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# **Disaster Governance in India**

**Series-1**



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# 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 needing 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 Samarajan area, 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 but the areas likely to be affected are shown as 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 grassroots 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. Each zone will be headed by a Zonal officer who is the overall in charge. The zonal officer is assisted by the Sector officers/Assistants/Volunteers who in update and inform him from time to time for proper networking .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, Dhakuakhana 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.30 no of villages have been identified within this zone.This zone is moderately affected by flood. .Sri Homen Handique (9435278715) 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. 32 nos of villages have identified within this zone.as highly flood prone. Sri NandesarDutta ,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. 30 no of villages have been identified under this zone.. Sri Debiram Chunkrang (9435277592) 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 flood prone and due to its topography and geographical location numerous tributaries flow out of Arunachal Pradesh towards Dhemaji which 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 a 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 (9954157332) LM, will be in charge of this zone and he will be assisted by the following Lot Mondols-Parsmani Bora, RatulGogoi, GolapBorpatraGohain, HemchandraGohain, AjitPhukan, TapanHandique, DebeswarChetia, LalitGogoi, RajenGogoi, 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 (9435419142) 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 (9859166100) LM will be in charge of this zone. and will be assisted by Sri Khageswar Das LM, Ramen Buragohain LM, DebeswarChetia LM Dilip Bhuyan LM and all Gaonburhas of the villages Sisiborgaon revenue circle is located in the middle of Dhemaji District 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, Jiadhah, 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 Sissiborgaon Tokowbari, Bhebeli, Kerokani Majgaon, 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 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 Jiadhah 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 tablets and 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 who are actively involved in various activities under DDMA (District Disaster management authority) They have their volunteers who are 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 Sissiborgaon 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. Its because of prompt and timely intervention of the authority that many lives were saved.

Disaster Management is a grey area which needs more and 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.

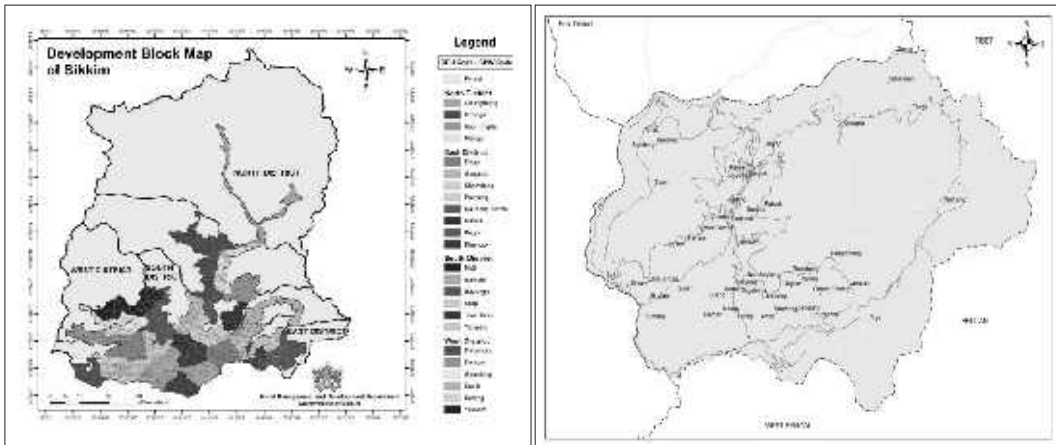
Figure 1: Location of Sikkim in Map of India



