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Disaster Governance in India

Series-1

Centre for Disaster Management
Lal Bahadur Shastri National Academy of Administration, Mussoorie

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Disaster Governance in India- Series 1

PREFACE

Disaster Management, Emergency Response, Crisis Management or damage control requires expertise, quick decision-making and spontaneous action. Disasters like earthquakes, floods, cyclones, tsunami, landslide, cloudburst and other natural calamities as well as man-made disasters have increased both in frequency and fury. Due to repeated natural and man-madedisasters, India has suffered enormous loss in terms of lives, livelihoods and damage to both public and private properties. To minimize the loss due to disasters of various kinds, efficient and effective response and quick decision-making is the key requirement for disaster managers.

Disaster management is one of the major activity undertake by district administration. By virtue of the Disaster Management Act 2005 District Magistrate / Divisional Commissioner is the ex-officio member of the District Disaster Management Authority (DDMA). As head of the district, the District Magistrate is responsible for crisis management during natural and manmade disasters and also fully involved in the post disaster relief & rehabilitation efforts.

National Disaster Management Authority (NDMA), INDIA has entrusted the Center for Disaster Management, LBSNAA,the responsibility for capacity building of IAS and Central Services officers on Disaster Management. As part of the project "Capacity Building for IAS and Central Services Officer on Disaster Management" this book has been compiled and published to provide first hand knowledge for better understanding about disaster governance in various districts in India for future IAS and other Central Services Officers. The book will be useful to the ATIs, CTIs for their various in-house courses as a good reference material.

This book "Disaster Governance in India – Series – 1" will portray the emergency management and disaster governance issues existing in the districts of India. The book will also provide perspectives of IAS officers posted across India during their district training. This edited volume has been evolved from the selected district assignments on Disaster Management submitted by the IAS Probationers of 2010 and 2011 batch.

I extend my gratitude to the National Disaster Management Authority for their support and encouragement to CDM, LBSNAA in the field of disaster management.

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CONTENTS

Chapter 1

Disaster Management at Dhemaji District, Assam

Ashwani Kumar, IAS

The District of Dhemaji is a perennially flood affected district. The region falls within the highest seismic belt and experienced two major earthquakes, one in 1897 and another in 1950. The great Earthquake of 1950 changed the topography of the District and also changed the course of the principal tributaries like Moridhol, Jiadhal, Subansiri and Gainadi. The main objective of the plan is-

- To rescue and evacuate trapped people
- To provide first aid to the injured
- To take care of children, women and disabled persons.
- To transfer the seriously injured and people need urgent medical attention to hospitals
- To provide shelter and relief to the homeless
- To restore communication and essential services
- To take urgent measures for maintaining law and order
- To take measures for disposal of the dead bodies and animal carcass to prevent outbreak of any epidemics
- To take people to safer places in case of change of course by the rivers.

EARLY WARNING SYSTEM

The Control Room has been set up at the disaster Management office. The chief executive officer, DDMA is the overall in charge of the functioning of the control Room. Similarly 2 staffs function under the circle officers are placed at the revenue circles for disseminating any warning or impending disaster. The Flood Early Warning received from NESAC turned out to be accurate during the last monsoon expected 7th July. The information received on 13th August through SMS and 10th September through email was correct in respect of the last two Flash Flood which occurred at Samarajan and Jonai Sub-division. After receiving the alert messages from NESAC, the District Administration got ready to face any challenges .The people residing near dykes and other low lying areas were informed immediately as they are more vulnerable. During the 13th August Flood at Samarajanarea , alert message was given beforehand by NESAC through SMS. It helped the Administration to prepare in advance .The case was also

similar for flash flood at Jonai Sub-division on 10th September. Alert message was given by NESAC through email for Bordoloni Block, but it occurred at Jonai. After receiving the Early warning the people residing near Brahmaputra and Simen rivers were immediately alerted by the Authority. The Deputy Commissioner himself rushed to the worst affected spot at Berachapori and inspected the rescue operation by the volunteers of Disaster Management. Though the areas were wrongly predicted but it helped the Administration to get prepared. Suggestions-Workshop regarding Early warning system should be conducted at regular intervals at the grass root level. Strengthening of the existing District Emergency operation centres with more sophisticated equipments for dissemination of Early warning to the grassroot level. Concerned line Departments officials must be trained regarding FLEWS mechanism Setting up of Early warning stations at upper catchments areas for quick flow of Information.

CONTINGENCY PLAN

For better and prompt delivery of services, the District has been divided into 4 zones in order to meet the challenges at the time of Flood, headed by a Zonal officer as overall in charge. The zonal officer is assisted by the Sector officers/Assistants/Volunteers. The Zonal Officer will be responsible for transmitting and updating the daily situation report to the District headquarter. Gogamukh Revenue Circle is annually affected by flood erosion and storms of which flood is more devastating.The total area of the circle is 231.46 Sq Km surrounded by Arunachal Pradesh in north, Dhakhuakhana subdivision in south ,Kumatia and Dhemaji circle in the east and Subhansiri river &Lakhimpur district in the west with a population of 1,12,786 (as per census 2011).The total no of revenue villages are 174 with 1 Police station. The rivers and tributaries under the circle are Kumatia, Na-nadi,Subansiri, Chengalisuti Cheniajan and Tarajan. The tributaries of Na-nadi flow out of Arunachal Pradesh through Subhansiri reserve forest towards Gogamukh circle creating a network of rivers, which during rainy season swell up and creating flood. On the eastern part of the circle at the western bank of Kumatia river there is likelihood of flood to atleast 20-25 villages due to breach in the embankment.In the year 2009-10 , 57 nos of villages were affected with a population of 21,306. Considering the severeness of the problem the Gogamukh revenue circle has been divided into 4 zones.

Zone –I: The northeast area of the Gogamukh revenue circle falls within this zone and 30 no of villages have been identified within this zone. This zone is moderately affected by flood. .Sri Homen Handique Lot Mondel (LM), will be in charge of this zone and will be assisted by Sri Anil Sonowal, LM , Lohit jyoti Das, Hari Das, LM and all Gaon Burhas of the identified villages.

Zone-II: The villages of the eastern part of the Gogamukh revenue circle falls within this zone and 32 nos of villages have identified within this zone.as highly flood prone. Sri Nandesar Dutta ,SK and Prema Saikia (9435534506) are in charge of this zone and they will be assisted by ,Lila sut, Monjil Bora ,Rajiv Goswami and Juganta Bora (all LM).

Zone-III: The southeastern areas of Gogamukh revenue circle falls in this zone and 30 no of villages have been identified under this zone.. Sri Debiram Chunkrang SK, will be in charge of this zone and will be assisted by Sanjiv Bora, Bhagirat Kalita and Pranab Roy.

Zone-IV: The western part of the Gogamukh Revenue Circle area which is least affected by floods falls within this zone and 70 no of villages have been identified. Debiram Sungkrang SK is the in-charge of this zone and will be assisted By Pranab Roy LM, Achyut Handique LM, Bulan Saikia SM. Dhemaji revenue circle is prone to flood and due to its topography and geographical location numerous tributaries flow out of Arunachal Pradesh towards Dhemaji, forms an intricate network of rivers. The entire circle is in riverine tract and flood may last from weeks to month. Siltation is another major problem causing great damage to cultivation. The western part of the revenue circle is more flood prone to the river Jiadhol. In the last flood 165 nos of villages were affected with a population of 53,661.The total population of the revenue circle is 1,68,862 (as per census 2011) with area of 3,68,963 B-1 K -2 L or 49,392.666 hectares. It is surrounded by Arunachal Pradesh and Jonai Subdivision in the north, Dhekuakhana revenue circle in the south, Kanibil river and Sisiboraon circle in the east and Kumatia river and Gogamukh circle in the west. It has 299 nos of revenue villages with 18 nos of Lot Mondols.The police station is Dhemaji PS .its main rivers are Brahmaputra, Jiadhol, Kumatia, Laipulia Kanibil, Gainadi. This year (2011) on the basis of severeness, Dhemaji revenue circle has been divided into 3 zones. Zone -I consist of most vulnerable villages numbering 70. Sri Bhola Tamuly LM, will be in charge of this zone and he will be assisted by the following Lot Mondols- Parsmani Bora, Ratul Gogoi, Golap Borpatra Gohain, Hemchandra Gohain, Ajit Phukan, Tapan Handique, Debeswar Chetia, Lalit Gogoi, Rajen Gogoi, Arup Nath and the Gaon Burhas of the villages Zone- 2 consist of villages which falls in the southern part numbering 4 villages and Brajen Barua LM will be the in-charge of this zone and will be assisted by Sri Raju Khargharia LM, Sri Hukeswar Bhuyan LM and all the Gaonburhas. Zone -3 consist of the moderate flood prone villages numbering 31 and Sri Haren Gogoi LM will be in charge of this zone. and will be assisted by Sri Khageswar Das LM, Ramen Buragohain LM, Debeswar Chetia LM Dilip Bhuyan LM and all Gaonburhas of the villages Sisiborgaon revenue circle is located in the middle of Dhemaji Distrct and North East side of Dhemaji Sub-division.The Circle is bordered by Arunachal Pradesh to the north, Jonai Circle on the east,Dhemaji circle on the west and then mighty Brahmaputra on the south.The area of the circle is 921.6 sq. Km with a population of 2,34,172 as per census 2011..The area of this circle is a narrow strip of plains stretching from Brahmaputra to the foothills of Arunachal Pradesh. The main river affecting the area is Brahmaputra and its tributaries as Simen, Dimow, Jalakiasuti Gainadi .The flood in this basin is mainly caused by 2 factors –(1)Excessive rainfall in nearby Arunachal Pradesh hills (2)by bursting of blockades formed by landslides . The course of the river being shallow due to its proximity to Arunachal hills , changes its course frequently and carries huge amount of silt.There is 1 police station at Silapathar and 1 outpost at sisiborgaon .The revenue circle is having 380 nos of revenue villages. The most flood prone Panchayts are Namani Sisitangani,

Madhyasisitangani and Amguri. The Circle has identified 81 nos of highly flood prone villages with a population 29213.

RELIEF AND RESCUE OPERATIONS

On 15-08-2011, high floods occurred in Dhemaj District. This is due to incessant heavy raining in the foothills of Arunachal Pradesh and its adjoining areas for last 3(three) days (w.e.f. 14-08-2011 to 16-8-2011), the river gainadi, Jiadhal, Kumatia, nadi etc. were in full spate and inundated a huge area of Sissiborgaon, Dhemaji, Gogamukh and Jonai Circle. On 15/08-2011 at about 8.40 A.M suddenly, the flash flood occurred and the flood water of river Gai became violent and washed away a portion of about 40 Mts of the railway track and also a portion of about 150/180 Mts. (Fig-1 , 2)

Figure 1: Flash Flood in Gainadi on 15 Aug 2011

Figure 2: Flash Flood in Gainadi

Figure 3: Destruction of Property

Figure 4: Temporary Bamboo Bridge over Gainadi

Figure 5: NH 52 After Floods

As a result of the violent current of the flood water of river Gai has affected nearly 95 Nos. villages of Sissiborgaon Revenue Circle (Fig-3). Suddenly the violent current of the floodwater has washed away several dwelling houses of SissiborgaonTokowbari, Bhebeli, KerokaniMajgaon, Satulachuk, etc. villages under Sissiboprgaon Revenue Circle. Some of the affected families of the Village have been residing in 6 Nos. of makeshift camps set up in different places under proper care from District Administration. Necessary G.R materials have been distributed among affected families and the camp inmates. Mobile Medical team along with life saving drugs, have been distributed with proper care. Relief materials among affected families who have been residing in their houses have also been distributed as per the relief manual. Revenue staff, PRI members have also been engaged to look after situation and utmost care have been taken to provide medical and material help. The river Jiadhal also rising abnormally on the same day at about 12 P.M onwards causing damage to NH 52 near Kumatia Bridge disrupting communication to Dhemaji from the other parts of the State. Subsequently, due to subside of rain and the best efforts of B.R.O, the road communication has been restored on the next day (Fig-4). As soon as on receipt of the information, the District Administration Officials with Machine Boats of District Disaster Management Authority rushed to the spot and also requested the N.D.R.F. team stationed at Dhemaji to take necessary step for rescue of the person. The Air force helicopter had air lifted some marooned people immediately on request. The Army located in Likabali had rendered their service for rescue operation.

REHABILITATION PLAN

- A proposal for an amount of Rs3,52,40000/ has been submitted to Government for according sanction under rehabilitation grant to the houses damaged during the flood.
- Relief materials distributed – Rice 6593 Qntl,Dal 750 Qntl Salt 169 Qntl, M.oil 510 ltrs,Wheat Bran 350 Qntl, Tarpauline 7556 nos, Cloth 2514 family packets, Buckets 145 nos, Candle 1600 packets.
- Medical Facilities- 4 Nos of mobile medical teams and para medical staff with medicine have been deployed to visit the affected areas .
- Drinking water-400 nos of chemical packets ,6 pkt bleaching powder,10,000 nos halogen tabletsand 178 hand pumps were distributed and installed.
- 12 nos of relief camps were opened and 14 nos of boats were placed for rescue operation.

