National Workshop on

UTTARAKHAND DISASTER 2013: LESSONS LEARNT

Monday, August 19, 2013

PROCEEDINGS

Organized by

National Institute of Disaster Management

(Ministry of Home Affairs, Government of India)

5B, I.P. Estate, Mahatma Gandhi Marg , New Delhi-110002

www.nidm.gov.in

BACKGROUND

Uttarakhand, one of the hill states of Northern India, was severely hit by heavy rain induced flash floods and landslides in the 3rd week of June, 2013. This abnormally high amount of rainfall has been attributed to the fusion of Westerlies with the Indian monsoonal cloud system (Fig. 3). This has resulted into huge loss to lives and properties and specially disrupting the peak seasonal activities to Char Dham Pilgrimmage. The melting of Chorabari Glacier and eruption of the Mandakini River has led to floods near Kedarnath Shrine area, Rambara, Agostyamuni, Tilwara, Guptkashi in Rudraprayag district. There were torrential rainfall in Himachal Pradesh and Western Nepal, and in other nearby regions of Delhi, Haryana, Uttar Pradesh and some parts of Tibet. Pilgrimage centres in the region, including Gangotri, Yamunotri, Kedarnath and Badrinath, are visited by thousands of devotees, especially during May to September. Over a lakh people were stuck in various regions because of damaged roads, landslides and flash flood induced debris. People in other important locations such as the Valley of Flowers, Roopkund and the Sikh Pilgrimage Centre Hemkund were stranded for days together.

Fig. 1 &2: The Kedarnath Shrine in Rudraprayag District, before and after June 2013 Flash flood

The scale and magnitude of the extreme event was such that more than 580 persons are confirmed to have lost their lives. Besides, another 5,474 persons who are still missing and presumed to be dead. The disaster was of "unprecedented magnitude". Many from political and social/religious/philanthropic organizations were also involved in the rescue and management of relief centres. The national highways and other important roads were closed to regular traffic. Helicopters and various modes of other transports were used to rescue people, but due to the rough terrain, heavy fog and rainfall, maneuvering them was a challenge. More than one lakh pilgrims, tourists and 40-50 thousand locals trapped in the terrains were rescued to safe places in the shortest possible time, notwithstanding widespread destruction of roads, difficult terrain and extremely hostile weather. In the massive response operation "Surya Hope", the IAF rescued 23,775 persons, the Army 38,750 and the ITBP 33,000 and NDRF 9,000 from the affected areas. IAF dropped 730MT of essential commodities at different places. Civil aviation helicopters airlifted 13,000 pilgrims/local people to safer places. Other state govt. agencies such as police department, district authorities, NGOs and volunteers also helped in the rescue and relief operations. The major part of the evacuation was accomplished in less than a fortnight making it one of the largest, swiftest and safest rescue/evacuation operation. On June 25, one Indian Air Force (Mi-17V5) rescue helicopters returning from Kedarnath, carrying 5 Air Force, 9 NDRF, and 6 ITBP officers crashed on a mountainous slope near Gauri Kund, killing all aboard.

Uttarakhand suffered several major disasters in the past including:

Bursting of Gohna Tal in 1894
Alaknanda Floods in 1970
Bhagirathi Floods in 1978
Uttarkashi earthquake in 1991
Malpa and Ukhimath landslides in 1998
Chamoli earthquake in 1999
Budhakedar and Phata landslide in 2001
Varunavat landslide in 2003
Munsiyari landslide in 2009
Kapkot landslide in 2010
Asiganga and Bhagirathi flashflood in 2012 and
The recent flash floods in Alaknanda, Mandakini and Bhagirathi valleys in June 2013.

It is true that the state is located in the midst of young and unstable mountains. It is also true that the area is subject to intense rainfall but neither of these characteristics observed for the last so many decades could be termed as calamity of this nature. The regular tragedies around the monsoon has been occurring in the hill state of India, which are mainly due to landslides and debris flow, but too many devastations are the result of deft attention being paid to the technology of stabilization of roads and construction of road/riverside establishments. The situation in Uttarakhand reveals not only shocking tale of vulnerable establishments but also exposed sheer nonsense of unpreparedness, be it in the form of early warning of "cloud burst" or uncontrolled development along the vulnerable terrains.

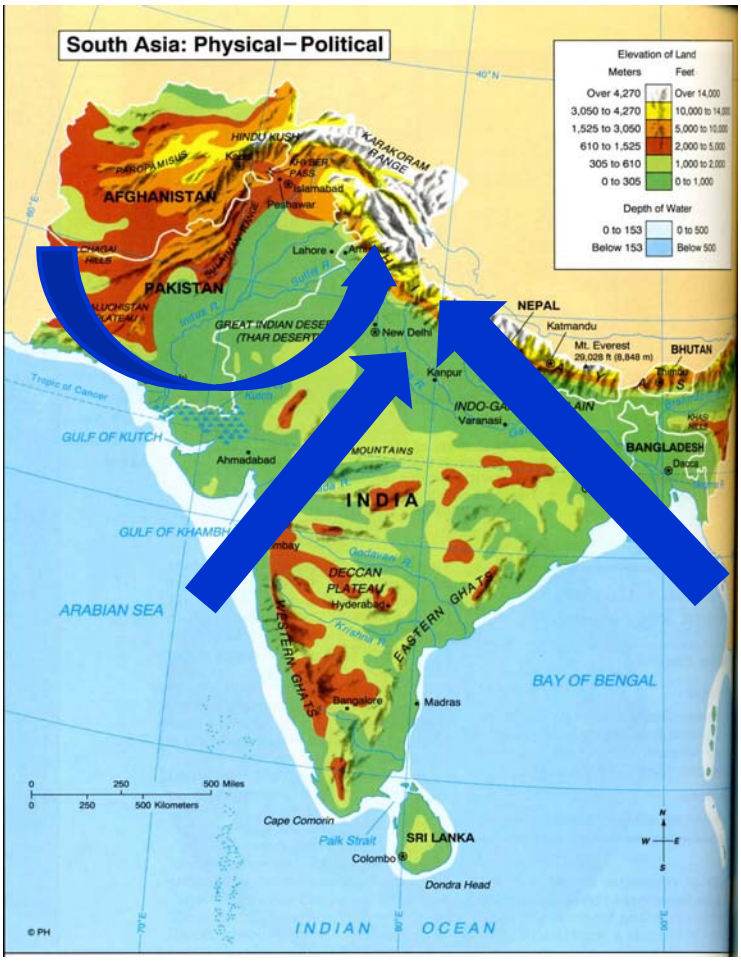


Fig. 3 Indian map showing fusion of Westerlies and monsoon clouds in June 2013

In order to share the learning experience of all the organizations involved in the rescue, relief and rehabilitation, NIDM organized one day National Workshop on "**Uttarakhand Disaster 2013: Lessons Learnt**" on Monday, August 19, 2013 at its campus.