## 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



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**

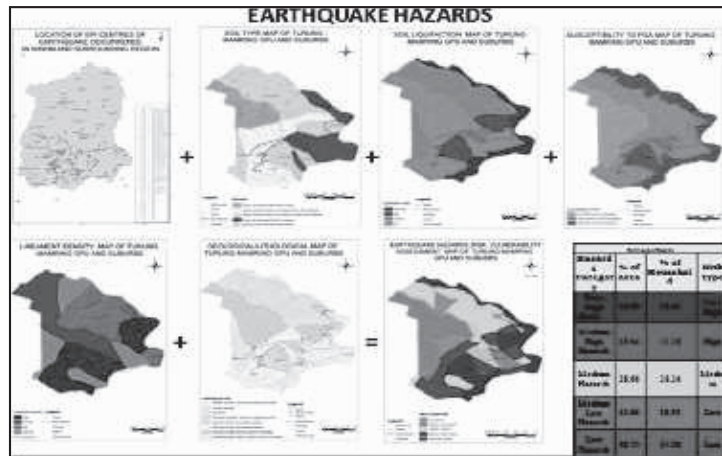
MHRVA (Multi Hazards Risk Vulnerability Assessment ) are being undertaken where the following hazards are considered for Sikkim as mountainous state as per IS codes and other requisite data from the field, which is required for Multi Hazards Risk Vulnerability Assessment Study in the Himalayan Region.

- 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.

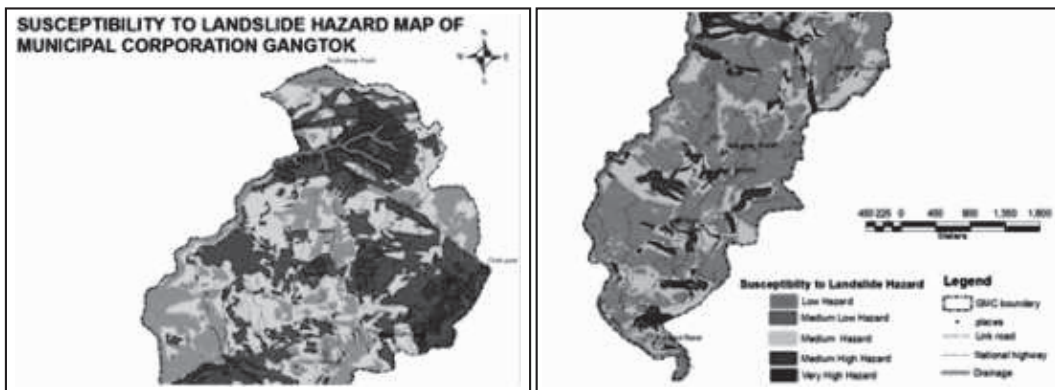
- a) Hazards areas identified in terms of its intensity and scale.
- b) Risk Level is identified up to household levels.
- c) Vulnerable areas are identified.

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 state 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 there are three ways to build in DM concerns:

All new projects/programmes should be revisited to build in DM resilience with regard to disasters.

The building byelaws 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:

- Village head
- Opinion leaders
- PRI member

AWW, ANM and other village level workers

- School Teachers
- Women group leaders
- Community based organisations especially Youth club members, SHG members etc.

### **DEVELOPMENT OF VILLAGE DISASTER MANAGEMENT PLAN**

The process of CBDM Preparedness approach is done by zoning of vulnerable areas, building network among the CBOs / NGOs, involving Gram Panchayat, training of DMC/Volunteers/ PRIs/ CBOs on disaster management and implementation strategy, facilitating the implementation process by CBOs/ GP/ DMC, Fixing a meeting in the GP for review of the Programme. A CBDM Plan needs to be prepared. For the plan, identification of volunteers from each village is required and the selected volunteers are to be trained for Community Contingency Plan (CCP) developments at village level.

### **FORMATION OF TASK FORCE AT VILLAGE**

The possible village volunteers taskforce members are:

- Motivated & active Men/Women
- Ex-service Men/NCC/NSS/Swimmers
- Gram Rakhi / Chowkidar
- Anganwadi Workers /ANM
- School Teachers
- Youth Club Members/ Self Help group/Farmer group/Any other groups

### **CIVIL DEFENCE**

Sikkim has one combined central training institutes (Civil defence and Home Guards Combined) at home guards Office Development Area, Gangtok. A proposal for setting and establishment of civil defence school in Sikkim is under pipeline in the Government of India. The Civil Defence set up can play a major role in assisting the District Disaster Management Authority, (DDMA) with the help of its volunteers at grass roots level, in different phases of disaster, particularly in pre- disaster (public awareness, community capacity building and

community preparedness) and mid-disaster phases (response and relief).