ROLE OF NGOs

There are 8 nos of NGOs actively involved in various activities under DDMA(District Disaster management authority) They have their volunteers trained in Search and Rescue and First aid and are placed in the Circles. They worked with IWT officials in Rescue as well as along with NDRF at Sisiborgaon and Dhemaji.

REACTION OF THE AFFECTED POPULATION

The affected ones were immediately shifted to safe places and the District Authority has provided all the essential items within 24 hrs. In some interior areas NDRF,IWT and Volunteers from DDMA engaged in rescue till midnight were well supported by the local community .Quick Response Teams (QRT) have been formed at all the circle along with 2 days training on Disaster management.

PREPAREDNESS AND MITIGATION MEASURES

Post flood, various training programmes have been conducted among the PRIs, locals and volunteers from all the circles on Rescue /first Aid and early warning by Civil Defence/Fire service and Police organization. School safety and mock drill on Disaster management and training of Teachers in school safety is going on regular basis.

OVERALL ANALYSIS

The district Administration information of the flash flood from different individuals telephonically at 10.30 am during the time of celebration of Independence Day and immediately rushed to the spot with rescue equipments and NDRF team. After assessing the gravity of the situation army helicopter was also called for rescue operation. Because of prompt and timely intervention of the authority many lives were saved.

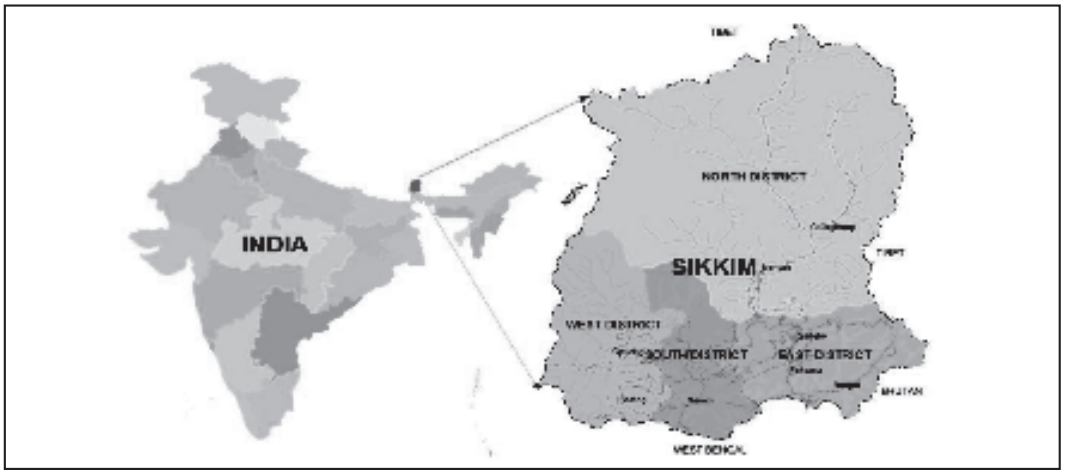
Disaster Management is a gray area which needs more focus. Although there are many training programs which are going on. However, there is a need of more presence of NDRF in places which are facing natural calamities regularly. The common people also need to be awared about the mitigation strategies which needs to be followed for reducing the destruction of life and property due to Floods and other disasters.

Disaster Management Scenario In Sikkim

Ravindra Kumar, IAS

Sikkim is situated between 27° 04' to 28° 07' North latitudes and 88° 01'to 88° 55' East longitudes. It is bound by Nepal in the west, vast stretches of the Tibetan plateau in the north and Bhutan and Chumbi Valley of Tibet in the east. Darjeeling district of West Bengal stretches along its southern boundary. The State of Sikkim has a total area of 7096 sq km. and is stretched over 112 kms from North to South and 64 kms from East to West. Sikkim is divided into four districts – East district, West district, North district and South district.

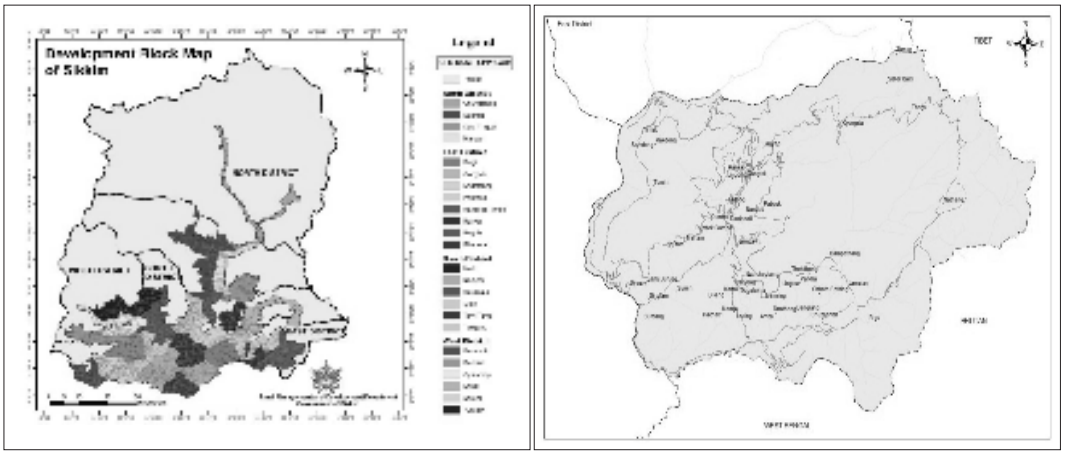
Figure 1: Location of Sikkim, India



SIKKIM AT A GLANCE

Area	7096Sq. km
Districts	4
Sub-Districts/ Divisions	9
Administrative Block	26
Villages/ Blocks Revenue	411
No. of Towns	9
Gram Panchayat Unit	166
Village / Ward	905
Population	607888
Density of population	85.61/sq. km
Total Households	111830

Source: State Socio-Economic Census 2006



Chapter 2

Sikkim is a small, extremely mountainous state in the Indian Himalayas with sharply defined and extremely steep watersheds. Although, Sikkim is only about forty miles in width and seventy miles in length, its altitude escalates rapidly from about 825 feet above mean sea level in the South to about 28,300 feet along the Himalayan Kanchenjunga range.

Sikkim has a diverse ecological condition from subtropical to alpine and is endowed with great biological diversity of plants and animals.

VISION

To build a safe and disaster resilient Sikkim by developing a holistic, proactive, multi- disaster oriented and technology driven strategy through a culture of prevention, mitigation, preparedness and response. With the capacity building and trainings provided, the community participation should be encouraged. The participation of community will guarantee local ownership, local needs and will provide effective volunteerism during the disaster. Hence, the disaster resilient community will ensure disaster resilient state.

THEME

The central theme is the belief that a disaster resilient community, duly empowered by a newly created DM Structure, working in cohesion multi-sectorally, will help realise the national vision.

OBJECTIVES

The aim of this plan is to set out Sikkim's approach to disaster management in accordance with the legislative responsibilities of the DM Act 2005.The objectives of preparing DM plan are:

I. Promoting a culture of prevention and preparedness by ensuring that DM receives the highest priority at all levels.

II. Ensuring that community is the most important stakeholder in the DM process.

III. Encouraging mitigation measures based on state-of-the-art technology and environmental sustainability.

IV. Mainstreaming DM concerns into the developmental planning process.

V. Putting in place a streamlined and institutional techno-legal framework for the creation of an enabling regulatory environment and a compliance regime.

VI. Developing contemporary forecasting and early warning systems backed by responsive and fail-safe communications and Information Technology (IT) support.

VII. Promoting a productive partnership with the media to create awareness and contributing towards capacity development.

VIII. Ensuring efficient response and relief with a caring approach towards the needs of the vulnerable sections of the society.

IX. Undertaking reconstruction as an opportunity to build disaster resilient structures and habitat.

X. Undertaking recovery to bring back the community to a better and safer level than the pre-disaster stage.

VULNERABILITY ASSESSMENT AND RISK ANALYSIS

MHRVA (Multi Hazards Risk Vulnerability Assessment) are being undertaken where the following hazards are considered for Sikkim as mountainous state as per IS codes and other requisite data from the field, which is required for Multi Hazards Risk Vulnerability Assessment Study in the Himalayan Region.

a) Earthquake hazards.

b) Landslide hazards.

c) Fire hazards.

d) Flood/ flash floods hazards.

e) Snow Avalanches hazards.

f) Drought hazards.

g) Hailstorm, Thundering and lightening hazards.

h) Riots and stamped.

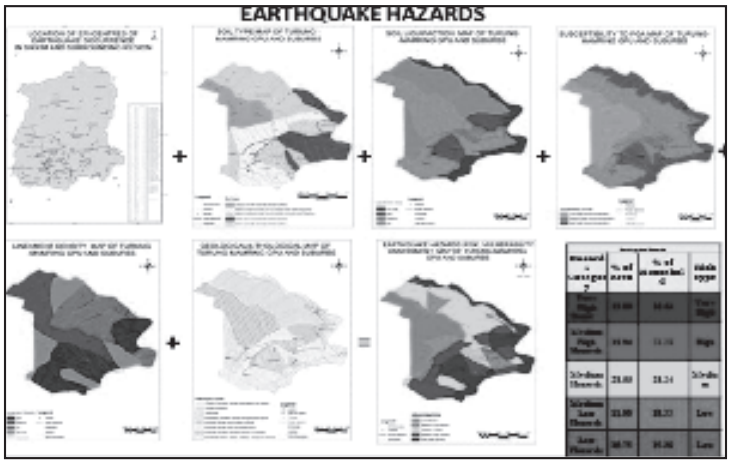
In every hazard following components or parameters are studied and identified.

a) Hazards areas identified in terms of its intensity and scale.

b) Risk Level is identified up to household levels.

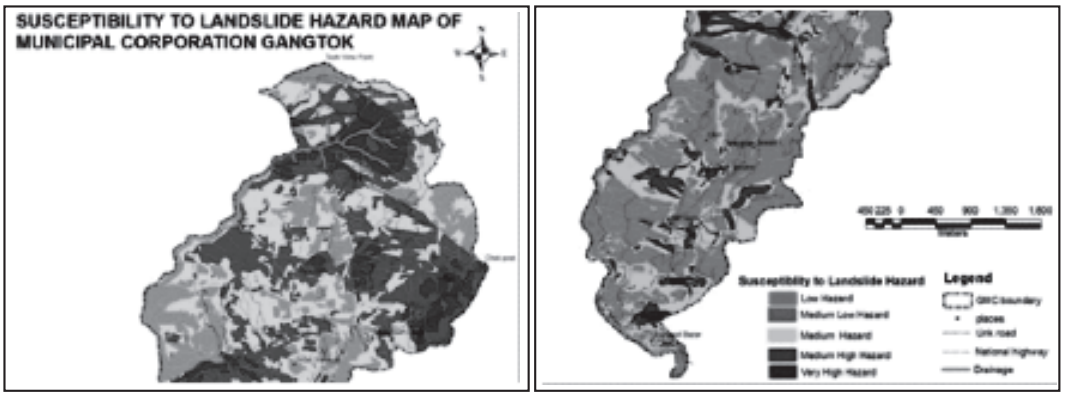
c) Vulnerable areas are identified.

Once the study of the entire State is complete it will be incorporated in SDMP. HRVA for Gangtok city of landslide study is incorporated in this plan.



Land Revenue and disaster Management Department is primarily concerned with revenue administration in the sate which encompasses survey and settlement operations, maintenance and up gradation of Land Records and enforcement of Land Laws in the State. With the new nomenclature of Land Revenue Department to Land Revenue and disaster Management Department there has been a paradigm shift in the management of disasters at Village to State Level. Apart from providing immediate relief to the victims of disasters the department is responsible for disaster prevention, mitigation and preparedness and as a nodal agency it has been implementing various Disaster Management Programs in the State.

Turung-Mamring GPU was taken up as a model study and is about to be published. Likewise same method is proposed to be adopted for HRVA mapping for other parts of Sikkim.



A HAZARD PROFILE OF THE STATE

Once the HRVA mapping for the entire state is completed, Hazards profile for the state will be prepared.

After HRVA mapping, assessment is done for different parts of the state to propose probable preventative/mitigative measures for the the hazards prone areas

NATURAL HAZARDS
Meteorological
• Cold Wave • Cloudburst • Hail-Storm • Flash Flood • Avalanches • Droughts • Forest Fire
Geological
• Earthquake, • Landslide / Debris Flow, • Erosion (with or without a disaster event)
• Soil Subsidence
Biological
• Epidemic Human Diseases, e.g. Chicken Pox outbreak, Swine Flu
• Animal and Plant Disease, e.g. Foot and Mouth, Rabies,
• Insect and Vermin Plague, e.g. Malaria
• Food Crop Disease e.g. Cardamom Yellow Pest
• Emerging Catastrophic Disease, e.g. Avian Influenza

MANMADE HAZARDS
• Civil Disturbance/Riot
Human-Caused
• Terrorist Aattack
Consequence Management
• Arson Poisoning • Sabotage of Essential Services
• Information Technology Virus
• Bridge Collapse
Technological Origin
• Dam Failure
• Failure in Critical Infrastructure
• Transport Accident
• Industrial Accident

EARLY WARNING AND DISSEMINATION SYSTEMS

Developing and implementing an effective early warning system requires contribution and coordination of a diverse range of individuals and groups. The groups that will be involved in early warning systems are:

- **Communities:** They should be actively involved in all aspects of establishment and operation of early warning systems. They should be aware of the hazards and potential

impacts to which they are exposed, and should be able to take actions to minimize the threat of loss or damage.