The objectives of the workshop were:

- To share the experiences of all organisations directly and indirectly involved with the massive relief and rescue works
- To synthesize early warning related information and reasoning by various experts on the country's predicaments in "cloud burst" forecasting
- To accumulate information for the development of a national document
- To suggest strategies for short, medium and long term recovery, rehabilitation and reconstruction.

PROGRAMME

National Workshop on
UTTARAKHAND DISASTER 2013: LESSONS LEARNT
Day: Monday Date: August 19, 2013
Venue: Ground Floor Conference Hall, NIDM, IIPA Campus, New Delhi – 110 002

0900 – 1000	**Registration**		**Page No.**
1000 – 1100	**Inaugural Session**	Welcome address: Dr. Satendra, Executive Director, NIDM Address by Shri S.K. Muttoo, Chief Res Comm, Uttarakhand Address by Shri Chandi Prasad Bhatt, Padma Bhusan,Guest of Honour Inaugural Address by Shri M. Shashidhar Reddy, VC- NDMA, Chief Guest Vote of Thanks: Dr. Surya Parkash, NIDM	6 6 6 7
1100 –	**High Tea/Coffee break**		
1130 – 1400	**Session-1** **Uttarakhand Disaster Response (Rescue & Relief)**	**Chairpersons:** Shri V. K. Duggal, Member, NDMA; Shri P.P. Srivastava, Member-NEC **Rapporteur:** Ms Sreeja Nair, NIDM	**9**
	Presentations	**Keynote** Presentation on **Uttarakhand Flash Flood-2013** by Prof. Chandan Ghosh, NIDM 1. Army – Lt. Gen. N.S. Bawa and Maj Gen Sushil Agarwal 2. Air Force – AVM S. R. K. Nair 3. ITBP – Shri I. S. Negi, IG 4. NDRF – Shri S. R. Rathore, IG 5. BRO – Shri K. K. Razdan, Chief Er.	11 12 12 13 13 14
1400 –	**Lunch break**		
1445 – 1700	**Session-2** **Coordination and Admin Issues**	**Chairpersons:** Shri T. Nand Kumar, Member, NDMA; Shri Anil Sinha, VC-BSDMA **Rapporteur:** Ms Tanushree Verma, NIDM	15
	Presentations	1. Shri N.N. Pandey, ADM, Rudraprayag 2. Shri Amit Sinha, DIG, Police-HQ, Uttarakhand 3. Shri Sanjay Agarwal, Dir(DM), MHA 4. Brig. B. K. Khanna, NDMA 5. Shri Rakesh Jaiswal, Shanti Kunj, Haridwar 6. Shri Munish Kumar, CORDAID, Rep. of SPHERE 7. Dr. Surya Parkash, NIDM	16 16 17 17 18 19 19
1700 –	**Tea break**		
1715 – 1900	**Session-3** **The Way Ahead (Future Strategy)**	**Chief Guest:** Dr. Muzaffar Ahmed, Member, NDMA **Chairpersons:** Dr. P. K. Mishra, Chairman, GERC, Gujarat; Prof. V. K. Sharma, VC-Sikkim SDMA & Professor, IIPA **Rapporteur:** Shri Onkar Nath Puri, NIDM	20
	Panel discussions	**Keynote** presentation on **Future strategy and development** by Shri Chandi Prasad Bhatt, 1. Dr. Y. V. N. Krishna Murty, Director, IIRS, Dehradun 2. Dr. R. K. Bhandari, Ex-Director, CBRI, Roorkee 3. Dr. L.S. Rathore, DG-IMD and Dr.S.C. Bhan, Scientist, IMD 4. Shri Manoj Goel, Advocate, New Delhi 5. Dr. Ashoke A. Sonkusare, Dy Adviser, Planning Commission	22 23 23 23 24 24
		Concluding Remarks: Prof. Chandan Ghosh, NIDM	25
		Photo Gallery	26
		List of Speakers and Delegates	28

INAUGURAL SESSION

More than 130 participants from various government and non government organisations attended the workshop (List enclosed - Annexure-I & II). The inaugural session started with the observation of two *minutes* silence for those who lost their life.

In the welcome address, **Dr. Satendra, Executive Director, NIDM** explained the importance of documentation of the Uttarakhand Flood. He informed that NIDM team visited twice to Uttarakhand and collected valuable information based on extensive survey work in the four severely affected districts. He appealed all to provide their valuable input/feedback for inclusion in the documentation.

Shri S.K. Muttoo, Chief Resident Commissioner, Uttarakhand Government, expressed that NIDM should bring out all facts and figures with clarity for all to realize their faults and folly. He promised to extend all help to NIDM for the data collection and inter-agency coordinations.

Shri Chandi Prasad Bhatt, Padma Bhusan and noted environmentalist as Guest of Honour, started with thanks to the organizing committee by focusing on environmental safety and sustainable development. He informed all about the various drawbacks of activities against environment, which often led to the distortion and destruction of natural resources and biodiversity and ecological imbalances. He narrated various practical experiences and case studies, particularly people's movement led by him from 1960's. He put up his critical views on Uttarakhand's pre and post disaster situation mentioning ecological imbalances. He narrated various disasters occurred in 1970, 1978, 1991, 1998, 1999, 2012 and how local communities handled these disasters in the absence of central monitoring

disasters in the absence of central monitoring agencies like NDMA, DDMA, SDMA, Local, State and Central Government. In those situations, people learnt from ground realities and had worth practical exposures that state DM policy must tap with. He also narrated various issues pertaining to coordination among different organizations such as government (Local/State/Central), NGOs, international welfare organization and cooperation units such as UNDP, WHO, UNICEF, IMF, World Bank. He suggested about need of the hour for government at all the levels to step in for mutual cooperation, coordination, integration, decentralization of the responsibility and authority. He emphasized on proper documentation of all the averse and reverse situations of Indian subcontinent, Himalayan region, coastal region, including Bay of Bengal, Gulf of Kutch, and Indian Ocean. He put forward his points for data sharing, information sharing, quick response, development of integrated Early Warning System, Geo-Informatics studies, and many others like weather forecasting, wind flow chart, Oceanography etc.