### HOME GUARDS

Home Guards are a standby force, to assist the police in controlling civil disturbance and communal riots. Subsequently, the concept of Home Guards was adopted by several States. The role of Home Guards is to serve as an auxiliary to the police in maintenance of internal security, help the community in any kind of emergency such as an earthquake, landslide, fire, epidemic etc., help in maintenance of essential services, promote communal harmony and assist the administration in protecting weaker sections, participate in socio-economic and welfare activities and perform Civil Defense duties.

### NCC, NSS, NYK

The cadres of NCC/NSS are essentially voluntary comprising school and college students. In other words, the NCC/NSS/NYKS cadres will be given appropriately designed modules on Disaster Management in order to train them and equip them suitably for assisting in Disaster Management efforts as responsible citizens. In order to achieve this preparedness measure, the following measures will be undertaken.

### STATE DISASTER RESPONSE FORCE

State of Sikkim is in process of creating SDRF comprising of 130 members. They will be trained in Search and Rescue and First Aid. After availing the training they will be Trainers of Trainers (TOT's). During normal time SDRF will impart training and create cadre of volunteers who will be volunteering during disaster period and during disasters they will be actively involved in Search and Rescue and First Aid.

## RESPONSE

### 1. Incident Command System

The Incident commander (IC) has the overall responsibility for the management of onsite response to any incident. The IC is appointed by the Responsible Officer (RO). The IC appointed for Sikkim is the District Collectorate (DC) or any person appointed by DC. He may have a deputy with him depending upon the magnitude and nature of the incident. District Collectorate can appoint Additional District Collectorate of any person suitable as the Deputy Incident Commander. Two sets of staff are also appointed for IC's support and assistance:

#### (a) Command Staff (b) General Staff

##### a) Command Staff:

Command staff comprises of IC/ Relief Commissioner, Deputy Commandant/DC, Information & Media Officer (IMO), Safety Officer (SO) and the Liaison Officer (LO).

#### Roles and Responsibilities of IC

##### The IC will:

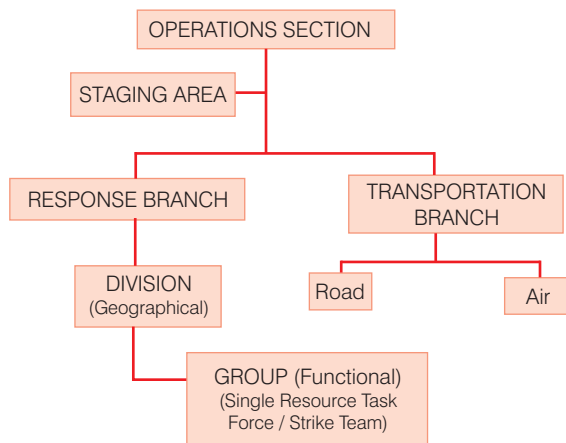
- I. Obtain information on:
  - (a) Situation status like number of people and the area affected etc.
  - (b) Availability and procurement of resources.
  - (c) Requirement of facilities like ICP, Staging Area, Incident Base, Camp, Relief Camp, etc.
  - (d) Availability and requirements of Communication System.
  - (e) Future weather 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).