- **Local Governments**
- **Non-Governmental Organisations**
- **The Private Sector:** They play an important role in early warning, including developing early warning capabilities in their own organisations.
- **The Science and Academic Community:** They play a very critical role in early warning; they can provide specialized scientific and technical input to assist governments and communities in developing early warning systems.

MONITORING AND WARNING SERVICE

The aim is to establish an effective hazard monitoring and warning service with a sound scientific and technological basis. The key actors for monitoring and warning service will be National meteorological and hydrological services, specialised observatory and warning centers (e.g. for water), universities and research institutes, private sector equipment suppliers, telecommunications authorities, quality management experts, regional technical centers and UN agencies.

DISSEMINATION AND COMMUNICATION

The aim is to develop communication and dissemination systems to ensure people and communities are warned in advance of impending natural hazard events and facilitate appropriate coordination and information exchange. The key actors for dissemination and communication should be international, national and state disaster management agencies, meteorological and hydrological services; military and civil authorities; media organizations (print, television, radio and online); businesses in vulnerable sectors (e.g. tourism, aged care facilities); community based and grassroots organizations; international and UN agencies.

Response capability

The aim is to strengthen the ability of communities to respond to natural disasters through enhanced education of natural hazard risks, community participation and disaster preparedness. The key actors will be community-based and grassroots organizations; schools; universities; informal education sector; media (print, radio, television, on-line); technical agencies with specialized knowledge of hazards; international; national and local disaster management agencies; regional disaster management agencies; international and UN agencies.

PREVENTION AND MITIGATION PLAN

Prevention and mitigation plans including short, medium and long term with structural and non structural measures will be prepared once the Hazards Risk Vulnerability Assessment of the

state will be completed.

TRAINING NEEDS ANALYSIS AND DEVELOPMENT OF STATE HR PLAN

At present various type of training in context to management of the disasters are being provided to the various sections of the society. Mock drills are also conducted at all levels to make aware of the scenario of the disasters for preparedness to handle it. However, training calendars will be prepared and published in coordination and consultation with the Stake holders.

MAINSTREAMING DM CONCERNS INTO DEVELOPMENTAL PLANS / PROGRAMMES / PROJECTS

Mainstreaming DM concerns into developmental plans/ programmes/ projects are being formulated in following ways :

- Amendment of Building byelaws master plans for Earthquake resilient/ Landslide Management etc.
- Amendment of Building and Land use regulations
- Amendment in Town and Country Planning Legislations
- Regulations for Land use Zoning
- Additional Provisions in Developmental Control Regulations for Safety measures.
- All new projects/programmes should be revisited to build in DM resilience with regard to disasters.
- The building bylaws have been drafted and submitted to the government through Urban Development and Housing Department for Approval.

COMMUNITY BASED DISASTER MANAGEMENT

The first responder for disaster is the community. A critical element of sustainable disaster management is communities' participation. The most common elements of community involvement are partnership, participation, empowerment and ownership by the local people. The emphasis of disaster management efforts should focus on communities and the people who live in them. Unless the disaster management efforts are sustainable at individual and community level, it is difficult to reduce the losses and scale of tragedy. There needs to be an opportunity where people can be involved from the initial programming stage of disaster management activities.

Community Based Disaster management (CBDM) Preparedness Approach is a response mechanism to save life, livelihood, livestock and assets with available resources. It leads to multi-prolonged development interventions to address the root cause of vulnerability. The activities of CBDM Preparedness include:

FORMATION OF COMMITTEE AT VILLAGE (VDMC)

The village disaster management committee consists of:

(b) Availability and procurement of resources.

(c) Requirement of facilities like ICP, Staging Area, Incident Base, Camp, Relief Camp, etc.

(d) Availability and requirements of Communication System.

(e) Weather Forecast behaviour from IMD; and

(f) Any other information required for response from all available sources and analyse the situation.

II. Determine incident objectives and strategies based on the available information and resources;

III. Establish immediate priorities, including search & rescue and relief distribution strategies;

IV. Assess requirements for maintenance of law and order, traffic etc. if any at the incident site, and make arrangements with help of the local police;

V. Brief higher authorities about the situation as per incident briefing form –IRS-001 and request for additional resources, if required;

(b) General Staff:

The General staff shall comprise of the Operations Section (OS), Planning Section (PS) and Logistics Section (LS).

OPERATIONS SECTION (OS) :

The OS deals with all types of field level tactical operations directly applicable to the management of an incident. An Operation Section Chief (OSC) heads this section. A deputy may be appointed to assist the OSC for discharging his functions depending on the magnitude of the workload. OS is further sub-divided into Branches, Divisions and Groups which assist the OSC / IC in the execution of the field operations. The OS comprises of Response Branch (RB), Transportation Branch (TB) and Staging Area (SA).

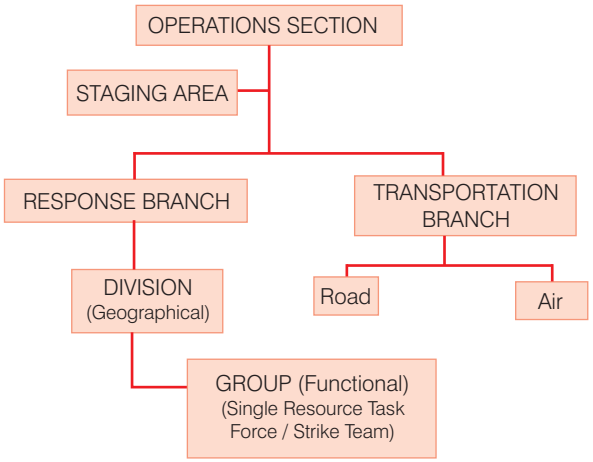
PLANNING SECTION (PS)

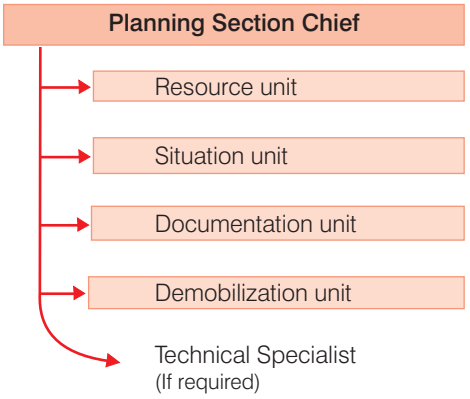
Planning Section comprises of Resource Unit, Situation Unit, Documentation Unit and Demobilisation Unit. A chief known as Planning Section Chief heads the Section. The PSC is responsible for collection, evaluation, dissemination and use of information. It keeps track of the developing scenario and status of the resources. In case of need, the PS may also have Technical Specialist for addressing the technical planning matters in the management of an incident. A list of such specialists will be kept available in the PS. The PSC reports to the IC and will be responsible for the activation of Units and deployment of personnel in his Section as per requirement.

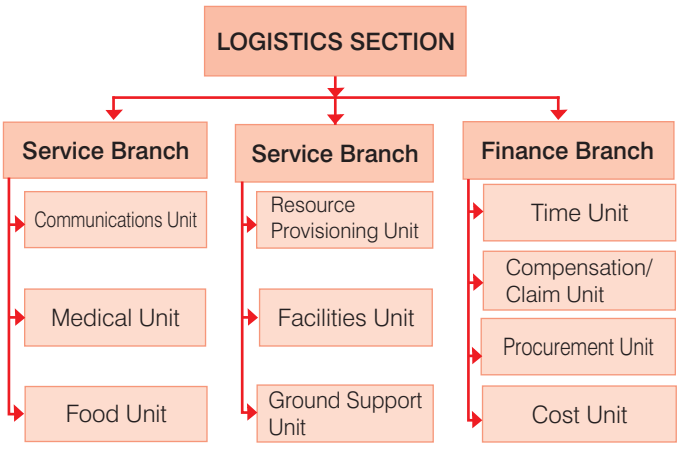
LOGISTICS SECTION (LS)

LS provides all logistic support for effective response management. The Units under different Branches of the LS are responsible not only for the supply of various 'kinds' and 'types' of

resources, but also for the setting up of different facilities like the Incident Base, Camp, ICP and Relief Camp etc. This would entail the involvement of several line departments of Government




Planning Section Chief
Resource unit
Situation unit
Documentation unit
Demobilization unit
Technical Specialist
(If required)


LOGISTICS SECTION
Service Branch
Communications Unit
Medical Unit
Food Unit
Service Branch
Resource Provisioning Unit
Facilities Unit
Ground Support Unit
Finance Branch
Time Unit
Compensation/ Claim Unit
Procurement Unit
Cost Unit

EMERGENCY OPERATION CENTRES

Emergency Operation Centres are as follows:

a. Local Emergency Operation Centre – LEOC

b. District Emergency Operation Centre – DEOC, and

c. State Emergency Operation Centre – SEOC.

Responsibility to respond to an event lies with the local committee, coordinated through the LEOC. Requests and confirmation about resources and passage of information are passed between emergency operation centres to support the disaster management committees. These clear lines of communication allow for an effective and measured response to a disaster event.

LOCAL EMERGENCY OPERATION CENTRE – LEOC

LEOC may be permanent or temporary facilities provided within each local government area or combined local government area to support the local committee during disasters. Each LEOC is responsible to provide prompt and relevant information to the DEOC concerning any disaster event or potential disaster event occurring within their area. These centres are also responsible for the coordination of all local resources as well as those allocated to it for disaster management purposes.

In particular, LEOC is responsible for:

Collection, collation and dissemination of information to the DEOC, relevant local agencies and officers, and the public.

Implementation of operational decisions for the Chair of the Local Committee and

Coordination of available resources including those allocated from the State Government and Disaster district, in support of the disaster affected community.

DISTRICT EMERGENCY OPERATION CENTRES, DEOC

DEOC may be permanent or temporary facilities provided within each District to support the District Authority during disaster events. Each DEOC is responsible to provide prompt and relevant information to both LEOCs and the SEOC concerning any disaster event occurring within their District. These centres are also responsible for the coordination of all local and state resources within their district and those allocated to it for disaster management purposes.

In particular, a DEOC is responsible for:

a. Collection, collation and dissemination of information to the SEOC, relevant Local government Disaster EOC, and the public

b. The provision of advice to the Chair(s) of relevant Local Committees

c. Implementation of operational decisions of the Disaster District Chair, and

d. Coordination of allocated Local, District and State government resources in support of the disaster affected community.

STATE EMERGENCY OPERATION CENTRE, SEOC

SEOC has a small permanent cadre staff and a continuous Duty Officer system to monitor events within the State on behalf of the State Authority. When activated in support of disaster-affected communities, the SEOC establishes communication with relevant DEOC for the purpose of coordinating necessary information and resource support. The SEOC provides 'situational awareness' of disaster events to the State Government and is accountable to the State Executive Committee.

The functions carried out in the SEOC include the:

a. Collection, collation and dissemination of information to the State government, the Minister for LR&DMD, the Chair and members of the SEC, Disaster districts and the public

b. Provision of advice to the Disaster District Chair and Chairs of Local Committee, and

c. Coordination of District and State Government resources in support of disaster affected communities.

COORDINATION AND IMPLEMENTATION

The State Disaster Management arrangements are based upon partnerships between State and Local governments. These partnerships recognize that each level of the disaster management arrangements must work collaboratively to ensure the effective coordination of planning, services, information and resources necessary for comprehensive disaster management.

The SDMP tier's disaster management arrangements are based on bottom to top approach i.e. local, district and state level. The tier system enables a progressive escalation of support and assistance.

The arrangements comprises of several key management and coordination structures. The principal structures that make up the Arrangements are:

(A) Disaster management committee operates at local, district and state level. The committee is responsible for planning, organising, coordinating and implementing all measures required to mitigate, prevent, prepare, respond and recover from disaster.

(B) Emergency Operation Centres at local, district and state level supports disaster management groups while coordinating information, resources, and services necessary for disaster operations.

(C) State government functional agencies, SDMA and SEC, are responsible to coordinate and manage specific threats and provide support to Disaster district on and as required.

ARRANGEMENTS AT LOCAL LEVEL

Local government is the key management agency for disaster events at local level. Local government provides specific disaster management at community level giving its knowledge and understanding of social, environmental and economic issues at the local level. Local government achieves coordinated disaster management approach through "Local Disaster Management committees".

MEMBERSHIP OF THE LOCAL COMMITTEE

Membership of the Local Committee generally comprises of: (I) Urban Level Disaster Management Committee:

(a) Chair (the Mayor, or a councillor nominated by the Mayor);

(b) Bazaar Officer (a Local government staff member); (II) Block Disaster Management Committee:

(a) Chair (the BDO); (b) ZillaPanchayat (the Elected member)

(III) GPU Disaster Management Committee:

(a) Chair (the Sabhapati of the GPU);

(b) Two members from each GP Ward Committee; (IV)GP Ward Disaster Management Committee:

(a) Chair (the Elected Panchayat member);(b) Ex-army, Para-Military or Police personnel/ Youth Leader or Members of CBO/SHG);

FUNCTIONS OF THE LOCAL COMMITTEE

The functions of the Local Committee is to:

(a) To ensure that disaster management and disaster operations in the area are consistent with the state DM policy for disaster management for the state;

(b) To develop effective disaster management, and regularly review and assess the disaster management arrangements at the local level;

(c) To help the Local government to prepare a local disaster management plan for its area;

ARRANGEMENTS AT DISTRICT LEVEL

Sikkim has four districts; each of these Districts has a District Disaster Management Authority (DDMA), to coordinate regional level whole-of-government support for disaster events.

