF management



Yaks being deployed to carry pipes



View of the terminal moraine and the outlet



Pipes being installed for siphoning



Manual clearing of debris from the outlet



Additional water being siphoned off the glacial



Outlet cleared of debris and additional pipeline installed

Government of Sikkim Initiatives on GLOF management



Installed Monitoring Station at South Lhonak by a team from NDMA – SSDMA – SDC at South Lhonak lake, expedition was from (9th -19th September, 2023).

Government of Sikkim Initiatives on GLOF management

- Sikkim State Disaster Management Authority with the District Disaster Management Authorities and other stakeholders has conducted:

a) Awareness and sensitisation programmes at all vulnerable downstream locations: Chungthang, Phidang, Mangan, Dikchu, Singtam, Rangpo & Melli

b) Basic Search, Rescue and First Aid Training was imparted to volunteers

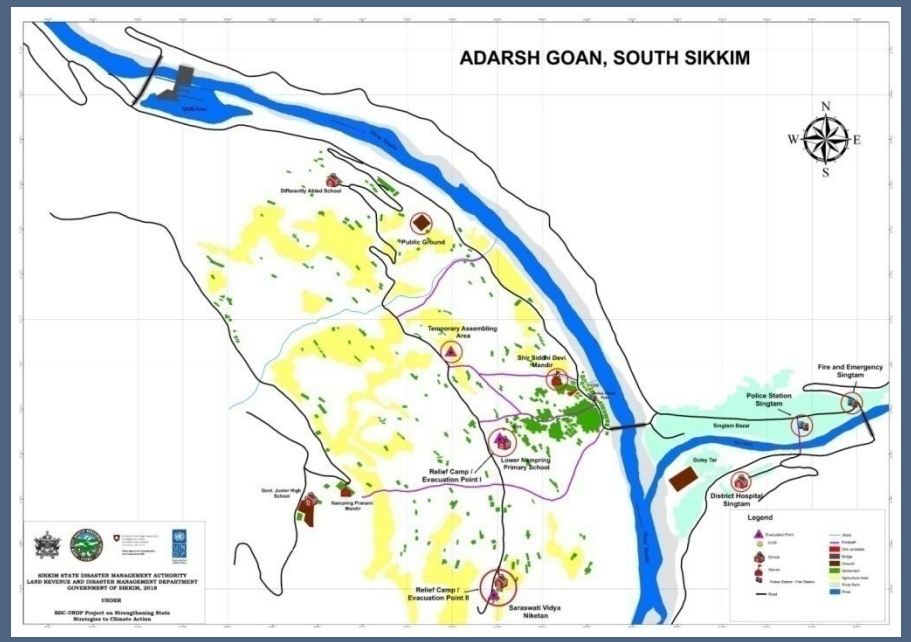
c) Participatory Rural Appraisal to map the hazards and associated risks was completed

d) Evacuation maps was prepared and shared with all key stakeholders

e) State Level Mock exercise on Earthquake triggered GLOF was conducted on May, 2023

f) Chungthang Sub-Division Office with SUL conducted Mock Drill on GLOF on 18.09.2023