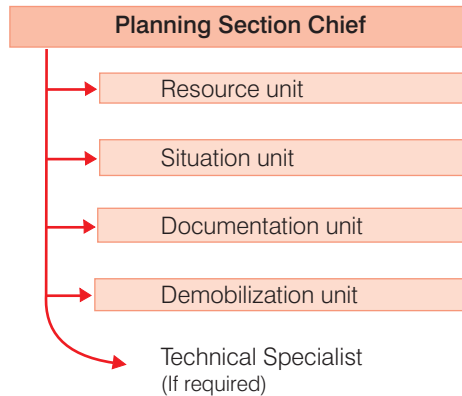
**OPERATIONS SECTION (OS) :**

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)**

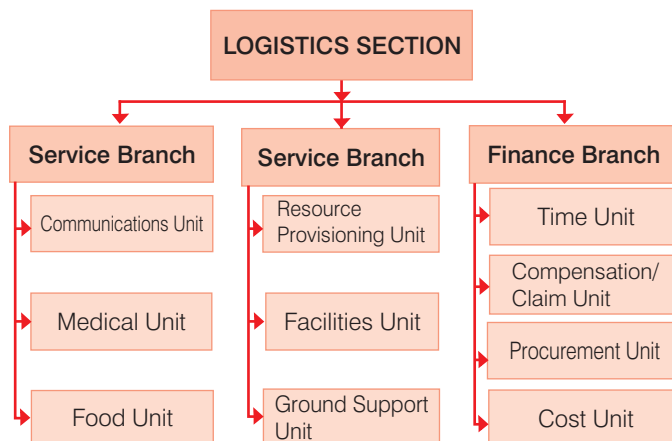
Planning Section comprises of Resource Unit, Situation Unit, Documentation Unit and Demobilisation Unit. A chief known as Planning Section Chief heads the Section. The PSC is responsible for collection, evaluation, dissemination and use of information. It keeps track of the developing scenario and status 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 and other agencies. It would require a proper and smooth coordination at the highest level of the administration. The LS will work closely with the RO, EOC and the IC.

A chief known as the Logistics Section Chief (LSC) heads LS. The LS comprises of Service, Support and Finance Branches.



## 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 business of the District Authority;
- (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 management at Center, state and district level by forming NDMA, SDMA and DDMA. 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 Tibetan 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 Division 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 response. A suitable space was identified in the DC Office to set up EOC. All the structuring work was done and EOC was made equipped for base wireless communication station and internet based decision support system. Detailed maps showing routes, vulnerable areas were made available at EOC. Detailed men and resource inventory of each department along with department specific Standard Operating Procedures (SOPs) were also made available at EOC. District disaster management plan was revised by incorporating features of Incident Response System (IRS) and was also made available at EOC. Hotline connections were made with control rooms at Municipal Corporation office, fire station and police control room so that there is uninterrupted relay of messages. A disaster helpline with number 1077 was also started, on which anyone can report an incident of disaster/accident. Phone and wireless operators have been deputed at EOC in 3 shifts of 8 hours each so that helpline is open 24X7. The idea was to fully equip EOC so that these resources aid in quick decision making at the time of disasters. Similarly a temporary EOC was made at Kalka sub-division. Today EOC made at Panchkula is one of the best equipped EOCs in whole India and is adequately equipped to handle disaster situations.

## SENSITIZATION WORKSHOP ON EARTHQUAKE RISK MANAGEMENT

A one day sensitization workshop on earthquake risk management was organized by NDMA in Panchkula. The workshop was conducted by earthquake engineering experts from IIT Madras and National Geophysical research Institute, Hyderabad. The workshop was divided into 2 sessions – first for school and college students, which was meant for awareness generation, second for government officials and residents, which was a technical session related to earthquake safety of built environment. These sessions were highly interactive and saw presence of more than 2500 participants from all categories. Issues related to earthquake safety were discussed in detail and changes were suggested in architecture and building laws to make them suitable to demands of earthquake resistance.

Conducting this workshop involved tasks like taking care of travel and lodging of experts, arrangement of venue for conducting workshop with audio-video facilities, lunch arrangement for 2500 participants, communication with schools, colleges, government departments and resident welfare associations etc.

## RAPID VISUAL SCREENING (RVS)

### Need for RVS

Panchkula being located next to Chandigarh has become an important city for Haryana as many critical and important office buildings have come up here eg. State police headquarter, regional headquarters of many Center/State boards and corporations, directorate level offices of all departments etc. Thus Panchkula has got many critical buildings and life-line structures.

Owing to location of the city in zone-IV of seismic zones, there is an urgent need to check the earthquake resistance capacity of these important buildings as these buildings have high density occupancy during office hours and are critical to the post-disaster response of government across the state in event of any disaster.