MEMBERSHIP OF THE DISTRICT DISASTER MANAGEMENT AUTHORITY

District Disaster Management Authority consists of following members:

(a) The District Collector / Chairman or Chief Executive Officer, who is also the chairperson of the group

(b) The ZillaAdhakyasha, the elected member of the local authority is the Co-Chairman;

(c) The Addl. District Collector, Executive Officer or Member Secretary;

(d) The Superintendent of Police as the member of the District Authority;

(e) The Chief Medical Officer as the member of the District Authority;

(f) Any other person appointed by the State Executive Committee of the State Authority that the State Executive Committee considers appropriate to be a member of the District Authority, regarding effective disaster management for the Disaster district.

FUNCTIONS OF THE DISTRICT AUTHORITY

DISTRICT PROJECT OFFICER / DISASTER MANAGEMENT

The DPO/DM has the following responsibilities:

(a) Managing and coordinating the functioning of the DDMA;

(b) Ensuring that the District Authority performs its functions;

(c) Coordinating disaster operations in the Disaster district for the District Authority; and

(d) Reporting regularly to the State authority on the performance of the District Authority.

ARRANGEMENTS AT STATE LEVEL

The State group is the peak policy and planning group for disaster management in Sikkim. It is established under the DM Act 2005, section 14, as the principal organization for the purposes of disaster management throughout the State. In particular, the State group is responsible for disaster mitigation and disaster planning and preparation at a State level and for coordinating whole-of-government response and recovery operations prior to, during and after an event. This includes accessing inter- district and state government assistance when local and district resources are exhausted or not available.

CHAIR

The Chair of the State Disaster Management Authority is the Chief Minister of the State Sikkim.

DEPUTY CHAIR

The Deputy Chair of the State Authority is amongst the members of SDMA nominated by the Chair.

STATE EXECUTIVE COMMITTEE (SEC)

The State Executive Committee (SEC) provides a focal point for the development and implementation of comprehensive disaster management plans, education and awareness strategies for Sikkim. It is the primary mechanism through which State-level support is provided to disaster-stricken communities, in both the response and recovery phases. SEC members

are designated liaison officers from each of the Departments represented on the State Disaster Management Authority.

SIKKIM GOVERNMENT ARRANGEMENTS

Prime responsibility for the protection of life, property and the environment rests with the State government and District government. However, the state government is committed to support State and Districts in developing their capacity for dealing with emergencies and disasters, and it provides physical assistance to State or Districts when they cannot reasonably cope during an emergency. At the National level NDMA is responsible for dealing with disaster and emergencies.

Land Revenue & Disaster Management Department, LR&DMD is nominated as the department responsible for planning and coordinating state government's physical assistance to the states and territories. Coordination of these functions is carried out by the National Disaster Management Authority, (NDMA). Similarly, developing and training on Disaster Management is carried out by National Institute of Disaster Management, (NIDM).

The Chairs of the respective Disaster Management Authorities can initiate activation of the arrangements at district and local level. The District Project Officer (DPO) in consultation with the Chair of a Local Authority may request activation of that Local Committee based on risk assessment and potential community consequences. Advice of activation must be conveyed to the EO of the District Disaster Management Authority.

Activation of State level arrangements can be initiated by:

The Chair, State Authority, and

The Chairman, State Executive Committee

Activation at State level will be in response to activation at district level or severe impact at a local level. Activation does not necessarily mean the convening of authorities rather it means the provision of information to group members, regarding the risks associated with a pending hazard impact.

Disaster Management – Mega Mock-Drill at Panchkula

Vinay Pratap Singh, IAS

DISASTER MANAGEMENT REGIME IN INDIA

In India almost each part of the country lies in danger zone of one type of disaster or another whether man-made or natural. Traditionally disaster management regime in India has been reactive and concept of pro-activeness was absent. This resulted in loss of life and property every year from disasters like floods, cyclones, droughts, landslides, fires and earthquakes.

Thus government decided to change this regime to prevention, mitigation and preparedness by enacting Disaster Management Act 2005. It envisaged a multi-level system of disaster manageament at Center, state and district level by forming NDMA, SDMAs and DDMAs. It required each state and district to formulate their own disaster management plans. Though the act had been enacted long back but it still lacks its enforcement in totality due to lack of awareness and apathy of officials.

Thus NDMA started with plans to conduct mock drills and awareness generation programmes round the year in different parts of the country. Its biggest effort has been to start yearly mega mock-drills in earthquake prone regions for checking preparedness of administration and awareness generation among public. Starting from Delhi in 2012, NDMA chose Chandigarh-Panchkula-Mohali and Shimla as its target for 2013. A hypothetical scenario was generated simulating a Mw 8 earthquake in Mandi district of HP. 60 sites for disaster mock drills were

identified by these 4 cities and simultaneous exercise was conducted at these sites. This made it the biggest multi state mock drill ever conducted in India.

MW 8, MANDI EARTHQUAKE SCENARIO: MULTI-STATE EXERCISE AND AWARENESS CAMPAIGN

Panchkula is a planned city adjoining UT of Chandigarh. Panchkula has picturesque sites owing to its location at the foothills of the shiwalik mountain ranges. This beautiful location has led to many hazards in the form of floods, landslides and earthquake. Out of these hazards earthquakes are the most dangerous and at the same time unpredictable too. Panchkula is located at the region where Indian Plate is colliding with Tibetian Plate and thus leading to formation of Himalayas. This formation also leads to generation of stress and faults in the geological structure and thus increases chances of earthquake.

Earthquakes are the worst of natural disasters which cause damage to life and property and cannot be predicted or prevented. Panchkula lies in the Zone IV of seismic vulnerability and thus special focus has been put by NDMA on this region. After conducting a mega mock drill in NCR in 2012, NDMA had selected tricities of Chandigarh-Mohali-Panchkula and Shimla for mega mock drill in 2013. Thus a hypothetical scenario was scientifically developed replicating the Kangra earthquake of 1905 which covered Himachal Pradesh, Punjab, Haryana and UT of Chandigarh. This was done to check the vulnerability of this region and assess likely damage in event of earthquake of high magnitude.

The main objective of the mega mock drill is to:

1) Spread awareness among government organisations and public about hazards of earthquake
2) To aid in preparation of response plans
3) To facilitate inter-departmental and inter-state co-ordination.

Thus an earthquake scenario was developed by earthquake engineering experts of NDMA from IIT Bombay & Madras, Wadia Institute of Himalayan Geology, Seismology Devision of IMD and Geological Survey of India. Epicenter was simulated at sundernagar in Mandi district which is in seismic zone V resulting in intense shaking in nearby states. Epicenter was located at Main Boundary Thrust at depth of 15 kms. Intensity of IX on MSK scale was projected to be experienced in parts of HP, Punjab and Haryana. It was projected that in all 40 districts would experience the intensity of more than VIII on MSK scale. As per 2011 census, a population of around 3.6 crore would lie in regions experiencing more than VIII intensity on MSK scale.

PRE-MOCK DRILL PREPARATION PHASE

NDMA after its constitution in year 2005, started conducting yearly mega level mock drills from year 2012, with first drill conducted in National Capital Territory of Delhi. In 2013 states of Punjab, Haryana, Himachal Pradesh and UT of Chandigarh were selected for conducting multi

state mega mock drill and awareness generation campaign owing to their location in zone-IV of seismic zone. Thus February 13th, 2013 was decided as the date for conducting multi-state mega mock drill in tri-cities of Chandigarh, Mohali, Panchkula and Shimla. This was a first time experience for NDMA in which it was conducting a mega mock drill involving multiple state partners. A funding to the tune of Rs. 30 lakhs was sanctioned for each of the 4 cities.

The ball started rolling 6 months prior to the decided date of mock drill. Since it was a multi-state exercise, it involved coordination with other state governments, NDMA, subject experts and NDRF teams. There were lots of meeting called by NDMA at their headquarter in Delhi regarding preparations pertaining to setting up of Unified Command at Chandigarh, deciding location of Camp Offices of NDMA at Chandigarh and Shimla and infrastructure support and deciding sites for mock drills, media plan etc.

It was decided to set up Central Co-ordination Center for Tricities at Chandigarh and a Control Room at Shimla. It was also decided that only means of communication would be wireless communication and mock-drill sites should communicate with Central Co-ordination Center and Control room through these communication systems only. It was further decided that camp office of NDMA would be set up at Chandigarh and Shimla and officials of NDMA and NDRF would be stationed there. A Training programme was also scheduled for officers of 4 cities before the mock-drill. It was decided that 30 teams of NDRF (10 each from Bhatinda, Noida and Gandhi Nagar Bns.) would participate at 60 sites identified for mock-drill and states would provide logistical support to teams. A detailed phase wise programme for media briefing was also chalked out. Some of the tasks decided in preparatory meetings were like, selection of sites, detailing of volunteers for role play as injured/evacuee, earmarking of nodal hospitals, rehearsal by districts between 6-11th Feb, briefing of Observers by NDMA on 12th Feb, Mock exercise on 13th Feb followed by spot debriefing site wise, final hot-wash for all states with Army Observers on 14th Feb and Action taken Report submission on 28th Feb.

In total 60 sites were to be selected across 4 cities which would be participating in the mock drill. They may include railway stations, government offices, shopping complexes, schools, bus stands, hotels, hospitals, cinema halls, residential buildings, airport, colleges, industries, petrol pumps, religious places and other public places etc. Unified Command was to be setup at Chandigarh, State level Emergency Operation Centers (EOC) in state secretariats and District level EOCs in the offices of respective Deputy Commissioners. At each of these EOCs NDMA staff was to be deputed during the exercise.

Thus we started identification of disaster sites from above mentioned categories and after checking their adequacy on all the parameters, we selected 15 sites which included government offices, hospitals, colleges, hotel, market area, industries, gurudwara and bus stand. These 15 sites were further divided into 3 zones which were headed by Area commanders. In addition, 2 relief camp sites were also identified at stadium and auditorium.

SETTING UP OF EMERGENCY OPERATION CENTER (EOC)

At district level, an EOC was to be setup to act as a focal point of disaster management

faces from earthquakes and means by which loss can be prevented/mitigated, a detailed media plan was needed to be prepared. Department of Public Relations formulated a media plan which included communication through media like newspapers, sensitization workshops, coverage of mock drill by channels, nukkadnataks, rallies, posters, radio channels, appointing goodwill ambassador, hoardings, SMSs etc.

As per media plan, newspaper advertisements were issued in prominent English and Hindi newspapers on and before the date selected for mega mock drill to make people aware the mock drill. On the day of the mock-drill, an advisory was issued in newspapers showing disaster sites and alternative routes to be used by public to avoid any inconvenience. Sensitization workshops were organized for Judges of Punjab & Haryana High court, MLAs, sarpanches and government officials. Yuvraj Singh, cricketer was made the goodwill ambassador the mega mock-drill and his message was broadcasted through radio channels. Nukkadnataks and street play were organized in association with North Zone Cultural council theatre groups. Rallies were organized in association with school and college students. Painting, slogan and poster making competitions on theme of disaster preparedness were organized in schools and colleges prior to mock-drill to spread awareness among students. Posters and hoardings were installed at prominent places giving information about earthquake hazards and suitable responses. Radio channels like My FM, Big FM and FM Rainbow were used to spread awareness about the mega mock drill. SMSs based messages were also sent to residents of Panchkula giving details about the mock-drill.

Apart from these, a Media and Information Officer (MIO) was appointed by Deputy Commissioner, who was made responsible for collecting all the information from disaster sites, relief camps, hospitals etc. and conducting press conference to release information to the print and electronic media. MIO was also given responsibility to make sure that print/electronic media gives adequate publicity to the mega mock drill so that public can be made aware about the earthquake risk mitigation. Besides this, Public Relations Officers (PROs) were appointed by Police and Civil hospital for giving information about victims/injured. At each site, Incident Commanders were also authorized to make press briefings at the disaster sites.

In disaster situations, people generally need information about their family members and relatives. Thus helpline numbers need to be publicized from which information about injured/evacuee/lost persons can be obtained anytime. In disaster situations there is propensity of spread of rumors, thus it should be made sure that correct information flows from disaster sites, hospitals, relief camps etc. to EOCs so that rumors can be stopped from spreading. Flow of correct information also helps in assessing the right level of damage at a site and sending adequate resources to the affected area. Managing press is also becoming a tough task. Media acts over-aggressive sometimes and reduces its reporting to just fault finding and bureaucracy bashing exercise. Similar thing happened in the press coverage given by newspapers to mock-drill, instead of highlighting the means to mitigate earthquake risk,

articles focused just on trivial issues like inconvenience caused by the mock-drill, glitches in rescue operations at some sites etc. Thus managing media becomes an important task for

help in responding to disaster situations promptly and thus helps in mitigating the effects of the disaster to considerable level. It is often found that administration is not aware of the quantity and quality of resources it has at various locations. In the absence of details about man and material resources available with the administration, crucial time is often lost in assessing the resources and requisitioning them from different locations. It has also been observed that administration has to rely on help from outer agencies and nearby areas even when their own resources lie untapped owing to lack of knowledge about them. Absence of ready inventory of resources with administration also leads to disproportionate deployment of resources at disaster sites. It is also often observed that additional resources are procured in times of emergency, thus putting extra financial burden on limited finances, even when resources are present locally. In times of disaster, it is also found that resources procured earlier for disaster response become unusable owing to lack of maintenance and thus delay the response of administration to disasters.