Shri M. Shashidhar Reddy, Vice Chairperson, the National Disaster Management Authority, in his inaugural address as "Chief Guest", placed emphasis on the NIDM's effort for the documentation of Uttarakhand Disaster and appealed everybody to stand by the objective set forth for the daylong workshop. He stressed more on the coordination and integration of all national organizations/agencies towards reconstruction and rehabilitation of Uttarakhand.

He saluted Indian armed forces and paid homage to the departed soul and aggrieved locals. He said that disaster should also be seen as opportunity to learn from the staged reconstruction, rehabilitation, growth and development. Suffering of local people and stagnation of thousand of tourist has raised the question of basic human rights for food, water, shelter and many other essential items for the support of human life and well being. Rescue operation has to be improved so that minimal loss of life as well as non-life is ensured.

He suggested that people from hilly areas should be trained and made capable of handling eventualities and respond to disaster situation. He also emphasized on knowledge sharing and transfer of knowledge from leading professionals in disaster area. Disaster managers' experiences need to be incorporated in best practices. He cited the example of Shri Chandi Prasad Bhatt, the guest speaker of the inaugural session, and suggested to learn from his 60 years of experience on various environmental issues, disaster handling capacity, ground realities such as people involvement, scientific research etc. He commented upon the media role in handling crisis management, so that minimum rumours are spread. He expressed his desire on future strategy for better preparedness to meet disaster situation and disaster management by the community.

He briefly mentioned about his visit to disaster struck areas on 20th June, 2013 with Hon'ble Union Home Minister, Shri Sushil Kumar Shinde. On their visit to disaster hit areas, he felt the need of more bridges (permanent and temporary both). He also narrated problems of the storage and logistic facilities for food, medicines and essential commodities. He mentioned that in post disaster need assessment and reconstruction, action should also include construction of more air strips, helipads, and inclusion of more passenger carrying helicopters.

While addressing the issues and challenges of the disaster situation of the Uttarakhand, he discussed about the role of NDRF as the main force for search, rescue, relief, rehabilitation and reconstruction activity as their future mandate. He stressed on extensive study regarding policies, procedures, rules, regulations, charter of activities, action plan, best practices, accountability & responsibility etc.

TECHNICAL SESSIONS

The workshop had three main sessions

Session 1: Uttarakhand Disaster Response (Rescue& Relief)
Session 2: Coordination and Administrative Issues
Session 3: The Way Ahead (Future Strategy)

SESSION 1: Uttarakhand Disaster Response (Rescue & Relief)

Chairperson: Shri V.K. Duggal, Hon'ble Member, NDMA
Co- Chair: Shri P.P Srivastava, Member North Eastern Council, Shillong
Rapporteur: Ms. Sreeja S. Nair, NIDM

Keynote Speaker – Prof. Chandan Ghosh, NIDM
Speakers:

1. Army – Lt. Gen G.S. Bawa and Maj Gen Sushil Agarwal
2. Air Force – AVM S. R. K. Nair
3. ITBP – Shri I. S. Negi, IG
4. NDRF – Shri S. R. Rathore, IG
5. BRO – Shri K. K. Razdan, Chief Er.

The first session was chaired by **Shri V.K. Duggal, Hon'ble Member, NDMA,** who was nominated by Government of India as "Coordinator" of "Response and Relief" operation till 31st July 2013. Presently he has also been assigned as "Coordinator" of the "Reconstruction and Rehabilitation" strategy till 31st October 2013. To address the specific issues and actions by various stakeholders including state and central Government, Shri V.K Duggal, initiated a special interaction session while opening the first technical session. He mentioned that although the media covered the disaster in detail and participants onboard are aware of the happenings. There are certain bothering issues "what happened really, how we managed the rescue and relief operations, how we are going to address reconstruction and rehabilitation, long term planning and future early warning, in case of major events similar to Uttarakhand etc." The event happened on 16-17th June and there were multiple agencies involved at the ground for rescue operations by "visible and invisible agencies". Army, ITBP, NDRF, BRO, State Government and many others were involved in the post disaster rescue & search operations. Ministry of Health, Ministry of Petroleum, Ministry of Food, Corporate Sectors, NGOs, and many others played key role in rescue operation. About 4000 villages were affected, out of which about 1600 villages were badly damaged, 293 villages need to be relocated, 300 villages are yet to be connected. It is one of the largest rescue operation carried out under most difficult terrain and weather condition and lack of connectivity. About 1,60,000 people were rescued safely without any major injuries. 1,10,000 people has been shifted to safer site. He stated that disaster communities working on the ground zero were of great help, since they have expertise in dealing with crisis.

Participant from an NGO raised the question that why many other volunteer organizations were not involved in rescue operation. Shri Duggal responded to the query that more number of unskilled volunteers as helping hand would have increased the time of rescue operations, which would have added to the disasters. Besides, it becomes the responsibility of the state government to take care of logistics of the rescue workers and their safety.

Dr. Purnima Chauhan, Director of Himachal Institute of Public Administration (HIPA), Shimla asked whether simulation exercise developed by NDMA be replicated in other states or not. Shri Duggal mentioned that Govt. will soon initiate compilation of a compendium of SOPs on the response for major disasters, when there are multiple agencies involved. If Kangra 1905 earthquake happens today at night time it is estimated that about one million people may die. This was simulated in February 2013 and also simulated for Mandi district of Himachal Pradesh and other places in bordering areas of Punjab, Haryana.