Thus as a preparatory exercise of mega mock drill we started identifying critical and life-line structures in Panchkula. Important buildings like government offices, DC office and DC residence, fire stations, police stations, judicial court complex, hospitals, schools, railway station, auditoriums, movie theatres, bridges, power stations, water tanks etc. were identified for conducting a check-up exercise called Rapid Visual Screening (RVS) to ascertain the earthquake resistance capacity of these buildings.

RVS is a system to evaluate seismic vulnerability of buildings without performing any structural calculations. It permits vulnerability assessment based on walk-around of the building by a trained evaluator. Results obtained by RVA can serve many purposes like to identify if a particular building requires further evaluation for assessment of its seismic vulnerability, to identify simple requirements of retrofitting and to assess the seismic damageability (structural vulnerability) of the building and seismic rehabilitation needs.

### PROBLEMS FACED DURING RVS

But a problem in the form of lack of expertise in engineers in district in conducting RVS came up. Thus on the initiative of National Institute of Disaster Management (NIDM) state decided to send its PWD engineers from each district to attend a short course in RVS. From Panchkula a team led by Executive Engineer PWD attended the training and they were given a task of conducting RVS of 10 identified critical structures in initial phase before mega mock drill. But owing to other official obligations of PWD engineers and lack of interest in RVS exercise, this suffered and we had a hard time to get the RVS done for 10 identified buildings. These RVS exercises were then cross checked by earthquake engineering experts and some errors were rectified. The idea was to get RVS done for all important structures after mega mock drill but nothing has moved after the drill due to apathy of PWD engineers. It is due to a basic problem with government officials that we do not take training seriously and we do not act unless we are stuck with an emergency like situation. RVS is a peace time exercise, results of which would enhance earthquake resistance capacity of existing structures and thus would reduce damage to life in times of disasters. There is need to give publicity to RVS and conduct regular training for PWD engineers. For skill enhancement of engineers to conduct RVS and widen coverage of RVS done structures, NDMA should start a mission-mode project in all Zone V, IV and III areas so that critical life-line buildings in these regions are covered by RVS.

### MEDIA PLAN

Conducting mega mock drill also included a component of awareness generation among masses. For creating mass awareness among public regarding the danger which Panchkula



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 administrators as the whole rationale of self-assessment and awareness generation by these exercises fails due to lopsided coverage by media.

### **EARTHQUAKE AND FIRE MOCK DRILLS IN SCHOOLS/EDUCATIONAL INSTITUTIONS**

Schools and other educational institutions are most vulnerable structures when it comes to earthquake or fire hazards due to presence of high density of children in these buildings which are one of the most vulnerable sections affected by these disasters. Due to Bhuj earthquake in 2001, around 1000 school children lost their lives and around 2000 school buildings collapsed completely. This damage of lives could have been reduced if school children had practiced earthquake mitigation drills in schools. Thus there is a need to integrate disaster mock drills with school curriculum on pattern of Japan. There is also a need to formulate school mock drill programmes in the states so that it can be uniformly adopted by all schools.

Conducting mock drills involves a clear demarcation of roles and duties of each staff. Alarm systems needs to be put in place and tested regularly. Disaster specific Standard Operating Procedure (SOPs) and emergency evacuation plan needs to be formulated. Mock drills train staff and children to respond to disasters with courage and test efficacy of school disaster response plans. Pre-announced mock drills should be conducted initially in order to formulate a sound evacuation plan in times of disasters and assign roles to various stakeholders. Once proficiency has been achieved by staff and students, then surprise unannounced drill can be conducted to test the preparations.

First thing which needs to installed in schools is an alarm system which is fail-proof and is easily recognizable. Then an emergency evacuation plan should be developed specific to type of disasters, showing all the exit routes and safe evacuation areas. All exits should be clearly demarcated by glowing sign boards. Fire extinguishers should be placed at adequate places and students and staffs should be trained to operate them. For assisting students with disabilities, a buddy system needs to be adopted in which another student is given responsibility of assisting a disable student.