Government of Sikkim Initiatives on GLOF management



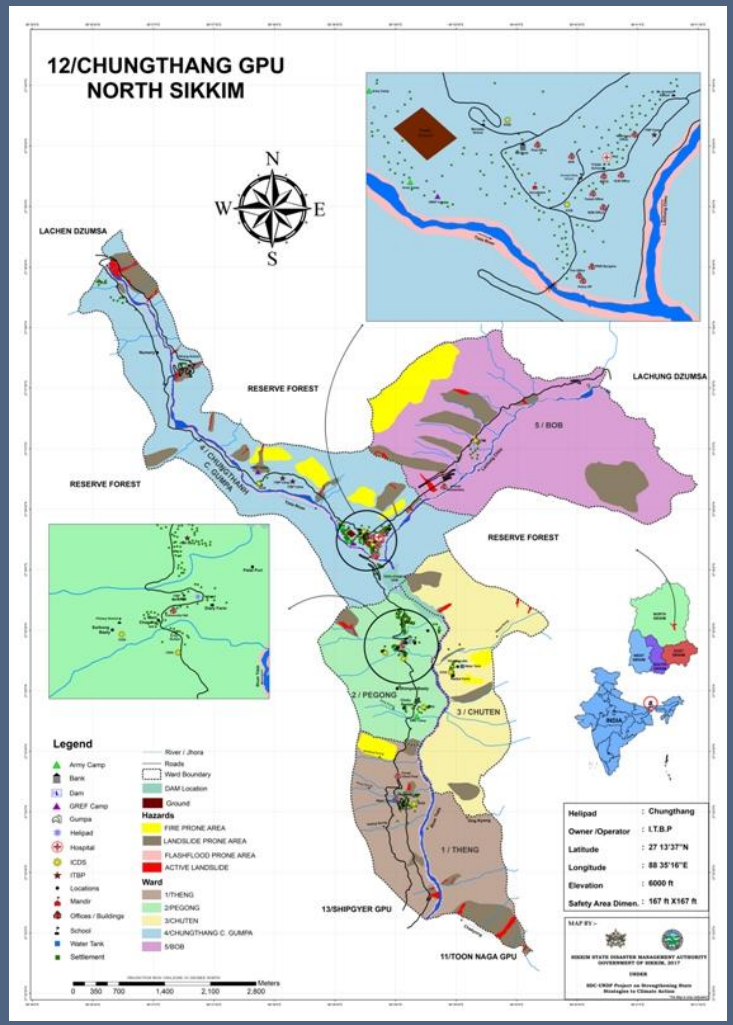
Evacuation map for Adarsh Goan on 21.02.2018, Gangtok District



NDRF team training volunteers at Adarsh Goan on 21.02.2018, Gangtok District



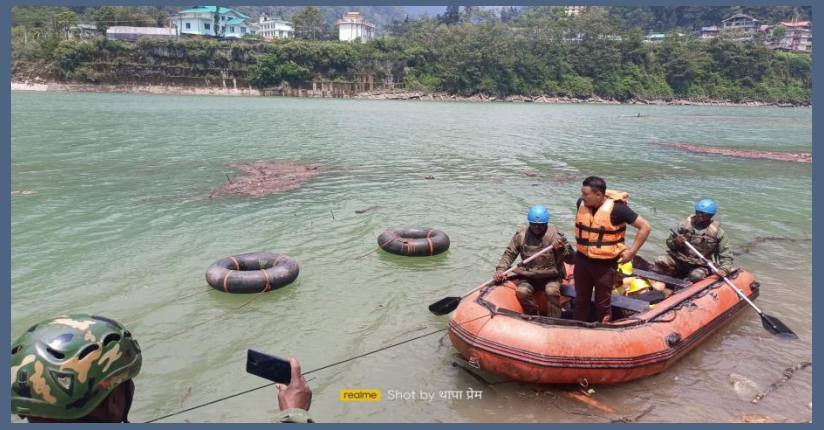
Awareness of GLOF at Phidang on 19.03.2018 by SSDMA & DDMA, Mangan District



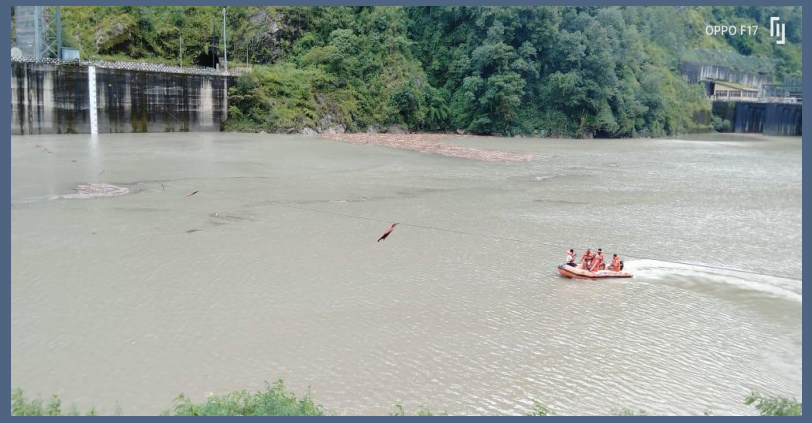
HRVC of Chuangthang GPU on 23.03.2018, Mangan District

Government of Sikkim Initiatives on GLOF management













Mock Drill on GLOF held at SUL Dam site, Chungthang on 18th September 2023.