Thus as a preparation for mega mock drill we started preparing an inventory of human and material resources available with the departments in the district. For this we had given preset templates to each department asking for information about employees on their rolls and resources available with them. Detailed list of employees whether permanent or contractual along with their contact numbers and addresses was obtained from all the departments. Information about material resources like transport vehicles, fuel, food stuff, tools, earthmoving vehicles, storage houses/godowns, guest houses etc. was also obtained from departments. Contact numbers of nodal officers from nearby districts, railway department, airport, central paramilitary forces, NDRF, armed forces etc. have also been obtained so that their help can be obtained in times of disasters which are beyond control of district administration. Similarly warehouses, storage godowns, land for putting up temporary camps and staging areas etc. were also identified so that they can be used for accommodating evacuee and relief material. Then a detailed list was compiled and made available at EOC.

In next phase we are planning to implement GIS based mapping of all material resources available in the district so that information about their location and number can be easily obtained using internet. This would help in making decision support system more robust. A yearly programme for checking the condition of material resources has been initiated under which heads of each departments would certify that resources under their command are in usable condition and can be made available for disaster response operations. A pan-India initiative has been started by NDMA in the form of Indian Disaster Resource Network (IDRN) where districts are given responsibility of uploading resources available with them. Once this portal is fully activated then, resources would be easily mapped and their deployment would become more systematic.

We had to face lots of problems in compiling resource inventory as line departments were reluctant to give information about their human and material resources as there is tendency in

departments to not spare their resources for works which are not directly related to them as traditional thought has been that disaster management is not a baby of line departments and

related to flood protection works carried out in earlier years, this was leading to neglect of few areas and duplication in others. Thus we decided to include works carried out in last 5 years in the plan so that officials can track the location and effectiveness of works done in earlier years.

IRS also desires that SOPs of frontline departments should be finalized and made available to all their offices so that staff knows exactly what is expected of them in times of disaster. These SOPs were missing before the mega mock drill, thus we aided different frontline departments like Police, Fire, Health, Power, Civil Defence/Home guards, Public Health etc. in framing their SOPs to respond to disaster situations. These SOPs detail out the step wise response which officials are expected to do when an emergency message reaches them. It clearly demarcates the roles which have to be played by officials at each level. These SOPs act as guide books for departments to streamline their response efforts in times of disasters and thus reduce response time.

ROLES PLAYED BY LINE DEPARTMENTS

Fire-fighting System

Fire incidents are one of the major hazards which cause a huge loss to life and property. Fire disasters are generally man-made disasters and wild forest fires only can be categorized as natural disaster. Fire incidents may be triggered by other incidents like leakage of combustible gases, short circuit of electrical networks, earthquakes, industrial accidents, friction between trees during hot weather etc. Due to fire incidents being primarily man-made, they have a high propensity of occurring in human habitations especially large urban cities.

Panchkula is a planned city located adjoining to Union Territory of Chandigarh. It is a relatively new city and is growing rapidly in terms of population and area limits. Panchkula district has a population of around 5.5 lakhs, with city area under Municipal Corporation amounting to 3 lakhs population. Based on the new concept of vertical extension of city, Panchkula has seen growth of large number of high-rise multi-storey buildings like government buildings, high-end hotels, group housing societies etc. approximating to 200 in number.As a preparatory exercise for mega mock drill we did a 3 component audit of fire services – building, equipment and manpower.

Building

District has two fire stations, one located in heart of Panchkula city and another at congested town of Kalka. After conducting inspection of fire station in panchkula city, we came to a conclusion that there was a need for constructing 2 more fire stations in city. Panchkula city can be geographically divided into 3 areas – Mansa Devi Complex (MDC) area, Sectors 1-19 and sectors beyond Shimla highway. Thus to cater all the 3 areas we identified two more sites – one in MDC area and another in sector 20 beyond Shimla highway. Proposals for these 2 more fire stations have been sent to government for sanctioning and construction would start soon after

sanction is granted. On inspection of Kalka fire station which serves the towns of kalka and Pinjore, it was found that the station is located in a congested area and is linked to main road by

force in states on lines of NDRF so that response times can be reduced.

Health Department

Medical first aid in 'golden hour' is most crucial in saving lives of injured and victims at a disaster site. If victims get medical aid during initial stage and are then referred to hospitals if the injury is grave, then loss of lives can be reduced substantially. Health department thus plays a very crucial role in determining the number of casualities due to a disaster.

During mock drill, some nodal hospitals were identified which were asked to be ready to handle surge of patients being brought from disaster site. A list of all hospitals and dispensaries in district was made along with ambulances available with them. This would come handy in times of disasters of large extent. List containing contact numbers and addresses of all government doctors and para-medical staff posted in district was prepared and made available at EOC. Civil Surgeon was nodal officer for health department. He was asked to deploy medical staff along with ambulance at each incident site. Each medical team was asked to reach the site as soon as they get the message and set up a temporary medical first aid post near the site. This team was then instructed to do a triage of evacuated persons. Triage is a simple exercise of distinguishing extent of injuries of victims by use of coloured bands. These colour bands have different significance eg. Green colour means victim has not suffered any injuries, yellow means that victim needs first aid only, red means victim needs to be referred to hospital immediately as condition is critical and black means that victim is dead. Based on the colour of bands tied to limbs of victims after preliminary inspection by doctors, they are given different priority in medical care.

After the triage is done on victims, then red and yellow coloured band victims are shifted to nearby hospital using ambulances. Black band victims are brought to mortuary where their identity is found and postmortem proceedings are done. At the hospitals, disaster specific wards are alerted and their capacity is increased to deal with surge of patients. Trauma/emergency centers of hospitals are manned with extra staff and bed capacity of wards is increased by making temporary arrangements. Readymade kits containing medicines related to specific types of injuries are kept ready. Details of all the patients brought to hospitals are released every evening in form of lists and medical bulletins so that family members of victims can trace them. For this purpose helplines are also started.

It was observed that medical staff is not trained for disaster related duties and they can just handle peace time rush of patients. Infrastructure is also not adequate to cater to surge of patients. Thus there is a need to train a team of medical staff in each district who can become specialized in disaster related duties. Similarly there is a need to include disaster management in curriculum of doctors so that they can expand the facilities in short period of time for dealing with surge of patients.

Civil Defence And Home Guards

Civil defence and home guards are first line of response in any search and rescue operation. These forces are raised to aid the local police in its duties. Civil defence personnel are trained in

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SYNOPSES

DISASTER MANAGEMENT REGIME IN INDIA

- Traditionally disaster management regime has been responsive
- Disaster Management Act 2005 has put focus on prevention, preparedness and mitigation and rehabilitation.
- 3 level institutions – NDMA, SDMA and DDMA have been put into place
- Districts have formulated their disaster management plans

MW 8, MANDI EARTHQUAKE SCENARIO: MULTI-STATE EXERCISE AND AWARENESS CAMPAIGN

- Panchkula is situated in zone IV of seismicity due to its location near faults in Himalayas.
- A hypothetical scenario of Mw 8 earthquake in Kangra was created by experts and loss of lives in affected region was predicted.
- Mega mock drill was planned to boost the preparation levels and to spread mass awareness

PRE-MOCK DRILL PREPARATION PHASE

- Meetings were called by NDMA at Delhi and Chandigarh regarding preparations needed to be done by participating states regarding setting up of Unified Command, Emergency Operation Centers, funding mechanism, training workshops, communication systems to be used, logistic support to NDRF teams, media plan, identification of drill sites and nodal hospitals, formation of Incident Response Teams (IRTs), revision of district disaster management plans and formulation of SOPs of frontline departments.

IDENTIFICATION OF INCIDENT SITES

- Disaster sites were identified from public places like offices, hospitals, colleges, hotels, market area, industrial unit, bus stand and religious place.

SETTING UP OF EMERGENCY OPERATION CENTER (EOC)

Chapter 3

- SOPs for all frontline departments were made so that they can use these documents for systematic response in times of emergency.

ROLES PLAYED BY LINE DEPARTMENTS

FIRE-FIGHTING SYSTEM

- Three component audit of fire-services – Building, Man-power and Equipments, should be done on yearly basis.
- Kind of training and equipments available with fire-fighting staff should depend on needs of the district. E.g. high rise buildings, industrial units, fuel stores, power stations etc.

POLICE DEPLOYMENT

- Police acts as first responders in disaster situations.
- They have a responsibility of traffic management, maintain law and order, cordon off the operation area, assist in search and rescue operation and provide security for VIP visits.
- Police should be prepared with detailed route maps, wireless communication equipments and anti-riot gear.
- Police needs to be sensitized about disaster management regime and in each district a dedicated Quick Response Team (QRT) should be raised for disaster situations.
- State should raise SDRFs on the lines of NDRFs to reduce response times.

HEALTH DEPARTMENT

- They act as medical first responders. They are required to setup first aid post at incident site and carry triage on victims. Based on triage, victims are given medical treatment.
- Nodal hospitals were activated for handling surge of patients. At nodal hospitals, doctors receive the injured and shift them to dedicated wards.
- There is need to upgrade surge capacity of hospitals and include disaster related training in curriculum of medical studies.

CIVIL DEFENCE AND HOME GUARDS

- Frontline force in search and rescue operations.
- Needs infrastructure and training support.

DISTRICT RED CROSS

- Can help in setting relief camps, provide clothing, ration, blankets etc.
- Activate blood banks and organize emergency blood donation camps .
- Food and supply department – provide for fuel supply, dry grains and ready to eat food
- Public Health department – water supply, sanitation and toilet facility

Disaster Management – Mega Mock-Drill at Panchkula

- Power department – emergency lights and inflatable lighting towers at incident sites, generators at lifeline buildings, cut off power during SAR operation

Chapter 3

Disaster Management – Mega Mock-Drill at Panchkula

Chapter 3

Chapter 3

Chapter 3

Role of District Administration on Disaster Management in Tinsukia, Assam

Anant Lal Gyani, IAS

The word disaster is coming from a French word Disaster -meaning bad or evil star. However this is a very narrow conception of disaster and in our context, any disaster means a situation in which there is a sudden disruption of normalcy within society causing widespread damage to life and property. Natural Disaster is a part of our own earth so we can neither avoid it nor is it possible to prevent natural disaster altogether. But its effects can be reduced through systematic approach by Disaster Management initiatives. It can be an effective tool for saving valuable human lives and mitigation of human misery. It is not possible to do away with the devastation due to natural hazards completely. However, destruction from natural hazards can be minimized by the presence of well-functioning warning system, combined with preparedness on the part of the vulnerable community. Disaster management may be seen as a part of good governance.

To minimize the destruction of disaster there are four phases of emergency management¬Mitigation, Preparedness, Response and Recovery. The four phases are visualized as having a circular relationship to each other (Emergency Management Cycle). Mitigation refers to activities, which actually eliminate or reduce the vulnerability or chance of occurrence or the effect of a disaster. Mitigation phases begins with conducting hazards identification and vulnerability analysis – a two¬step process. First the hazard is identified which has the potential of affecting the population. Secondly, how people, property and structure will be affected by the disastrous event. Preparedness is a state of being ready to react promptly and effectively in the event of an emergency. Being preparedness means that a plan of action exist for an emergency so that it is clear as to what to do before the emergency occurs. Preparedness measures to be undertaken depends upon the analysis of the hazards severity and vulnerability, which is also the basis for deciding mitigation strategy. In some cases, such as flood or hurricane, an early warning gives several hours to act. However, often no prior warning impending emergency, such as the earthquake, tornadoes, explosion, major fire is possible. Preparedness for any emergency, especially those, which strike without notice, requires a plan. It is essential to identify the resource available and ways to utilize them. It must also be reasonably certain that the plan will work in an emergency situation.