In case of earthquake mock drills, students should be given practice of 'duck, cover, hold' to save themselves from falling objects and in case of fire mock-drill, students should be taught to 'stop,drop,roll' if someone catches fire. Students can be given training of basic medical first aid and CPR. To properly activate the school disaster management plan, following teams comprising of staff, parents and students can be formed by training them in specific tasks – School Fire Management Committee, Awareness campaign team, fire alarming team, evacuation team, search and rescue team, first aid team, transport management team etc.

On conducting surveys of schools in district it was found that most of the schools had no emergency evacuation plans. In many of them fire extinguishers were either missing or had

expired. Many government schools had buildings in bad shape which was posing danger to students studying in them. Thus we started a programme in which fire-fighting equipments were installed in schools and emergency evacuation plans were formulated. Process of formation of school disaster management teams is underway and many schools have formed these teams already. A yearly mock drill calendar is also under preparation and soon it would be integrated with school curriculum. Dilapidated school buildings have been surveyed and repair work has started. As part of preparations for mega mock drill, we had conducted mock drill demonstrations in many schools with the help of district education officer, civil defense personnel, NDRF and district training instructor in which students were made aware about importance of 'duck, cover, hold' exercise and evacuation methods.

### COMMUNICATION SYSTEM DURING DISASTER

Communication systems serve as critical lifelines during any disaster. It is often observed that disasters like fire, earthquake, floods etc. disrupt traditional communication channels. It has also been experienced that mobile based communication systems also become jammed due to damage of mobile towers and over-congestion of network. Thus mobile based system cannot be relied in times of disasters like floods and earthquakes. In absence of any means of communication, administration is not able to gauge the extent of damage in affected areas and is also not able to deploy necessary resources to disaster sites.

Thus there is a need of having a robust system of communication in the district which can be easily switched on in times of emergency. Some of these systems include wireless sets, satellite phones, ham radio etc. On checking availability of these systems, it was found that neither satellite phones and ham radios were available in the district nor there was any trained manpower to operate them. A vehicle mounted with HF and VHF frequency repeaters was also not available thus restricting wireless communication to limited area. Thus we opted for wireless sets which were commonly used by police for communication. Around 50 wireless sets were procured by district administration and were allotted to all the key stakeholders. A dedicated channel frequency was set for communication with base station at EOC. All the wireless set operators were assigned call signs for contacting EOC. During mega mock drill it was assumed that all other means of communication had failed and all stakeholders were supposed to contact EOC using only wireless sets. This gave a hands-on experience to district officials of operating wireless sets and thus preparing them for using similar systems in times of disaster.

Dedicated hotline was also connected between EOC, fire station, Municipal corporation office and Police Control Room for uninterrupted flow of information.

### PREPARATION OF RESOURCE INVENTORY AND MAPPING

Human and material resources are critical assets when it comes to responding to disasters effectively. Quick availability of these man and material resources in adequate quantity can

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 only revenue officials are concerned with it.

### **FORMATION OF INCIDENT RESPONSE TEAMS (IRTS)**

As a prerequisite for conducting mega mock drill, Incident Response Teams (IRTs) needed to be constituted for each incident site. As per the guidelines of Incident Response System (IRS), IRTs should be formed and deputed at each incident site under an overall in-charge called Site Commander. These teams should include medical team, search and rescue (SAR) and fire team, police team and other teams like water and electricity team. Thus for 15 identified incident sites 15 senior gazetted officers were made Site Commanders. They had the overall responsibility of handling disaster situation at site allotted to them. To assist them in cordoning off the area and manage traffic situation, a Police team comprising of around 20 personnel was instructed to report to Site Commanders. For providing medical first aid and transferring injured to hospitals, a medical team of 5-6 staff led by doctors was also asked to reach the incident site immediately and report to the Site Commander. For fire-fighting and search & rescue of injured/trapped persons, teams of fire brigade and civil defence & home guards comprising around 20 personnel were also instructed to report to Site Commanders and take information from them about the extent of damage. Similarly water supply and electricity teams were deployed at each site to look after needs of drinking water and cut off electricity when operation is on. Similar IRTs were also deployed at Relief camps so that evacuated persons do not face any problem regarding medical aid, food and water, clothing, security etc. Few IRTs were also kept as reserved to be deployed in times of need of extra support at sites.