State Level Mock Drill on 6.9 RS Earthquake induced GLOF Scenario held on 12th May 2023

Monsoon Preparedness measures



SSDMA holds pre-monsoon preparedness meeting with disaster management nodal officers



GANGTOK, May 15 (IPR): Sikkim State Disaster Management Authority (SSDMA) convened a meeting to discuss pre-monsoon preparedness with nodal officers of disaster management at a local hotel in Gangtok today.

The meeting had the presence of nodal officers from SSDMA and DDMA of all line departments and other dignitaries.

In his address, Prabhakar Rai, special secretary-cum-director, SSDMA, emphasised the importance of enhancing coordination among nodal officers to ensure systematic workflow during disasters. He stressed the necessity for seamless communication between directives and plan execution during natural calamities.

Moreover he mentioned the need to include disaster management in school curriculum and to constitute a disaster management club.

Additionally, he addressed concerns raised by various departments and provided insights into departmental strategies and initiatives.

Parina Gurung, additional secretary, SSDMA, during her presentation, emphasised the importance of proactive preparedness for potential calamities. She provided detailed insights into building resilience, including the formulation of evacuation strategies for 19 high-risk locations along the Teesta basin.

Additionally, she discussed the Incident Response System, underscoring the crucial role of SSDMA, and elaborated on the functions of the State Emergency Operation Centre (SEOC) and the Emergency Response Support System.

Subsequently, she elaborated on the roles of concerned departments in disaster preparedness, ensuring opportunities for further improvement.

Dinesh Dhakal, assistant urban planner, SSDMA, elaborated on the upcoming programme to enhance the resilience of vulnerable communities along the Teesta River basin. Additionally, he stressed the importance of using Participatory Rural Appraisal (PRA) tools for collaborative mapping in efforts to reduce disaster risk.

The session also included an interactive session.

Earlier the welcome address was presented by Kessang Nima Bhutia, assistant director, SSDMA. The vote of thanks was delivered by Ada Lawrence, IT specialist, SSDMA.

MONSOON PREPAREDNESS: Evacuation routes being drawn for vulnerable Teesta river settlements

CWC constantly monitoring Sikkim rivers, revise warning levels

BIJOY GURUNG



A Participatory Rural Appraisal (PRA) exercise being conducted by the SSDMA and DDMAs to prepare evacuation maps during the awareness camp held at the vulnerable locations along the Teesta river basin.



Teesta river in spate as it flows past Melli bazaar following heavy rains upstream on Saturday afternoon. The water level was 224.96 m and falling as of Sunday afternoon but was close to the danger level of 227 m. The CWC has revised warning levels for Teesta river following morphology changes since last October flash flood.

GANGTOK, May 19: Sensitization camps and setting up of evacuation strategies have been initiated by the Sikkim State Disaster Management Authority (SSDMA) for around 19 locations along the Teesta riverine belt identified as vulnerable during this approaching monsoon.

The degree of vulnerability varies location-wise but in general, these settlements close to Teesta River stare at increased threats to life and properties due to two major concerns. It would be the first monsoon after October 2023 flash flood which has bulked the Teesta river bed and made its flow unpredictable. Secondly, heavy rainfall events are expected to swell the river level with no dams in operation to check Teesta River's flow this above-normal monsoon.

The SSDMA along with local authorities have already completed monsoon-related awareness camps for Melli, Chungthang and Phidang, where they also held Participatory Rural Appraisal (PRA) for the local populace to pencil the best evacuation routes in case of flood threats in these vulnerable locations.

As SSDMA authorities explain, PRA is done in consultation with the local people to draw a map of local important sites like schools, police station, BAC and food godowns. The most important objective of PRA is to tell the people where to go during threats of natural calamities, and to draw the best and quickest route to the identified safe locations and relief centres. Schools in the area are already designated as relief centres during such incidents.