The purpose of a plan is to provide a systematic way of responding to an emergency situation. The following aspects should be taken into consideration in the development of a Disaster Management Plan Objectives:- The district is very vulnerable to natural disaster mainly

exposed to Erosion and floods, and secondly earthquake is also a probable threat. Here it may be mentioned that the district experienced a terrible earthquake in 1897, due to which the town has at once submerged in water. Experience from earlier disaster, we have to prepare a disaster management plan to make Tinsukia a disaster resilient district .The main objectives of the plan are

- To rescue and evacuate trapped people
- To provide first aid to the injured
- To take care of children , women and disabled people
- To transfer the seriously injured and people needing urgent medical attention to hospitals
- To restore communication network and essential services
- To clear debris blocking roads and communication network
- To provide shelter and relief to homeless people
- To arrange for food and drinking water to the affected people
- To take immediate measures for disposal of dead bodies and animal carcass to prevent the outbreak of epidemics.
- To take urgent measures for maintaining law and order
- To take the people to safer places (if necessary)

It is a fact that natural disaster cannot be avoided and prevented, but only by our sincere efforts we can mitigate it through advanced preparedness. Preparedness means development, rehabilitation and restoration on one side and mitigation, rescue, and relief on the other side. Necessity of a plan:- The entire North-eastern region is one of the most multi-hazard prone region in the Asian continent with different areas being prone to different hazards like Earthquake, flood, landslides and cyclonic storms etc. The vulnerability of natural disasters combined with socio¬economic vulnerability of the people living in these states poses a great challenge for the government machinery and underscores the need for a comprehensive plan for disaster preparedness and mitigation. Training and capacity building of the officials dealing with emergency situation would be an important instrument of disaster reduction and recovery. The Govt. of India since the last decade has been actively supporting programs for reduction of vulnerability and risks. UNDP has been a partner of the Government of India in such efforts. Vulnerability reduction and linking with sustainable development efforts has been one of the key approaches of UNDP. Strengthening capacities for disaster risk reduction and sustainable recovery process across the country and bringing together skills and resources for making communities disaster resistant is one of the first steps taken in the long term for achieving reduction in loss of lives and protecting the development gains.

FORMULATION AND PREPARATION OF THE PLAN

The District Disaster Management Authority (DDMA), which is the advisory body, prepares the plan with support from all relevant line department, member of PRI, Community based

Organization, NGO's etc. The District Disaster Management Plan, includes the facts and figures that have been collected from various officials and informal sources with a view to meeting the challenges during any natural disaster. Collection and classification of data are to be updated twice in May and November every year. The plan has been prepared with the following viewpoints

1. Contingency Plan is a continuous process.
2. All are got equal in a crisis situation giving emphasis on special vulnerable groups like economically weaker, sick and ailing, pregnant and lactating mother, old aged etc.
3. During relief measures social auditing ensures transparency.
4. Involvement of women and PRI is a must in the entire process.
5. Mitigation Plan reflecting need base approaches from the grassroots level.
6. Well defined preparedness and Response Plan for the entire district.

DISASTERS IN TINSUKIA DISTRICT

Flood : Tinsukia district is situated in the riverine region and having a proximity to Dihing-Patkai Range. This district has a high amount of rainfall primarily because of the clouds of the monsoon. This leads to very high rainfall in the whole district. Such a heavy rainfall causes largely flash floods,and occasionally erosion etc. The rainfall analysis for the Tinsukia district collected from Mohanbari airport SRRG for the years1983 to 2007 are as follows:-

EARTHQUAKE

The entire Tinsukia district falls under the seismic zone V and so vulnerable in terms of Earthquake, as well as the whole district is on alluvial soil stratum and on the foothills of

ABSTRACT OF NUMBER OF OCCURANCES OF RAINFALL FROM 1983 TO 2007 OF STATED INTENSITIES AND MORE WITH RESPECT TO DURATION

	Intensity of Rainfall (MM/Hour)								
Duration	30+	35+	40+	45+	50+	60+	75+	100+	125+
5 minutes	444	333	260	187	109	64	24	10	3
10 minutes	393	294	213	188	100	64	21	5	0
15 minutes	333	206	160	95	65	63	12	5	1
20 minutes	185	144	102	79	49	27	11	3	0
30 minutes	175	132	99	73	46	24	6	0	0
40 minutes	88	67	81	36	25	13	2	0	0
50 minutes	47	40	32	27	24	15	7	0	0
60 minutes	39	33	22	19	11	6	5	0	0
90 minutes	13	11	8	8	8	3	2	0	0

N.B: Data source from T&CP, Tinsukia on basis of RMC, Guwahati
(Months during which maximum rainfall occurs in June, July, August)

Himalayan range. The major earthquake in 1950 totally changed the physiographic appearance of Sadiya Sub- division and the whole road communication network was

(3) For any early warning report received from North-East Space application Centre (NESAC), Umiam, Meghalaya, the same should be intimated to Executive Engineer,Water Resource, PWD State Roads/Rural Roads and Supdt. of Police, Addl. SP, SDO Civil Sadiya and Margherita and all CircleOfficers.

(4) Circle officers will have village vulnerability map with them so that they can pass message to respective Gaon Buras/ LR Staff and PRI members without fail. Superintendent of Police will accordingly inform Officers- in- Charge of Police Stations and In-Charge of Out Posts. Circle Officers will also keep contact with the representative members of vulnerable villages.

(5) All concerned Departmental Heads, Circle Officers and their Officers,Gaon Buras should keep their mobiles on switch on mode round the clock.

(6) The Water Resource dept. as well as the PWD(State and Rural Roads)should take steps to maintain a strong liaison between their officials and their manpower at he field level and keep the District Administration well informed on any emergency situation that may arise.

(7) Deputy Commissioner will utilize services of SDIPRO for issuing pressure lease forinforming the public on various issues related to Disaster,making people aware about warnings(only in case of emergency. The contact nos. of SDIPRO and DPO(DM) should be circulated to all concerned persons so that they can get the required information in need of the hour.

This protective process embraces measures which enable governments, communities and individuals to respond rapidly to disaster situations to cope with them effectively. Preparedness is also taken through the formulation of viable emergency plans, the development of warning systems, the maintenance of inventories and the training of personnel. It may also embrace search and rescue measures as well as evacuation plans for areas that may be at risk from a recurring disaster. Preparedness therefore encompasses those measures taken before a disaster event which are aimed at minimizing the loss of life, disruption of critical services, and damage when the disaster occurs. All preparedness planning needs to be supported by appropriate legislation with clear allocation of responsibilities and budgetary provisions.

Mitigation embraces all measures taken to reduce both the effect of the hazard itself and the vulnerable conditions to it in order to reduce the scale of a future disaster. Therefore mitigation activities can be focused on the hazard itself or the elements exposed to the threat. Examples of mitigation measures which are hazard specific include modifying the occurrence of the hazard, avoiding the hazard by siting people away from the hazard and by strengthening structures to reduce damage when a hazard occurs. In addition to these physical measures, mitigation aims at reducing the physical, economic and social vulnerability to threats and the underlying causes for this vulnerability.

MAIN MITIGATION STRATEGIES

1. Mapping of the flood prone areas is a primary step involved in reducing the risk of the

Chapter 4

Disaster Management in North-West District, Delhi

Danish Ashraf, IAS

**The topic was selected by me at the time when I was involved in the making of District Disaster Management Plan (DDMP) for my district .i.e. North-West Delhi. AGMUT cadre is a relatively disaster prone cadre. From islands of Andamans / Lakshyadweep to hilly states of Arunachal Pradesh & Mizoram the cadre has variety of disasters which had been experienced earlier also. Yet before completing the plan I was given independent charge of Asst. Commissioner MCD , but still the lessons learnt were very useful. Basically these are personal views and aren't meant to blame anybody. Also I won 't focus only on the plan making aspect of the district. The basic data related to the district has already been sent in "District Over the Years"topic . So, I won 't make a repetition here.*

Disaster Management in India is a very novel concept as the serious steps towards institutionalizing the concept and developing the rational administrative machinery for the management is just less than a decade old. The idea of disaster management took concrete shape only after passing of Disaster Management Act by parliament in the year 2005. The statistics are readily available on internet that how much part of India is prone to which kind of disaster. And we can easily tell that India is alarmingly in a dangerous situation. As a welfare state and a responsible democratic state it's the vital responsibility of government and administrative machinery to provide a safe life for their citizen. Yet the idea is managing the disaster - not only during disaster but before the disaster seems very promising but we do have to develop the machinery after taking cognizance of regional as well as local aspects of cause of disaster. ICS , i.e. Incidence command system must be better for countries like USA but for Indian condition we have to customize this idea according to our needs.

Under the provisions of National Disaster Management Act , 2005 every district have to prepare its own District Disaster Management Plan (DDMP). Being the Responsible Officer of the district the Deputy Commissioner or District Magistrate is the Chairperson of the. District Disaster Management Authority (DDMA) and he/she is the person responsible for drafting & implementing of DDMP. The plan is prepared to help the District administration for effective response during the disaster. North West district is prone to natural as well as man-made disasters. Earthquake, flood are the major Natural Hazard and industrial, chemical, fire, rail/ road accidents etc. are the main man-made disaster of the district.

The Disaster Management plan for North West District includes facts and figures those have been collected from various departments. North West Disaster management Plan is the first

attempt of the district administration and is a comprehensive document which contains various chapters and each chapter has its own importance. The plan consist Hazard & Risk Assessment, Institutional Mechanism, Response Mechanism, Standard Operating Procedure, inventory of Resources etc. Hazard & Risk Assessment is done on the basis of past disaster data & is collected from all departments. It is suggested that the District level officials of different department will carefully go through the plan and if have any suggestions & comments be free to convey the same so that we can include them in the next edition.It is hoped that the plan would provide concrete guidelines towards preparedness and quick response in case of an emergency and help in realizing sustainable Disaster Risk Reduction & mitigate/minimizes the losses in the district in the long run.

But I have experienced many flaws in the making and implementation of this plan. First of all, being a district with multiplicity of agencies (which has been the same case with respect of all districts of Delhi) it is very challenging to collect the data from all the agencies easily. Every agency has its commitments and engagements.

Ironically the DC's are chairperson of the DDMA , but the licensing for any event is the responsibility of Delhi Police whose main duty is to look after law & order of Delhi. In a mega city like Delhi even a small satsanghas accummtates thousands of people, these events and many other establishments and buildings of Delhi are in threat because of blind growth of population due to migration and related problems. Even in its landmark judgement on UphaarCinema Tragedy Case the Supreme Court has given its verdict that the licensing should be given to administrative authorities (i.e. Deputy Commissioner) from police.

Another vital problem with the disaster management in the whole India is that we are not very sensitive to this process. Only during disaster we get active overnight and forget everything when it leaves. Workshops and training programs related to disaster management are seen as time taking and headaches even among some very good officers. While reading the draft DDMP prepared by District Project Officer (DPO) I found that the plan was exactly copied from Panipat District DDMP. Because at many times the word Panipat appears in the plan. That's why a team of enthusiastic officers and volunteers are needed for this assignment. Also, disaster

management isn't focused at school levels. We need to sensitize students right from the primary level schooling. The awareness should be both side.

Not only natural or traditional disasters but new and potential disasters should also be taught. General tendencies found in the plans here in delhi is that they start with disasters like earthquake and flood (mainly in Yamuna catchment area) and end with it. But there are other regular disasters also , like — road accidents, fire accidents, gas cylinder blast, local epidemics (recently we have noticed large number of Dengue cases in Delhi), damage due to seasonal storms, stampede in busy areas/event etc. But they are not seen as serious threat , although they constitute major percentage of deaths in Delhi.

The villages, unauthorised colonies and Jhuggi-Jhopri clusters (JJ Clusters) of Delhi are some of the focal areas which are very prone to disasters and vulnerable areas. These are highly un-regularised areas without broad streets (most of them aren't enough for the way of fire brigade) , sanitation, safe building plan & construction (which are very prone to collapse, fire, electrical disasters etc), clean water, fire resistant structures etc. The plan require to focus on the complete data specifically related to these type of constructions & structures. Building Codes are to be strictly followed within the limits of whole NCR region.

The National Institute of Disaster Management (NIDM) has developed a very comprehensive model framework of DDMP which is to be followed by the district. Yet the whole model framework isn't easy to follow line by line but we can easily extract what is important & what isn't. The plan extensively talks about different role and responsibilities but regular monitoring is very much required for the effectiveness and efficiency. Only directions from upper authorities are followed but Self-initiatives are very low.

The political leadership scenario in Delhi is also very different from other states. Most of the public representatives (MLA or Councillors or MP etc) are interested in other problems. During my attachment with revenue district I observed that disaster management doesn't get attention of public representatives. Recently the Delhi Government has started a disaster preparedness exercise ,DEMEX (Delhi Emergency Management Exercise) , for monitoring the effectiveness of delhi disaster management. Yet the result of the exercise are very innervating but other sources of awareness must be used , such as SHG's , nukkad plays, panchayat meetings , disaster awareness camps, GRC (Gender Resource Centres, created basically in JJ cluster and other vulnerable areas of whole delhi within Bhagidari Scheme of Delhi Government) camps etc.

With a huge population at its disposal even a small event of disaster can lead to death of thousands in delhi. We do have to focus various aspects of disaster management so that every stage of disaster must be well managed. Even we can take road accidents lightly, yet it's a man-made disasters. With this I would like to end critical review part of the Disaster management in North-West Delhi. Now I am going to add what we actually did to propagate awareness camps among citizens of rural Delhi.

Establishing "Disaster Awareness Counter" at Revenue Camps was the brainchild of DC North-West & ADM North-West, The idea coincided with the ongoing DEMEx exercise of Delhi Disaster Management Authority for awareness & preparedness of disaster all over the city. Due to lack of proper awareness & relief infrastructure, village areas are generally unaware of concept like disaster management.

The concept of Disaster management is new to the villages, although the villages are fairly prone to natural as well as man made disasters. In this case awareness plays an important role in disaster management.

As the chairperson of DDMA (District Disaster Management Authority) the DC is empowered to take disaster prevention and mitigation in his/her district. So, this initiative of making people aware how to prevent or face disaster is indeed something to admire.