At the EOC, base teams were also formed so that they can control the response operation from centralized place. Overall in-charge of whole response was called Responsible Officer and DC Panchkula was given this responsibility. SDM was made the Incident Commander and was responsible for direct control of response operation. A senior administrative officer was made EOC in-charge. Tehsildar was deployed as Liaison Officer. District PRO was made Media and Information Officer. DCP was given responsibility as Safety Officer. 3 senior administrative officers were made incharge of 3 zones comprising 5 sites each. As per IRS, a Planning section was also constituted and DC was made its head. Its members included nodal officers of all line departments in district. SDM was made Operations Sections Chief and had the responsibility of all search and rescue operation. Logistic section was constituted and included officers from transport department and traffic police. Procurement and finance section headed by DC had members like food & supply officer, treasury officer, district nazir, accountants etc.

### **REVISION OF DISTRICT DISASTER MANAGEMENT PLAN AND SOPS FOR DEPARTMENTS**

As per the provisions of Disaster Management Act 2005, each district is supposed to have its own disaster management plan. Panchkula had its disaster management plan formulated in

2008 but it had become obsolete and redundant over the time. During these years many new developments had taken place and new concepts in disaster management had been introduced. Latest regime in disaster management is based on Incident Response System (IRS) in which specific roles are defined minutely to the last level. IRS is a widely accepted and tested regime through the world which is flexible and can be adapted to suite any level of disaster.

As a part of preparations for mega mock drill, we started revising the district disaster management plan. Earlier plan did not integrate the concept of IRS into it. Hazard profiling of the district was also lacking details. District faces major hazards like landslide, floods and earthquake owing to its location at foothills of Himalayas but no study was done to locate the places facing danger from these hazards. Resource inventory list was made superficially and was outdated. Flood control mechanism was just a mere repetition of flood control orders issued by government from time to time.

Thus we introduced the concept of IRS into the plan and allocated duties of officers at various levels. Human and material resource inventory was revised and included in the plan. We did hazard profiling of whole district with respect to landslide, flood and earthquake. Vulnerable regions were identified and decentralized resources have been placed at nearby areas so that response can start as soon as possible in times of emergency. We also did both day and night occupancy profiling and mapping of important public places. It was found that government offices, schools, religious places, industrial areas, hospitals, colleges etc. have high occupancy during day times and if earthquake strikes at daytime then rescue efforts should be concentrated more towards these places. Similarly during night residential areas, guesthouses, old age homes etc. have high occupancy and rescue efforts need to be focused to these regions. Panchkula sees a problem of landslide every year after rains as topography of this region is very unstable as base of hills is a mixture of just soil and pebbles. After every rain, water seeps into the base of these hills and make them unstable and prone to landslides. This causes damage to lots of houses built up on hilly slopes. Thus to map the regions prone to landslides, a team has been called from Geological Survey of India, Lucknow to study the geology of these hills and suggest measures to mitigate the effects of landslides. Floods are also a natural hazard in the district. Owing to location of district at foothills of Himalayas, a large number of rivulets and torrents flow across the region. These run dry in summers and carry large volumes of water during monsoons. Flash floods are thus caused due to rains in upper reaches of their catchment areas and cause damage to lives and property of people residing along these rivulets. Thus we started an exercise of identifying flood prone regions so that flood protection schemes can be implemented before the onset of monsoon. Now all the identified flood protection schemes have been sanctioned and expected to be completed by end of June. One irregularity which we had observed that no proper data was being maintained 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 a narrow street. Lack of adequate space and design of the building was also making swift movement of fire-tenders difficult. Thus we had proposed to alter the design of building and remove unauthorized constructions around the fire station to widen up the street linking it to main road, so that time lost in movement of fire-tenders can be reduced. We had also proposed to open one more fire station at Barwala, which would serve the rural areas of the district. This station would also serve the industrial estate located nearby along with the area of Panchkula Extension urban estate which is being planned to be developed in near future.