Dr. R.K. Bhandari, noted Geotechnical Professional, raised question on what kind of vision government has set up at this point of time to take care of contingencies, like earthquake and earthquake induced landslides, which might even threaten Tehri Dam? What is the level of preparedness in this regard? Shri Duggal replied that there are no early warning systems available for earthquake, however, preparedness is key element. How well we are prepared to respond, rescue and relief will make a difference. SOPs for responding will be updated shortly and guidelines shall be revised. Dr. Bhandari expressed concerns regarding the bad construction practices, road cutting, etc. and how they are increasing vulnerability. He advised that there is a need for identifying the hot spots and appropriate resources must be deployed in such vulnerable areas. Giving an example of Kaliasaur landslides area, he mentioned that illegal mining and unauthorized construction in such areas must be stopped. However, Central Government cannot interfere in municipal administration which is the responsibility of state government and municipality. Central Government can only give advice regarding the vulnerability. He ended with a note that NDMA can only advice the government, it is the municipal corporations that need to take step towards developing a better structure in the area.

Key Recommendations

- Available technology needs to be used effectively
- Emphasis to be given on Simulation and early warning. Communication protocols and strategies to be revisited
- Data/information to be converted into user friendly formats for administrators and common man. Action research may be given priority
- SOPs and Plans to be put in place
- Hotspots need to be identified and interventions need to be prioritized
- Better practices (Engineering and Land-use) while redeveloping
- Fragile environmental sensitivity of the ecosystem to be kept in mind while developing
- NDRF to be strengthened with more human and material resources. SDRF to be set up and made functioning

KEYNOTE PRESENTATION

Prof. Chandan Ghosh, NIDM brought out few interventions mainly related to lacuna in early warning/ monitoring, information sharing, etc. and what went wrong and what can be learned from this. Mountains are fragile and every year new roads and infrastructures are developing and they are getting damaged. It is the time to relook into the existing design/maintenance approaches which may have become obsolete. It is more important to give emphasis on effectively using the systems instead of spending crores in procuring and deploying new systems. We need to relook or analyse the existing systems in place and understand how to use them timely and effectively to save lives and reduce sufferings of people, damage to property and environment. He has given a comparison of Weather Forecasting system in the form few apparently implausible images and bar chart and pristine protocol still being followed in the country, which has hardly any reach to the administrator in "palatable' form. He also gave the stark comparison between capabilities of Google (Digital Globe), which is freely available with more prominent indications and Bhuvan images that still needs temperamental outlook. Prof. Ghosh informed that although India is known for eminent scientific agencies like IIRS, CBRI, WIHG, our neighboring country Bhutan takes pride in the deployment of GLOF warning system. While describing pictorial information on vulnerable conditions along the "Rambara to Kedarnath" tract, Guptkashi, Srinagar, Prof. Ghosh remarked that "faith" is supreme not "safety" and no one us possibly ready change the mindset.

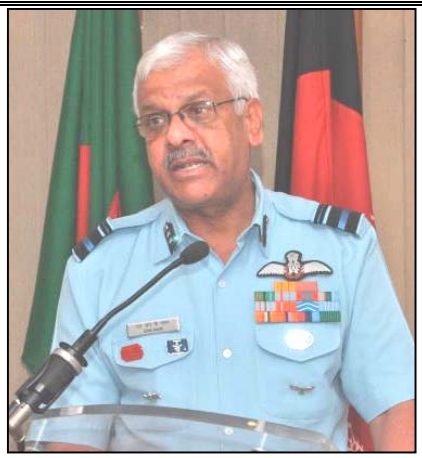
NIDM is mandated to do documentation of disasters, which it has started from 2011 onwards and unfortunately as of now most of the data is taken from Google/Wikipedia/CRED or web. According to Prof. Ghosh, information is not available to general public and archived data is not available freely in the national weather services website. He emphasized that data/information/warnings produced by these agencies need to be customized to the level of administrators and common man, who are living in the hazardous area. Else, "heavy rainfall warning" like message of 14th June 2013 by IMD would go again into deaf ears. CWC is yet to develop and implement such systems for major part of the country, specially areas where flash flood are frequent. Virtual simulations of flood scenarios are developed in other countries like Japan, but we are yet to advance in these areas. Landslides are primarily happening due to human interventions. Effective warning systems involving community and bio-engineering measures need to be opted. He has cited several examples of civil engineering and bioengineering solutions from other countries, including some good and bad practices etc. from Indian state of Assam and Sikkim. Better solution using wide variety of geosynthetics, soil nailing are available and it is the time to go for them suiting site conditions. Disaster gives wakeup call and it is the time to act accordingly.

Lt Gen N.S. Bawa, Indian Army mentioned about the challenges faced by the Army to win over the nature since "It was a war, race against time and aggression against nature". He mentioned that about 33,000 sq.km area was affected. Every year the Indian army carries out

operational discussions in the month of May and also do the stocking for monsoon and winter, which can be considered to be the part of best practices followed by the Indian Army. He said that the delay for army to handle the affected people was because of the lack of non availability of unit in Kedarnath or nearby area. He mentioned that due to bad weather forecast, the rescue operation had to be carried out in a short span of four days. He further mentioned that high level officers were deputed in the field. The motto of operation was to physiologically making people strong, sustain life, fast evacuation, with priorities for critical areas. Rescued victims were made to shift into the relief camps and to provide medication to the victims. The army created a helicopter bridge and temporary helipads in the area and almost thousands of people were rescued. The availability of ration was for about 2-3 days only, thus making situation worse. He summarized by saying that Army will always be the first to respond in calamites.

Maj Gen Sushil Agarwal, Indian Army, stressed upon the three phases of rescue operation. These are rescue, evacuation by air and evacuation by foot. He told the audience that Army had prioritized the rescue work in an order that sick and wounded were taken out first, old were the second lot that was rescued, third priority was of rescuing the women and children and last one was for the remaining young and healthy persons in the area. He mentioned that senior level officers were deputed on ground to help the command and control setup in the area. They were given the responsibility to setup helipads, satellite phones, to fly medical team in the area, etc. He has given the advice that there is a need to setup the early warning system, which is comprehensive, can be responsible for mass dissemination of the information, etc. He also stated that there is a need of changing the careless attitude of people and is important to be more responsible towards environment and having a positive mindset. He advised there shall be a proactive response to the disasters. Stressing upon early warning specified drills and pre positioning of the damage assessment, he mentioned that the proper dissemination of proper information is necessary. He advised that the media may be used for the purpose of helping in the rescue operation. He mentioned that there is a need to curb the tourist visits in such highly vulnerable place and protocol of visits must be taken care, right from the beginning.