Some of the Teesta belt locations where evacuation maps are to be framed during PRAs are Sangakalang (Dzongu), Dikchu, Singtam, Adarshgaon, Mamring, Samardong, Golitar, Rangpo IBM, Bageykhola, Bardang, Majhitar and Sirwani. All these settlements are close to the Teesta river.

One strong advisory is that people should be cautious while approaching the rivers, since heavy upstream rains leads to sudden rise in the water levels as it happened on Saturday evening. Three persons had ventured into the river for fishing but were marooned in the middle of Rangpo river on the West Bengal side due to intense rains. They were later successfully evacuated by the rescue teams.

Instances of sudden increase in the river's flow are expected to happen regularly in coming three months. On this concern, the Central Water Commission (CWC) is constantly monitoring the water levels and working closely with the State authorities for giving timely flood alerts through its three Level Forecasting Sites (LFS).

The CWC has installed one LFS each at Melli for Teesta river, Rothak for Rangit river and Singtam for Rani Khola. Despite the heavy downpour of Saturday, the three rivers are flowing below their warning levels at their respective LFS, as per the CWC data of Sunday afternoon.

"We are monitoring the water levels of the rivers of Sikkim every hour and sharing the updates with the State and district authorities. If there is any abnormal rise, it will be immediately communicated to the authorities," said CWC officials to SIKKIM EXPRESS.

Meanwhile, the warning levels of the rivers in Sikkim have been revised by the CWC following the October 2023 flash flood. We have revised the warning level tentatively based on the Teesta river's morphology change, siltation and the new heights the river bed has reached...the flood forecast will be on these updated levels, said the CWC officials.

The CWC operates 14 hydrological observation sites in Teesta and Rangit rivers, and their tributaries.

The CWC has suggested to the Sikkim government certain structural and non-structural measures to address the flood and erosion-related challenges in Teesta river during monsoons.

On structural measures, it was suggested to install embankments and anti-erosion flood protection walls on the river banks so that Teesta river do not breach into human settlements and properties.

One particular suggestion made by the CWC was to frame floodplain zoning regulations along the riverine belts. Under this concept, activities are to be regulated in the river's vicinity wherein certain activities are permitted or not permitted at specific distances from the river banks to prevent loss of lives when flash flood breaks out.

This suggestion, as informed, is at present in a discussion stage.





HRVA cum PRA exercise for 19 vulnerable villages along Teesta River

MONSOON PREPAREDNESS: Evacuation routes being drawn for vulnerable Teesta river settlements

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SSDMA holds monsoon sensitization for Golitar residents

PAKYONG, May 21 (IPR): The Sikkim State Disaster Management Authority (SSDMA), in collaboration with the District Disaster Management Authority (DDMA) Pakyong, conducted the second day of a comprehensive training programme focusing on enhancing the resilience of vulnerable communities located within the Teesta Basin.

The training session took place at Golitar, Singtam, bringing together key stakeholders and officials to discuss and implement strategies for disaster preparedness and response in the region.

Chaired by representatives from various organisations, including panchayat at Golitar, AE Water Resources Engineering department, AE, BAC Duga, [illegible], East Point School, [illegible] Pakyong, the event witnessed active participation from a diverse range of sectors, including school students.

The collaborative effort aimed to equip individuals and communities with the necessary skills and knowledge to effectively respond to and mitigate the impact of disasters.

Dinesh Dhakal, assistant Urban Planner, SSDMA, spearheaded this initiative by leading a team of SSDMA officials through a training session.

The programme emphasised the importance of proactive planning, early warning systems, and community involvement in building resilience against natural calamities such as floods, landslides, and other hazards prevalent in the region. Through interactive workshops, simulations, and group discussions, participants were able to enhance their understanding of disaster risk reduction techniques and best practices.

The training also highlighted the significance of cross-sectoral collaboration, coordination, and communication in effectively responding to emergencies and ensuring the safety and well-being of the community.