During its innovative exercise of "Revenue Camps" (the details about these Revenue Camps will be covered in my Administration Assignment) at Kanjhawala this inclusion of "disaster awareness counter" was made & it continued till the end of camp (basically the camps were organised on weekly basis covering a group of villages & the process went for one month covering whole villages) at Kanjhawala sub-division. With the help of district disaster management cell two volunteers were appointed to participate in the revenue camps with their awareness materials. Their awareness material included posters, banners & drawing books. They were required to be present for the whole hours of camp.

Every person coming to avail service at camp, be it children, adult or old were given pamphlets related to disaster prevention. Also these volunteers educated people on the issue of

Disaster Management in Cyclone Nilam - A Case of Tamilnadu

Aneesh Sekhar S, IAS

Chapter 6

Cyclonic Storm Nilam (IMD designation: BOB 02), was the deadliest tropical cyclone to directly affect South India since Cyclone Jal in 2010. Originating from an area of low pressure over the Bay of Bengal on October 28, the system began as a weak depression 550 km (340 mi) northeast of Trincomalee, Sri Lanka. Over the following few days, the depression gradually intensified into a deep depression, and subsequently a Cyclonic Storm by October 30. It made landfall near Mahabalipuram on October 31 as a strong Cyclonic Storm with peak winds of 85 km/h.

The State was fully prepared to meet the consequences of the cyclone by way of preparedness. However the cyclone did not cause major damage as it lost its intensity on hitting the land. It did cause damage in the coastal districts of Tiruvallur, Kancheepuram, Chennai etc. However as a trainee it provided me with a lot of insight and experience on how to prepare for a major disaster and how to organize relief, rescue and rehabilitation measures. The lessons learnt by the State and District Administration during the management of Cyclone Thane which had hit the State last year also proved to be of much help.

The warning was received from the India Meteorological Department (IMD), Chennai that a depression was formed over Southeast and adjoining Southwest Bay of Bengal and that it could intensify and move further towards TamilNadu coast. The Chief Secretary instructed the Collectors to monitor the situation closely and take appropriate precautionary measures. The Area cyclone Warning Centre located in Chennai also sounded the alarm and issued weather warning for fishermen. The State also appointed a senior IAS officer to each of the vulnerable 13 districts to monitor the situation and do the needful.

The preparation for North East Monsoon and cyclone was already in place from October 1St District Control Rooms had started functioning under the direct supervision of PA (General) to the Collector. Control rooms were to send daily reports such as rainfall report, human loss, cattle loss, hut damages, other damages etc to the Commissioner of Revenue Administration. It was later reported that the cyclone was to hit land at Thiruvottriyur in Tiruvallur District. A Control room was setup in Tiruvottriyur and I was put along with Revenue Divisional Officer, Ambattur as nodal officer in the Control Room. This provided for ample scope for learning from observation and actually experiencing the way things work at the time of a disaster or even an impending disaster. The Revenue department was coordinating with all other department to ensure that the district was ready if any untoward incident was to happen. A plan was schemed

by the Monitoring Officer for the District and the District Collector towards securing relief and rehabilitation measures.

There were 35 Kuppams or fishing villages across the coast in the District. Each Kuppam was put under a Village Officer as the Nodal Officer and such two Kuppams were in turn to be supervised by a Revenue Inspector. Cyclone shelters both permanent as well as temporary were arranged and each of them put under the control of a Village Administrative Officer with the Taluk Supply Officer monitoring at the Taluk level. These officers were to make suitable arrangements by coordinating with the Transport depot to secure transport facilities for transporting the victims from the villages concerned to the nearest shelter identified. Arrangements for generators and drinking water facilities were also made at the shelters. The health department in the district was also instructed to be ready for any immediate action.

A major challenge that was faced by the administration was in evacuating the fishermen. Even after repeated requests and announcements the fishermen refused to move citing that the cyclone was not going to be dangerous. At many places the help of the local elected representatives was sought to secure evacuation of people to safe shelters. Another practical difficulty that was faced was towards arranging food for the people in the shelters. The TNTC (Tamil Nadu Treasury Code) 27 provides for release of money in emergency situations with specific limitations to Revenue officials. However it was found that it will also take one day minimum when the disaster won't wait.

The damage caused by the cyclone was not very severe. In Tiruvallur alone it resulted in 3 deaths, damage of 670 huts, and other minor agricultural and infrastructural damage. The damages assessment and relief measures were the next major challenge for the district administration. For this specific teams were formed for every fishing village and damage assessment held the very next day. It was to be seen that even people who had no damages due to the cyclone started demanding for relief assistance and it became a political issue. The political representatives wanted the wishes of fishermen to be fulfilled by giving relief to all huts. However the revenue administration had to take a more prudent stand and convince the people's representatives regarding the negative repercussions of wrongly including people for relief assistance.

It is said that disaster management and elections are two activities wherein all officials work at their peak efficiency and it was there to be seen in the management of Nilam Cyclone.

INTRODUCTION

Thiruvallur is a newly formed district bifurcated from the erstwhile Chengalpattu district in 1997 and is located in the North East part of Tamil Nadu with a total coastline of 80km . The total geographical area of the district is 3, 42,243 hectares (49,803 ha coastal area) with a population of 37,25,697. The district has a mixture of urban and rural characteristics. The main occupation of the District is agriculture and allied activities engaging 47% of the total work

force. The average rainfall of the district is 1104.4mm, of which North East monsoon contributes to the tune of 690mm.

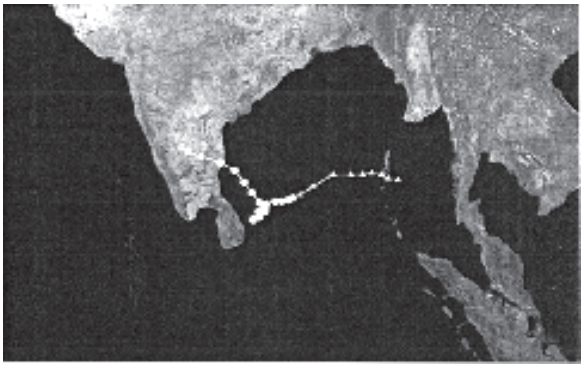
The administrative units of the district consist of both revenue villages and village Panchayat besides town panchayats and municipalities. Thiruvallur district comprises four revenue divisions, 9 Taluks, 14 blocks and 816 villages. Also there are 5 municipalities, 19 town Panchayats and 669 village Panchayats in the district.

Every year the district gets prepared t meet the vagaries of North East monsoon in the form of cyclones and floods. The Eastern coast of the country is more prone to cyclone as compared to the West coast because of increased pressure variation in Bay of Bengal. So the people of the coastal region of the area are well aware and thus adapted to such situations.

Cyclone Thane hit coastal Tamil Nadu in December 2011 with considerable damages though loss of life was minimal. In 2002 a warning was sounded by the IMD by Oct 28 of a depression that had formed over Bay of Bengal which could intensify into a deep depression and move towards coastal Tamil Nadu. By October 30 the depression formed into a cyclone and was named Cyclone Nilam. The cyclone made landfall on October 31 S` by 5pm near to Mahabalipuram causing damages to life and property. The whole of the State administration was put on high alert and the situation carefully monitored and dealt with. Efficient management by the State administration greatly reduced losses to both human lives and property.

N I LAM' - LIFE CYCLE

Cyclonic Storm Nilam (IMD designation: BOB 02) was the deadliest tropical cyclone to directly affect South India since Cyclone Jal in 2010. Originating from an area of low pressure over the Bay of Bengal on October 28, the system began as a weak depression 550 km (340 mi) northeast of Trincomalee, Sri Lanka. Over the following few days, the depression gradually intensified into a deep depression, and subsequently a Cyclonic Storm by October 30. It made landfall near Mahabalipuram on October 31 as a strong Cyclonic Storm with peak winds of 85 km/h (50 mph)



In the early hours of October 27, the India Meteorological Department's Regional Specialized Meteorological Centre in New Delhi started to monitor an area of low pressure, that had developed in south central Bay of Bengal.The next day, the system intensified into a Depression about 550 km (340.mi) to the northeast of Trincomalee, Sri Lanka.

The IMD officially designated it with BOB 02.During that day the depression moved towards the west and gradually developed further with deep convection surrounding the system becoming better organized." The Joint Typhoon Warning Centre also noted that deep convection was building over a cloud-covered low level circulation center and issued a Tropical Cyclone Formation Alert.1121 Early the next day, RSMC New Delhi reported that the depression had intensified into a Deep Depression, before later that day the JTWC started to monitor the system as Tropical Cyclone 02B with wind speeds equivalent to a tropical storm.113I Early on October 30, RSMC New Delhi reported that the system had intensified into a Cyclonic Storm and named it as Nilam while it was located about 100 km (60 mi) to the northeast of Trincomalee in Sri Lanka.

During that day, Nilam moved towards the northwest, while continuing to develop further. Early the next day, the JTWC reported that Nilam had reached its 1-minute peak wind speeds of 100 km/h (60 mph), while RSMC New Delhi reported 3-minute peak sustained wind speeds of 85 km/h (55 mph). Nilam continued to track northwestward under the influence ofa low to mid-level subtropical ridge.1151Later that day the system made landfall on the Indian Coast near Mahabalipuram, before the JTWC issued its final advisory on Nilam as it started to rapidly weaken into a depression over land.061071 in the early hours of November 1, Nilam weakened into a Deep Depression.08 As it moved further inland into the Rayalaseema region of Andhra Pradesh, Nilam further weakened into a Depression.09' The IMD continued tracking Nilam as a weak depression until November 2, when they issued their last warning on the system.

EARLY WARNING SYSTEM

Cyclone warnings are provided by the India Meteorological Department from the Area Cyclone Warning Centres (ACWCs) at Calcutta, Chennai and Mumbai and Cyclone Warning Centres (CWCs) at Vishakhapatnam, Bhubaneswar and Ahmedabad. A constant watch is kept on the Arabian Sea and the Bay of Bengal for the likely genesis of tropical cyclones with the help of satellite imagery, particularly those from the Indian geostationary satellite, INSAT. Data from ships and ocean buoys is also very valuable. When the systems come nearer to the Indian coastline, their subsequent development and movement is monitored by a chain of Cyclone Detection Radars set up by IMD to cover the entire coastal belt. The likely movement of the storms is predicted with the help of track prediction models and by reference to past climatology which has been built up using 125 years of cyclone data.

Cyclone warnings are disseminated through a variety of communication media, such as, radio, television, print media, telephones, fax, telex, telegrams, and police wireless network. A

specially designed Cyclone Warning Dissemination System which works via the INSAT satellite provides area-specific service even when there is a failure of conventional communication channels. Warnings are issued for general public, fishermen, farmers and different categories of users such as central and state government officials responsible for disaster mitigation and relief, industrial and other establishments located in the coastal areas, railways, aviation, communications and power authorities.

The cyclone warnings are issued two stages. The first stage warning known as "Cyclone Alert" is issued 48 hours in advance of the expected commencement of adverse weather over the coastal areas. The second stage warning known as "Cyclone Warning" is issued 24 hours in advance. A ?Pre-cyclone Watch? may be instituted prior to the cyclone alert and a post¬landfall outlook is issued for areas in the interior which may be affected by the cyclone as it continues to move inland and dissipate. Regional Specialized Meteorological Centre NI-IAC, New Delhi, has been designated as the Regional Specialized Meteorological Centre for Tropical Cyclones. It is one of the five such centers recognized by the WMO under a global system for monitoring tropical cyclones. As an international commitment, through the WMO/ESCAP Panel on Tropical Cyclones, tropical cyclone advisories are issued by RSMC, New Delhi to the panel member countries during the tropical cyclones in the Bay of Bengal and the Arabian Sea.

The advisory messages are issue four to eight times a day. The ESCAP Panel countries are Thailand, Myanmar, Bangladesh, Pakistan, Sri Lanka, Maldives and Oman.

Occurrence of Cyclones between 1893 - 2012 in the State of Tamil Nadu

Classification of Cyclone	Number of Cyclones
Very Severe Cyclonic Storm	13
Severe Cyclonic Storm	18
Cyclonic Storm	23
Total	54

PREPAREDNESS

Northeast Monsoon season is the major period of rainfall activity over the State of Tamil Nadu and will be active from the month of October-December, especially in coastal districts. Since this case is associated with heavy to very heavy rainfall in certain areas associated with low pressure formation and cyclonic storms, adequate preparations were taken to prevent loss to life and property in the wake of such an eventuality. The following measures were taken at the District level to tackle the North

District Co-ordination Committee Meeting

Meeting of District Disaster Management Authority and the District Coordination Committee

with the officials of the line departments concerned, Non Governmental Organisations (NGOS), Community Based Organisations (CBOs), Voluntary Organisations and Elected Representatives of Local Bodies were conducted to review the state of preparedness and also to initiate necessary action for the effective response from all concerned for the ensuing Northeast monsoon 2012. The Revenue Divisional Officers, Tahsildars and Block Development Officers were instructed to conduct Coordination Meeting at their divisional, taluk and block level respectively, in an effective manner.