AVM S.R.K. Nair, Indian Air Force, spoke about Indian Air-force response towards the disaster. He told the audience about the helicopters used by the Indian Air-force in the rescue operations. MI- 26, MLH, ALH and Cheetah were used during the rescue operations in the Uttarakhand disaster 2013. There were 13 fixed winged aircrafts that were used for the rescue. Since Jolly Grant airport was saturated, the major task in front of Air Force was to find another place where they can create a temporary base for the purpose of landing aircrafts and evacuating people. Dharasu and Gauchar were the two bases where most of the evacuation was done. They



also created a base in Joshimath and Guptkashi, but these were secondary bases. He mentioned that Indian Air Force started its operation with 17 helicopters on 19th of June 2013, on 22nd June 2013 the number was increased to 45 helicopters. This operation was named as **Operation Rahat** and was the biggest rescue operation IAF ever carried out. The C-130 J "Super Hercules" was used for the first time for the purpose of fuel bridging at Dharasu air base, later MI-26 was used to air lift the fuel from Dharasu. Almost 150 passengers were being evacuated every day. By 23rd June, 3796 passengers were evacuated, and 23,000 people have been evacuated till date. He also mentioned that almost 4-5 helicopters of Air-Force are still in the area for the purpose of rehabilitation.

Shri I.S. Negi, I.G, ITBP elaborated about the initial warning by IMD and how ITBP responded to the same. Received weather alerts from IMD on 15.06.13 followed by directions issued to SHQ & units under command and invoked state of alert. All units and RRCs directed to be in readiness for disaster response. State coordination meeting chaired by Hon'ble Chief Minister, Uttarakhand was held on 17.06.2013 where ITBP modalities and course of action were also deliberated. All ITBP institutions in Uttarakhand brought under operational control of IG N Ftr. ITBP was actively involved in all the operations viz. evacuation by land, assisted Air force in evacuation by Air, medical treatment, food and shelter, construction of temporary roads and bridges and repair works and several other activities. Shri Negi told that since ITBP has skilled troops comprised for 1600 ITBP persons were put into task that have immense knowledge about the hilly terrain and it is favorable for them to take up rescue operations in such terrain. The rescue operation in the state of Uttarakhand was not easy but with the trained force they were successful in rescuing the stranded people. ITBP has its regional resource centers, which were helpful in this situation. He said that 32,000 people were rescued by the ITBP force.

Shri S.R Rathore I.G., NDRF, told the audience about the difficulties faced by the NDRF in the rescue operations and in this regard he gave his valuable suggestions. Four teams from 09 Bn Bhatinda and eight teams of 08

Bn Ghaziabad were deployed for rescue operations in Uttarakhand. He said that special vehicle force working in the rescue operations must be provided. Equipments such as cutters, floating rope, water purifiers and the basic necessary things must be provided to the troops so that it becomes easy for them to cope up with disastrous situation as soon as possible. The lack of communication was another major issue he pointed out.

Shri K.K Razdan, Chief Engineer, BRO shared that the toe erosion is more devastating than landslides. He stated that roads and settlements along rivers are highly vulnerable and hence should be avoided. Adding to this he said, the reclamation

of river must not be done at any cost, this is just an invitation to the disaster. He suggested that reservoir area of HYDEL projects must be protected and also added that the roads must be aligned. Planning the city is most important task right now. Capacity building is a must and also there is a need of creating and following traffic regulations in the state that is very vulnerable to disasters. He further added that early warning system must be developed that can be helpful in informing the people about the bad weather and accordingly evacuation can be done on time. Adding to his statement of alignment of roads, he said, there shall be alternate routes as well and pre planning of such routes must be done in order to escape chaos in future. He also stated that it is important for the habitants living along the river side to be aware of the vulnerability of the area.

TECHNICAL SESSION 2: Coordination and Administrative issues

Chairperson: Shri T. Nand Kumar, Hon'ble Member, NDMA
Co-chair: Shri Anil Sinha, Hon'ble Vice Chairperson, BSDMA
Rapporteur: Ms.Tanushree Verma, NIDM.

Speakers:
1. Shri N. N. Pandey, ADM, Rudraprayag
2. Shri Amit Sinha, DIG, Police-HQ, Uttarakhand
3. Shri Sanjay Agarwal, Dir (DM), MHA
4. Brig B. K. Khanna, Sr. Consultant, NDMA
5. Shri Rakesh Jaiswal, Shanti Kunj, Haridwar
6. Shri Munish Kumar, CORDAID, Rep. of SPHERE
7. Dr Surya Parkash, NIDM

Objective of the session: Analysis of role performed by various line departments of Government of Uttarakhand including Disaster Management and Mitigation Center-Uttarakhand, Police Headquarter- Uttarakhand and Inter Agency Group (IAG) and other voluntary organization.

Chairperson briefed about the issues of coordination among various departments during the Uttarakhand disaster and role of unified command system in disaster management. It was appreciated by Chairperson that State Administration, Army, NDRF worked very effectively in relief and rescue work and it was one of the largest rescue operation done ever by the Government of India.

He mentioned that duplication of relief services could be avoided with establishment of effective State Emergency Operation Center with predefined Standing Operating Procedures (SOPs) for all the departments under State Disaster Management Authority through State Disaster Management Plan.

The Keynote presentation on "Uttarakhand DM administration" by **Dr. Piyoosh Rautela, Executive Director,** Disaster Mitigation and Management Centre, Dehradun, could not be held due to his preoccupation at Dehradun.

Presentations:

Shri Nav Neet Pandey, ADM, Rudra Prayag district discussed about following issues-

- Immediate/Short term perspective- search and rescue/relief, Long term perspective- reconstruction and rehabilitation.
- The encroachment near and around Kedarnath Temple in the valley and this issue has been discussed with the main priest of Kedarnath last year and issue is pending at high court to look into the matter.
- During search and rescue operations, effective coordination happened at different level like: Intra State Departmental Coordination, Inter State Coordination, Coordination with Armed Forces/ Para military/NDRF, Coordination with the Media etc.