SSDMA holds monsoon preparedness awareness drive at Rangpo

PAKYONG, May 20 (IPR): The Sikkim State Disaster Management Authority (SSDMA), in collaboration with the District Disaster Management Authority (DDMA) Pakyong, organised a training programme focused on enhancing the resilience of vulnerable communities within the IBM and Rangpo areas, led by Dhendup Lepcha along with Dinesh Dhakal, Assistant Urban Planner, SSDMA, wherein an awareness camp and Participatory Rural Appraisal (PRA) exercise were carried out in the IBM and Rangpo areas.

The primary objective of the awareness program is to mitigate the loss of lives and property caused by natural and man-made disasters in Sikkim. This involves strategic planning, comprehensive risk assessment, and effective implementation of disaster management initiatives.

The coordination with various stakeholders and institutions, continuous research into innovative methods and technologies, and the establishment of a unified command structure for efficient resource allocation are the key components of this program. It also emphasises the importance of providing prompt relief, effective rehabilitation, and sustainable reconstruction efforts for the affected communities.

Moreover, the attendees were briefed on various methods to mitigate Glacial Lake Outburst Flood (GLOF) occurrences, such as controlled breaching, construction of outlet control structures, water pumping or siphoning, and tunnel construction through moraine barriers, among others.

These methods entail physical interventions like blasting, excavation, or aerial explosives for controlled breaching, and the use of robust structures like stone, concrete, or steel for outlet control construction.

Nevertheless, the logistical challenges associated with construction and repairs at high altitudes, challenging terrain, and remote locations are significant. Water pumping or siphoning operations require substantial electricity consumption for powerful pumps, making them financially intensive.

Continuous physical monitoring of dams, lakes, and glaciers, as well as their surroundings at different intervals is essential before, during, and after the mitigation procedures to effectively minimise the risk of GLOF events and safeguard critical infrastructure from potential damage.

It is noteworthy that the SSDMA is executing, in conjunction with the DDMA, is conducting an awareness camp and Participatory Rural Appraisal in the Teesta Basin, focusing on vulnerability to upcoming monsoons from May 17 to May 30. The awareness campaign in the Rangpo/Bardang will unfold in three phases, with today marking the commencement of the initial phase.

Following the PRA Exercise, the SSDMA is gearing up to develop evacuation maps for strategic planning purposes. The active involvement and cooperation of the general public are encouraged to ensure the success of these maps, contributing towards the formulation of evacuation plans essential for their respective areas.

Along with officials from SSDMA, the program included councillors, DI, RDO, MDO Rangpo, District Fire Officer, Rangpo, BRO, WRD, Adhu workers, SGO, police, and forest personnel, as well as students and the general public.



SSDMA holds pre-monsoon preparedness meeting with disaster management nodal officers

GANGTOK, May 15 (IPR): Sikkim State Disaster Management Authority (SSDMA) convened a meeting to discuss pre-monsoon preparedness with nodal officers of disaster management at a local hotel in Gangtok today.

The meeting had the presence of nodal officers from SSDMA and DDMA of all line departments and other dignitaries.

In his address, Prabhakar Rai, special secretary-cum-director, SSDMA, emphasised the importance of enhancing coordination among nodal officers to ensure systematic workflow during disasters. He stressed the necessity for seamless communication between directives and plan execution during natural calamities.

Moreover he mentioned the need to include disaster management in school curriculum and to constitute a disaster management club.

Additionally, he addressed concerns raised by various departments and provided insights into departmental strategies and initiatives.

Parina Gurung, additional secretary, SSDMA, during her presentation, emphasised the importance of proactive preparedness for potential calamities. She provided detailed insights into building resilience, including the formulation of evacuation strategies for 19 high-risk locations along the Teesta basin.

Additionally, she discussed the Incident Response System, underscoring the crucial role of SSDMA, and elaborated on the functions of the State Emergency Operation Centre (SEOC) and the Emergency Response Support System.

Subsequently, she elaborated on the roles of concerned departments in disaster preparedness, ensuring opportunities for further improvement.

Dinesh Dhakal, assistant urban planner, SSDMA, elaborated on upcoming programme to enhance the resilience of vulnerable communities along the Teesta River basin.

Additionally, he stressed the importance of using Participatory Rural Appraisal (PRA) tools for collaborative mapping in efforts to reduce disaster risk.