Control Room

A control room / Emergency Operation Centre was started in the Collectorate from 1S` October, equipped with necessary infrastructure facilities viz. STD Telephone, Fax, computer with internet access, etc., and staff was posted round the clock in the Control Room Details of HAM Radio Operators in the district were collected and logged.

Four Digit Toll Free Line 1077

A toll free four digit public utility service telephone No. 1077 with incoming facility alone was installed at the District headquarters for receiving information on disasters. Wide publicity was given in the dailies / media about this facility.

Daily Situation Report Through Intra Site

The District Administration was to send rainfall and other data through the web portal http://revenue.tn.nic.in/ everyday morning. Also reports were to be sent regarding human loss, cattle loss and hut damages at the time of entering rainfall data.

Conduct Of Mock Drill

A mock drill was also conducted in the district regarding the steps that were to be taken in the hour of an eventuality.

Preparation Of Hand Book

The district administration prepared a hand book containing (i) information about the Early

Encroachment in the water courses leads to inundation of areas and particularly low lying areas. Instructions were given to the PWD authorities, to protect the water bodies from encroachments and to evict such encroachments. Obstructions in inlet and outlet channels, if any, were removed.

Stock Of Sand Bags

The Executive Engineers / Superintending Engineers of Public Works Department (Water Resources Department) were to keep adequate quantity of sandbags at strategic places in the district for utilising them whenever necessary. The weak points in tank bunds were identifies and measures taken to strengthen them.

Highways Department

The Highways Department were to keep all types of heavy machineries such as bulldozers, JCBs, power saws and other tree cutting equipments, etc., either available with them or with the registered contractors in good condition for the purpose of clearing the obstructions / road blockades caused by fall of trees, electric poles etc., at the time of cyclone / floods during the Northeast Monsoon period. Instructions were given to the Highways authorities to have a list of Private Contractors involved in construction of bridges, road layers, transport operators, etc., and to utilize their services during emergency. Identification of alternative emergency routes for transportation of people affected by floods were also made.

Instruction were also given to inspect, clean and desilted the culverts. Side berms of main roads were be shaped to allow free flow of water. In areas of likely water logging on road sides, rainwater harvesting pits / soak pits were be constructed.

CIVIL SUPPLIES DEPARTMENT

Collector issued instructions to the Tamil Nadu Civil Supplies Corporation authorities / Cooperative Societies to keep adequate stock of food grains, kerosene and gunny bags. Instructions were given to the respective Senior Regional Managers / Joint Registrars to make available adequate number of lorries in order to move the essential commodities to the appropriate places. Also stock position of essential commodities in the TNCSC godown and fair price shops were verified. Instructions were also issued to all petrol, diesel, LPG retail outlets to keep adequate stocks during the Northeast monsoon period.

RURAL DEVELOPMENT DEPARTMENT

Grama Sabha Meeting was held on 2nd October and management of disasters and proper response to them was taken up as one of the agendas in all areas with special focus on vulnerable areas. The Collector gave necessary instructions to the Block Development Officers for clearing the encroachments, if in the water bodies maintained by the local bodies.

HEALTH DEPARTMENT

Instructions were given to the Deputy Director of Health Services to ensure the availability of adequate storm of medicine well before the onset of northeast monsoon. The Deputy Director, Health was requested to ensure adequate stocks of essential medicine, He was also requested to ensure the good working condition of the infrastructural facilities including generator sets, ambulances and medical pick up vans.

FISHERIES DEPARTMENT

Instructions were given to the Joint Director of Fisheries to have the data base on the availability of catamarans, boats and man power (swimmers) that may be required at the times of emergency.

TAMIL NADU GENERATION AND DISTRIBUTION CORPORATION (TANGEDCO)

In addition to the precautionary measures being adopted by TANGEDCO during flood and cyclone, the Collector instructed the District level officers of TANGEDCO to coordinate with the District administration in tackling the problems arising out of a natural calamity, especially in resumption of electricity supply to the affected areas by stocking adequate number of electric poles, wires, etc.

ANIMAL HUSBANDRY DEPARTMENT

The Assistant Director, Veterinary Services was to ensure the availability of adequate stocks of veterinary medicine in Veterinary Hospitals and to ensure availability of essential drugs viz. antibiotics, drugs such as dextrose, electrolytes and astringents, etc.

The availability of adequate stock of fodder was also to be reviewed. In the event of any emergency, the availability of stocks of fodder identified well in advance before the onset of Northeast monsoon shall be transported to the needy places.

MOTOR VEHICLES MAINTENANCE DEPARTMENT

The Automobile Engineers were to check all the line department vehicles and ensure that the vehicles are in good condition for use at the time of emergency during northeast monsoon period.

COMMUNICATION THROUGH VHF / HF

The coastal districts are provided with two-way communication systems, namely VHF / HF sets for communication. The coastal district revenue officials were instructed to utilize the communication system effectively and extensively during the Northeast Monsoon period. However a major drawback was that the systems were not working and the people were not adequately trained.

Also a list of individuals / organizations that have boats, pump sets, generators, power saw and any other relief and rescue equipments which can be mobilized immediately at the time of

emergency was to be made out.

RELIEF AND RESPONSE

The preparation for North East Monsoon and cyclone was already in place from from October 1S`..District Control Rooms had started functioning under the direct supervision of PA (General) to the Collector. Control rooms were to send daily reports such as rainfall report, human loss, cattle loss, hut damages, other damages etc to the Commissioner of Revenue Administration.

It was later reported that the cyclone was to hit land at Thiruvottriyur in Tiruvallur District. A Control room was setup in Tiruvottriyur and I was put alongwith Revenue Divisional Officer, Ambattur as nodal officer in the Control Room. This provided for ample scope for learning from observation and actually experiencing the way things work at the time of a disaster or even an impending disaster. The Revenue department was coordinating with all other department to ensure that the district was ready for any untoward incident. A plan was schemed by the Monitoring Officer for the District and the District Collector towards securing relief and rehabilitation measures.

There were 35 Kappa's or fishing villages across the coast in the District. Each Kappa was put under a Village Officer as the Nodal Officer and such two Kuppams were in turn to be supervised by a Revenue Inspector. Cyclone shelters both permanent as well as temporary were arranged and each of them put under the control of a Village Administrative Officer with the Taluk Supply Officer monitoring at the Taluk level. A total of 15 evacuation camps were setup in the district. These officers were to make suitable arrangements by coordinating with the Transport depot to secure transport facilities for transporting the victims from the villages concerned to the nearest shelter identified. Arrangements for generators and drinking water facilities were also made at the shelters. The health department in the district was also instructed to be prepared for any immediate action.

Around 1500 people along the coastal belt was shifted to the evacuation camps in the district. A settlement allowance of Rs.1000/- was given to the affected families. Also each of the families were given free Dhoties and Sarees.

A major challenge faced by the administration was in evacuating the fishermen. Even after repeated requests and announcements the fishermen refused to move citing that the cyclone was not going to be dangerous. At many places the help of the local elected representatives was sought to secure evacuation of people to safe shelters. Another practical difficulty that was faced was towards arranging food for the people in the shelters. The TNTC (Tamil Nadu Treasury Code) 27 provides for release of money in emergencysituations with specific limitations to Revenue officials. However it was found that it will also take one day minimum

when the disaster won't wait.

The damage caused by the cyclone was not very severe. In Tiruvallur alone it resulted in 3

deaths, damage of 670 huts, and other minor agricultural and infrastructural damage. The damages assessment and relief measures were the next major challenge for the district administration. For this specific teams were formed for every fishing village and damage assessment held the very next day. It was to be seen that even people who had no damages due to the cyclone started demanding for relief assistance and it became a political issue. The political representatives wanted the wishes of fishermen to be fulfilled by giving relief to all huts. However the revenue administration had to take a more prudent stand and convince the people's representatives regarding the negative repercussions of wrongly including people for relief assistance.

LESSONS LEARNT

- Creation of Taluk level emergency control rooms with required infrastructure and transportation can be highly effective.
- The need for a full fledged SoP at the District Level for disaster management especially with respect to cyclones.
- There still exists confusion as to when exactly to evacuate people and from where the decision is to be taken. This needs to be sorted out.
- Adequate finances should be made available to field staff to make arrangements for shelter, food and to arrange other necessary things during the event of an emergency.
- An inventory of resource materials available needs to maintained and updated regularly.
- The services of voluntary organizations including NGOs, NCC etc can be utilized in Relief measures and also for effective communication with the people
- There should be more importance given to awareness generation and capacity building measures especially to the people living along the coastal belt.
- Special provisions need to be made available for women, children, elderly people and differently abled during emergencies especially in the relief camps.
- The conduct of periodic mock drills and table top exercises can infuse more confidence and fortitude both in the minds of officials and public.
- A periodic updation of State and District Disaster Management Plans based on the lessons learnt on all aspects of disaster management from time to time instead of taking it as a routine academic exercise. There was no concrete material available on how such a situation was dealt with the previous time. This can help concretize the institutional memory.
- Formation of Village level Disaster management teams under the control of Panchayats can be useful in such circumstances.
- Community Based Disaster Risk Management needs to be promoted on a larger scale.

GOOD PRACTICES

- The highlight of the preparedness measures is that there were only very minimal loss of lives, which is an ample testimony to the high octane preparedness in force in the State to face any kind of natural calamity.

- The response was swift and mitigation measures were already in place.
- Timely disbursal of relief to the people.
- Immediate restoration of traffic and communication with the help of local bodies.
- Restoration Power supply to the affected areas in 2 days.
- Co-ordination between different agencies of Government like Revenue Department; Indian Meteorological Department; Rural Development Department; Chennai Corporation; other local bodies.
- The appointment of senior IAS officers as Monitoring Officers in every district which added to the experience capital of the District Administration and boosted the overall morale of the team.
- A dedicated hotline for communications with respect to the cyclone at the Commissioner of Revenue Administration Office

CONCLUSION

Disaster management is one aspect wherein the people expect the administration to deliver effectively. It is one area if managed properly bring great credit or great shame to the administration. The key to managing any disaster is the level of preparedness and timely action. As a trainee I was able to observe from a close vantage point how the administration works itself out in such emergency situations. Cyclone Nilam was managed to near perfection though there still exists some scope for improvement. Such an opportunity has changed the whole perspective to administration and made me think from different angles and perspectives. As it is often quoted problems are there only because they have a solution and who finds it on time is the champion.

Chapter 6

ABOUT THE EDITORS

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Born on 30 September, 1977, pursued his early education at Bareilly. Graduated from IIT Kanpur in Electrical Engineering and worked at C-DoT, Delhi for three years before joining the IAS in 2002. Joined as Sub Collector, Kanhangad in Kasargod district. Served as GM, Kerala Financial Corporation, Deputy Secretary, GAD and Director Kerala State IT Mission before coming to Uttarakhand on inter-cadre deputation. There served as Additional Secretary, Urban Development, Housing and IT. Was instrumental in formulating the policy for small hydropower projects as Additional Secretary, Power. Served as DM Uttarkashi and later DC Alleppey in Kerala. Successfully upgraded the infrastructure of Community Health Centres in Kerala to Indian Public Health Standards (IPHS) and facilitated NABH accredition for General Hospital, Ernakulam, the first of its kind in public sector in Kerala, during stint as Project Director, NRHM, Kerala. Was responsible for key reforms including e-payment of taxes in Commercial Taxes Department of Kerala. His areas of interest include Project Appraisal, Public Finance, Health& Urban Development. Enjoys playing cricket and badminton, gym training and listening to music. Joined LBSNAA as Deputy Director on 2.09.2013. & presently also serving as Director, Centre for Disaster Management.

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Did Ph.D on "Seismotectonic and Earthquake Hazard Assessment in parts of East and North-East India" from Indian Institute of Technology, Kharagpur and Vidyasagar University, INDIA. Joined Centre for Disaster Management, LBSNAA in 2006. Visited Emergency Management Institute (EMI), Maryland; Washington State Emergency Operation Centre (EOC), Pennsylvania EOC, University of Colorado, California Governor's Office Emergency Operation Centre etc. under faculty exchange programme through Ministry of Home Affairs, INDIA to United States of America (USA). Dr. Pal having 11 years of experience on research and training activities primarily focused on the Disaster Governance, Risk Management, Hazard Assessment, GIS Applications, HAM Radio etc. Apart from doing research on the Emergency Risk Management, he is also National level resource person for Incident Command System (ICS)

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Chapter 7

He is a Research Associate at Centre for Disaster Management, LBSNAA, Mussoorie. He did masters in Risk and Emergency Management from Understanding and Managing Extremes Graduate School, IUSS, Pavia, Italy and another Masters in Disaster Mitigation from IIEE, India and also completed PG Diploma in GIS and RS from CDAC, NOIDA, Government of India (GoI). Besides, he has completed Diploma in Computer Applications from DOEACC, GoI. He awarded full scholarship from Institute for Advance Study of Pavia- IUSS, Italy and also visiting scholar in University of Dhaka, Disaster Management Centre and attended a number of workshops and conferences on the Disaster Management in India as well as overseas. His area of interests are Disaster Risk Management and Climate Change adaptation planning, Contingency/Emergency planning, ICT for Disaster Management including Geographic Information System (GIS)/ Remote Sensing and Database Management system, HAM radio in disaster and incident management, Participatory Learning & Action (PLA), Social Vulnerability and Urban risksmanagement.