Following observations and suggestions were made by him:

- Centrality of control & command should remain with District Magistrate to avoid any multiplicity of relief services in a particular area.
- Guidelines for missing people may be developed by the National Disaster Management Authority (NDMA) for settlement of claims by victims and their family.
- Disaster Management plan should also provide/identify safe locations for disposal of the muck and debris.
- Promoting existing technique of communication system for dissemination of information before and during the disaster.
- Relief material being supplied from other States or Voluntary organisation should be packed in small water proof packets for easy distribution.
- Media briefing should be done from one pre-identified media management centre as per the Disaster Management Plan so as to avoid confusion and rumours among masses and administration during relief and rescue work.
- One of the important challenges is ensuring the alternate livelihood issue of Women headed household, who lost male members of the family.
- Relocating people completely from vulnerable to safer places.

Shri Amit Sinha, DIG, Garhwal Region, Uttarakhand, mentioned about the role played by Police Headquarters in search rescue and relief during the disaster. Following suggestions were made by him:

- He discussed about need of one uniform command system for coordination and better management of such disaster.
- In hilly areas, Plan for mule managements is also required to be developed.

- Plan for the disposal of dead bodies should be developed in advance.
- Cremation in such a high altitude with continuous rain and low oxygen was very difficult, for this some alternative is to be looked into.
- The more number of helipads may be developed in hilly areas for rapid search and rescue.

Shri Sanjay Agarwal, Director (Disaster Management), Ministry of Home Affairs, Govt. of India, discussed about the mitigation and preparedness measures of Uttarakhand disaster by which loss of life could be minimized. He emphasized upon the participation of community at every stage, so that community who is first and last responder to any disaster can work effectively. The main suggestions include:

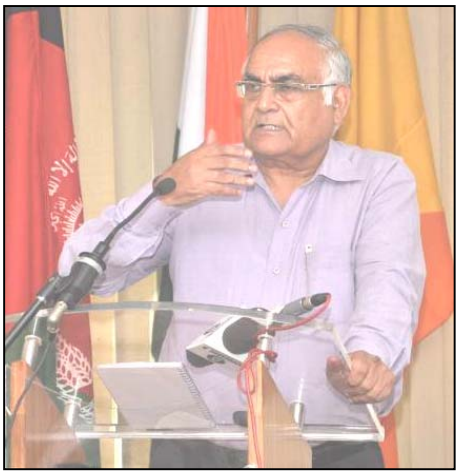
- Ensuring Participation of local people in Disaster Management activities at state, district and community level & sensitizing communities, schools & institutions preparing them to respond to any disaster effectively and efficiently.
- Prepare Community based Disaster Management Plans in coordination with District Administration. Same may also be done for all the villages and Panchayats.
- Providing training in First-Aid and Search & Rescue techniques to the Communities.
- Well-coordinated institutional setup and effective Emergency Response Planning are important for efficient response during disasters.
- During response coordination among various agencies to perform functions related to Law and Order, Evacuation, First-Aid and Trauma counseling, Search & Rescue, Relief Distribution and Media Management are required.

In view of preparedness and mitigation activities following recommendations were made:

- Expeditious preparation of a comprehensive state disaster management plan considering the fragile ecological system of the Himalayan region
- To consider methods for regulation of pilgrims with mandatory registration, identification and movement to avoid rush at a particular vulnerable and critical site
- To examine mandatory insurance of pilgrims.
- To set up/strengthen the state disaster response force for timely search and rescue.
- To consider movement of vehicles in convoys with SDRF in pilot vehicle with communication devices.

Brig. B. K. Khanna, Sr. Consultant, NDMA recommended that more number of drills are required to be conducted by the State Government as NDMA and the Government of Himachal Pradesh has done for Mandi. He mentioned further that Himachal Pradesh is going to activate the Standing Operating Procedures of various departments under District and State level authority of Disaster Management.

He further mentioned that voluntary organizations played vital roles during the relief and rescue work but that need to be coordinated by Unified Commanders at District level under each District Disaster Management Authority so that a long term strategy for responding during disaster may be developed for voluntary organization.



He pointed out that a control room was set up at State level for receiving and dissemination of information to various role players, however, a State level Emergency Operation Center with representative from all the departments and Emergency Support Functions were not established to avoid mismanagement of services. At District level none of the District had its District Disaster Management Authority in place.

Shri Rakesh Jaiswal, All World Gayatri Pariwar, Shanti Kunj, Haridwar discussed the effort of Gayatri Pariwar in supporting the relief work of the Government of Uttarakhand from the day one, specially in ensuring safety of pilgrims and people living in hills. His organisation, with great network of dedicated volunteers supported victims in reducing stresses & tension and to prepare them to face difficult situations by inculcating awareness and fellow feeling. He mentioned that geographical condition was one of the reasons of the disaster. However, lack of knowledge of pilgrims, ignorance, avoidance of safety rules, heavy rainfall and uncontrolled masses were the main reason is behind the havoc. He further discussed about the impact of this disaster in term of losses of unaccountable lives and damages of infrastructure include roads & buildings, which paralyzed the Uttarakhand administration.

He gave the details of relief work done by the Gayatri Parivar:

- Started immediate relief work on 17.6.13 by the call of Uttarakhand Govt. and Local Administration.
- Global Headquarter of Gayatri Pariwar, Shantikunj converted into base camp of Uttarakhand Relief Work.
- Started sending food packets by government helicopter for affected area.
- Till 26.6.13, one lakh food packets were distributed
- Shantikunj Management organized seven Response Groups for Uttarkashi, Rudraprayag, Tehri, Chamoli, Pithauragarh, Haridwar and Dehradun districts and made a central team to execute needful activities of Relief Work.
- After the road clearance, teams of Shantikunj were moved with medical assistance and general item (home kit, Ration kit, blankets, Tarpaulin etc.) for affected area of above districts.

- 1500 Volunteers of Gayatri Pariwar are deployed for Relief work, 45 Vehicles were being used for Relief work.

He mentioned about the immediate short term relief i.e. food packets, medical aid, ration kit, blankets, tarpaulin, cattle feed, clothes, utensils etc and long term recovery and reconstruction work for making shelters, schools and Community Center where voluntary organization supported State Administration. He mentioned that voluntary organization played a vital role in Disaster Management and Gayatri Parivar Organization coordinated the response team during the disaster. At the end of his presentation, a complied video was shown to the participants, giving full view of the operation centre at Shantikunj, management pracices followed in packaging, distribution of items to designated place where relief camp are established, communication with volunteer using high speed mobile and GPS network, etc.