The session also included an interactive session.

Earlier the welcome address was presented by Kesang Nima Bhutia, assistant director, SSDMA. The vote of thanks was delivered by Ada Lawrence, IT specialist, SSDMA.



Monsoon preparedness drive in Adarsh Gaon



SE Report

GANGTOK, May 22: The Sikkim State Disaster Management Authority (SSDMA), in collaboration with the District Disaster Management Authority (DDMA) Namchi, successfully conducted the fifth day of a comprehensive training programme aimed at enhancing the resilience of vulnerable communities situated within the Teesta Basin.

The fifth day of the awareness and training programme, focused on Glacier Lake Outburst Floods (GLOF) and Participatory Rural Appraisal (PRA) exercises. The team was led by Jigme Bhutia, Deputy director of SSDMA, and Dinesh Dhakal, assistant Urban Planner of SSDMA.

The session was attended by various stakeholders including representatives from Panchayat Adarsh Goan, members of the Mandir committee, the District Forest Officer (DFO) Namchi, Junior Engineer (JE) from the Water Resources Department, officials from SSDMA, and local residents.

A practical session on PRA was conducted by local residents to prepare an evacuation plan specifically tailored for Adarsh Goan, emphasising community involvement in disaster preparedness and response efforts.

This collaborative initiative underscores the commitment of SSDMA and DDMA Namchi towards building resilient communities capable of effectively responding to and mitigating the impact of natural disasters, a press release informs.

I COMMISSIONER,
GANGTOK.
AN ACT
son of Achhey Lepcha, aged
Buddhist, by occupation-

Post Disaster Needs Assessment

- Post Disaster Needs Assessment (PDNA) for Sikkim Flash Floods 2023 was conducted by SSDMA in coordination with NDMA from 7th to 11th December, 2023.

- A multi stakeholder State –level co-ordination team consisting of external experts, sector experts, representatives from the Government, scientific institutions and other international agencies like UNICEF, CDRI, BRO and WFP was constituted.

- PDNA was conducted in 3 phases
  - Data collection from 18th Nov to 5th Dec, 2023
  - PDNA field visit of 16 external experts and 8 state sectoral experts from 7th to 11th December, 2023
  - PDNA report finalized and submitted to MHA.



PDNA field visit - Chungthang



PDNA field visit at Phidang.

Glimpses of PDNA field visit













Debriefing meeting of PDNA exercise on 11th December, 2023



External experts (PDNA team)- Meeting with the HCM

Challenges

- There was no road connectivity to Chungthang, Lachung, Lachen and adjacent villages along and beyond them
- A fleet of heptars was kept ready at Bagdogra & Chatten for rescue & relief however due to inclement weather conditions it could not take off till 9.10.2023
- NDRF could not immediately reach the affected areas at Chungthang and beyond
- Communications with Chungthang & beyond could not be established immediately
- Army explosives from Munsithang was washed away with live explosives scattered along the Teesta basin posing immediate threat to the public also hampering relief & rescue efforts
- The siren/alarm system from the Dams could not be understood because of the roaring Teesta river
- The Covid-19 period did not have any activity related to GLOF Mitigation & Preparedness

Learnings

- Necessary to establish an integrated and robust EWS along the Teesta Basin with a three grade alarm system with different siren sounds
- Enhance the capacity of SDRF in line with NDRF and place them under DDMA
- Install appropriate warning signs at relevant locations along the basin
- Develop an AI/ML sensor based system for opening of sluice gates for dams along the Teesta river
- Enhance the emergency communication systems in the State integrated with Police and Forest Department

Learnings

- Encourage local know-how on building resilient structures using readily available materials e.g bamboo bridges and emergency ziplines
- Demarcation & strengthening of land falling on river reserves to avoid future risks
- Insurance coverage for all vulnerable population & properties needs to be encouraged
- Creation of central database of exchange of information on real time basis
- Strengthen the organisation structure of SSDMA in the State with inclusion of subject matter specialists

Local resident explaining the importance of Mock Drill in safe evacuation of people of Chungthang.



- Thank you