Shri Munish Kumar, Country Adviser, CORDAID (Rep of SPHERE India), in his presentation, briefly introduced the SPHERE India's vision and purpose of SPHERE for coordination of National Coalition of Humanitarian Agencies in India. He explained the role of Sphere India was to facilitate Inter Agency Coordination, Training and Capacity Building, Collaborative Advocacy and Information, Knowledge and Learning Management through a collaborative process for Quality & Accountability.

He broadly differentiated the coordination in the following ways: Coordination - among NGOs/International NGOs in updating the status on day to day basis to NDMA, availability and allocation of resources and responding to different issues like -Food/Shelter/Livelihood/WASH/Education/Vulnerable groups, supporting in conducting assessment by UNDM Team and Common Planning/strategy for long term rehabilitation- with Line departments. He further discussed about Coordination- among agencies: NGOs, IAG, UN, State Government, District/Local Administration. He appreciated the efforts made by the Armed Forces, NDMA, MHA, Private sector, other stakeholders (Rotary Club/Patanjali).

Dr. Surya Prakash, NIDM, New Delhi initiated his presentation with a Czechoslovakian proverb stating that "*Misfortunes Enter When Window is Left Open to Them"* and Chinese proverb stating that " *When heaven sends down calamities there is a hope of weathering them, but when man brings them upon himself there is no hope of escape"*.

He highlighted the role of human intervention in devastation during flash floods in Uttarakhand. He also mentioned that the Uttarakhand state had experienced numerous disasters in the past as well. However, he expressed that we are not serious in learning lessons from such catastrophic events and the disaster management practices have not shown any remarkable

improvements. He stated that NIDM has done detailed field study and interactive surveys (with more than 1000 stakeholders) which have indicated that poor coordination, lack of implementable Disaster Management plans, paucity of trained dedicated and equipped human resources and poor community empowerment as some of the factors were responsible for the slow/poor disaster management.

Dr Parkash mentioned that "Hazards are Natural but Devastation are due to Human Actions" He opined that disaster are mainly due to:

- Failure of Early Warning System
- Lack of Disaster Management Action Plan at different levels
- Indiscriminate development in the hill towns including unscientific road/building construction, ill-planned infrastructure facilities and utility services
- Illegal encroachment taking place along the rivers
- Adverse human activities like deforestation, mining, quarrying, blasting, drainage disruption, slope modification etc.
- Priority for commercial /tourism/infrastructural development concerns over the environmental impact

At the end of his presentation he suggested five steps for effective disaster management which included-

- Clearly defined roles and responsibilities.
- Transparency and accountability.
- Developing and assessing capabilities.
- Effective coordination and collaboration among relevant stakeholders.
- Periodic evaluation of and reporting on these coordinated efforts.

Concluding Remarks by Chairpersons:

a. Disaster Management and Mitigation Centre, Uttrakhand should update its website regularly on the requirement of various relief material indicating different localities so that duplication /overflow of relief material in a particular area may be avoided.
b. All the State may activate its State Disaster Management Authorities and District Disaster Management Authorities in view of the Disaster Management Act 2005 for clarity of Incident Command System and role of various

departments at district level during any disaster. NDMA may play an important role in setting up and activating Disaster Management Authorities at various levels.

c. It was indicated by Shri Anil Sinha that status of awareness generation among masses was very poor. Massive Awareness Generation activities are required to be conducted at all levels. Public awareness and education is mandatory in preparedness and mitigation. We should reach out to every family, each person as family is the first responder.

d. It was impressed by the chairperson that disaster management is a team work and mutual appreciation improves coordination among various departments. According to High Power Committee report on Disaster Management each organization/department has two different role – core responsibility and supportive role. There should be clarity and understanding of roles to avoid mismanagement and duplications.

e. He suggested to promote protocol for "family kit" for better management of relief materials. He encouraged the importance to popularize and disseminate the knowledge of management of relief material done by Shantikunj team and other voluntary organizations to set the example for best practice.

Session 3: Future Strategy: The Way Ahead

Chief Guest: Dr. Muzaffar Ahmed, Hon'ble Member, NDMA
Chairperson: Dr. P.K. Mishra, GERC, Gujarat
Co-Chair: Prof. V.K.Sharma, VC- Sikkim SDMA & Professor, IIPA

Rapporteur: Mr. Onkar Nath Puri, NIDM

Keynote speaker: Shri Chandi Prasad Bhatt, Padma Bhusan

Speakers:
1. Dr. Y. V. N. Krishna Murty, Director, IIRS, Dehradun
2. Dr. R. K. Bhandari, Ex-Director, CBRI, Roorkee
3. Dr. L. S. Rathore, DG-IMD and Dr. S.C. Bhan, Scientist, IMD
4. Shri Manoj Goel, Advocate, Supreme Court, New Delhi
5. Dr. Ashok A. Sonkusare , Dy. Adviser (S&T), Planning Commission

The Session began with the introductory remarks by **Dr. P.K. Mishra**, **Chairman, GERC, Gujarat**, who gave an overview of reconstruction activity. He emphasized on the "***Looking Forward***" approach of disaster management for the shelter, livelihood & involvement of people & NGO's, etc. He emphasized the need for developing user friendly policies so as to attract the common man at grass root level. He also spoke about the different methods of reconstruction of the affected area. His main focus was on comprehensive and broad program on the long term aspects of disaster management such as reconstruction, capacity building & rehabilitation (physical & social).

Shri Chandi Prasad Bhatt, Padma Bhusan in his **keynote address** discussed about the Himalayan environment & development from disaster point of view. He shared his past experiences about the CHIPKO movement and its impact on improvement of the green environment. He shared some details regarding "Best Practices" adopted by district & local officials for disaster management. He talked about the impact of glacier down gradation, sand erosion near the beds of rivers like Alaknanda, Brahmaputra and many others. He emphasized on the People's Approach & judgment instead of aggression.

Dr. Y.V.N. Krishna Murty, Director, IIRS, Dehradun mentioned about the use of technology in the Himalayan region's disaster management. He emphasized on the transfer of technology through capacity building and to ensure efficient utilization of Natural Resource Survey, Earth and Atmospheric Sciences and Oceanography. He discussed about the IIRS-ISRO response to Uttarakhand Disaster, and briefed that the detailed satellite maps were made available for relocation to safe sites. He also highlighted about the ongoing activity by IIRS regarding the landslides risk assessment**.** Thereafter, he put forward about the capacity building efforts by the ISRO-IIRS by offering National (Degree & Diploma Courses) & International Courses in collaboration with University of Twente, The Netherlands.

Dr. R.K. Bhandari , noted **Geo-professional,** had 25 points to discuss**,** which he broadly classified them into 5 groups. Firstly, he pointed out that the simplest way will be to solve the known problems, by putting proper responsibility, direction & accountability. Secondly, risk is to be mapped through reliable source of maps & vulnerability studies. Thirdly, make it user friendly by setting some example of Early Warning System & Data directed towards them. Fourthly, all documentation needs to be done for all hazard profile & data interpreted in the form so that a reliable database will be generated for the stakeholders. In the last, he emphasized on the immediate plan of action for disaster management activities.

On behalf of Dr L.S. Rathore, Director General, India Meteorological Department, **Dr. S. C. Bhan, Scientist,** in his brief presentation, discussed about various technologies being used such as weather forecasting, climatology, rainfall, extremes of precipitation, etc. He explained about the landslide hazards maps & highlighted that the state of Uttarakhand lies in high hazard zone. He discussed the case study on Uttarakhand, where he pointed out that it was not a cloud burst but rather it was the result of heavy rainfall. He also explained about various factors responsible for lake burst and increase in the state of vulnerability, which led to June 2013 disaster. In the end, he provided insight about the functioning of IMD & various prospective modernization programs undertaken by IMD such as Integrated Himalayan Meteorology Programme. He also discussed about the future strategy of the Proposed Network for Western Himalayas and coordination between IMD and state/central level authorities in terms of communication, understanding & suggestive action plan**.**

Shri Manoj Goel, Advocate, Supreme Court of India New Delhi put forward his view regarding the legal issues to make Disaster Management system more effective. He specifically mentioned about the Central Government Act Article 21 in the Constitution of India 1949, which is related to the protection of life and personal liberty. He strongly advocated that Disaster Management should be part of the Constitution, so that it can be enforced at National Level as Constitutional Duty. To make his argument stronger, he put forward some relevant case studies, which has improved the legal system. He pointed out that everyone should come together & try to overcome the issues of implementation of law.

Dr. Ashok A. Sonkusare, Dy. Adviser (S&T), Planning Commission, New Delhi: briefly introduced the concept of disaster management, in which he focused on the following points:

- Identify the vulnerable regions in the hilly areas,
- Study the complete ecosystem of these regions by mapping its biodiversity, glaciers, forests, wild life and cultural landscape,
- Collect the satellite/ground truth data, modeling exercise for identifying the hot spots and gap areas in the concerned region**,**
- Develop early warning systems for real time monitoring the landslides.

The real time monitoring should include continuous monitoring, transmission of data through telemetric system at regular intervals, alarm signals to be made available to the stakeholders, generate awareness among local communities about early warning system with local participation. He also briefed about the Government Action plan for the Himalayan Region such as Inter Governmental Panel on Climate Change (IPCC), National Action Plan on Climate Change (NAPCC) and eight National Missions such as: National Solar Mission, National Wind Energy Mission, The Energy Efficiency Mission, Sustainable Habitat Mission, Sustainable Agriculture Mission, Mission on Sustainable Himalayan Eco-systems (NMSHE), National Mission on Strategic Knowledge for Climate Change (NMSKCC), and National Mission for a Green India.

In the end, he highlighted the main objective of these missions such as networking of knowledge institutions, training of glaciologists, setting up of new centers and strengthening of existing units, ecosystems monitoring, climate change adaptation and public awareness programmes, support to government for sustaining the Himalayan Ecosystem initiatives, etc.

Dr. Muzaffar Ahmed, Member, NDMA concluded the session by summing up critical points which were raised in the session. He added few key research areas, such as scientific ways and means of approach to the disaster management, crisis management, crowd management,

situational expertise, emergency support system, first responder approach, development of local community, and improving psycho & social support to the aggrieved people. He also mentioned about past lessons and to learn from them that scientific and systematic development policies and procedures need to be followed at all levels of government as well as local communities such as Panchayati Raj Institutions for the construction and reconstruction of roads, dams, schools, colleges, hospitals, buildings by adhering to building by laws and environmental safety respectively. He focused on integration and strengthening of early warning system for better resilient and capacity building.

Prof. V.K. Sharma summed up the Session-3 by making this as beginning of new era in the history of Disaster Management. He shared his experience about disaster management skills being followed in Sikkim after the state faced an M6.9 earthquake in 2011. He discussed about positive signals from all the bureaucratic setup as well as from government mechanism. In the end, he pointed out that academician/researchers should not be ignored as they play important role in studying the current & crisis situation of the region. Definite action should be taken or else this situation will become another example of fire fighting exercise only.

The workshop concluded with vote of thanks and with the following concluding remarks by **Prof. Chandan Ghosh, NIDM.**

Method of debris removal efficiently by some JCB, Bulldozers and cutting fresh mountain clip for road widening or new avenues along fragile mountain range with little or no knowledge of site geology/geotechnology…have proved so far unethical, unscientific and devoid of technical acumen of the country…. thus leading to costly maintenance/fire-fighting exercise in the hilly areas…this practice has to be tailor made into more sustainable techniques already available in the country

It is required to gather momentum on how to bring together the community, government and scientific mindset to effectively plan forecasting/prediction and preparedness actions for the reconstruction of Uttarakhand.

There are lots more to try out but it's time to work for Uttarakhand's resurgence. And for that I am sure iconoclastic comments on our past failure or predicaments may not show much light to the betterment of our future outlook so easily. It's time to work together with synergistic attitude. We have to ensure the attitudinal changes in our resort to bring positive outlook within ourselves first. And disaster of this magnitude is one such spirit that must help redeveloping our future better. ...Jai Hind!

Receiving Chief Guest & Guest Speakers by Executive Director, NIDM

Observing 2 minutes silence before the inaugural session

Inaugural session, address by Shri SK Mattoo, Chief Res Commissioner, Uttarakhand Govt. and inaugural address by Shri M. Shashidhar Reddy, Vice Chairman, NDMA as Chief Guest

Participants in the technical session

Discussions during the technical sessions

Annexure -I: List of Speakers

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