### **Equipment**

On audit of fire-fighting equipments at fire stations, we came to conclusion that Panchkula had no hydraulic platform or turn-table to deal with fire incidents in high rise buildings. Infact it was learnt that there is only 1 hydraulic platform ladder in state of Haryana in Gurgaon. This was putting lives of people residing in multi-storey buildings in peril as fire stations were not equipped to deal with fires in these buildings. Similarly there were other fire apparatus which were not available like fire-fighting suits, breathing equipment, foam tender, hazmat vehicle, cutting tools, rescue tender etc. Owing to financial restrictions, we had ordered hydraulic platform ladder on 1st priority basis due to its urgent need and demand for other equipments followed. When new stations will be opened, there will be additional need of more fire-fighting equipments.

### **Man-Power**

On audit of man-power available for fire-fighting in Panchkula, it was found that fire stations were heavily under-staffed. Out of 36 posts of fire-man, only 17 were actually posted. Similarly were many unfilled posts of leading fire-man and drivers. With the proposal to upgrade the existing fire stations and construct new fire-stations, it was found that there was total shortage of around 70 staff of all categories. Thus we started process of recruitment of fire-fighting staff through contractual system as it is a quicker means of recruitment. Before the mega mock drill we had recruited around 25 fire-fighting staff which has eased the pressure on existing fire-fighting system.

### **Police Deployment**

Incident Response System (IRS) as a response to any disaster envisages multiple critical roles for local police forces. Police is generally the first responders at sites of accidents and disasters. Police department with its trained and fit man-power can act as a useful resource in times of emergency and disasters. Police has to play important roles like managing traffic movement so that rescue teams and relief material can reach incident sites quickly, maintain law and order at incident sites by cordoning off the sites and preventing rioting, managing VIP visits during disasters and assisting in search and rescue of victims of disasters. IRS has also given importance to police by assigning specific duties. Superintendent of Police (SP) has to



play an important role as District Safety Officer in which he/she has to supervise and control the deployment of police force in aid to civil authorities at disaster sites.

For mega mock drill police had the responsibility of managing traffic at sites, cordoning off the area to avoid accidents during rescue exercise, suggest alternative routes for deployment of rescue vehicles and ambulances and managing wireless communications. As mega mock drill was conducted at 15 sites and 2 relief camp sites across the city, these sites were divided into 3 zones of 5 sites each. A DSP level officer was made area in-charge of each zone. Every site had an Inspector/SI level officer appointed as Safety Officer who was heading a team of 20 personnel including women constables. For traffic management 4-5 constables were stationed at each site along with a PCR vehicle. At each zone a crane was also deployed to shift vehicles parked on the way so that movement of rescue and medical aid vehicles can be swift. For doing mock panchnama of dead victims under 174 CrPCat designated hospitals, a dedicated team of investigating officers was also stationed. Additionally 3 teams of reserved police force were also kept ready with anti-riot gear at all the 3 zones to manage any law and order situation. A dedicated DSP rank officer was assigned responsibility to manage smooth flow of traffic in all the 3 zones. Police had also deployed an official Public Relations Officer (PRO) for giving information to press/electronic media. In total around 520 gazetted and non-gazetted police officials participated in the mock drill under the overall supervision of Deputy Commissioner of Police (DCP). A detailed route chart was made for each site showing alternative routes which vehicles can take if original route is blocked or damaged. This contingency planning helps when routes are damaged due to earthquake or landslides.

During mega mock drill, many findings were reported. Police officials were not trained properly to cordon off the area so that rescue exercise goes on without any accident. Due to failure of police to manage traffic and cordon off the area properly in first ever mock drill conducted by NDMA in 2007 in Gurgaon, a mock victim had to lose his life as fire tender crushed him accidentally. It is a general experience that at the sites of accidents or disasters, bystanders stop to see the rescue operation, which causes hindrance to flow of resources to sites and at the same time endangers their lives as well. In disasters there are generally visits by VIPs to oversee the operations, these put extra burden on administration as their security also has to be managed by police. In times of disaster rioting and mass stealing of shops and relief material also happens sometimes, thus police also to maintain law and order in the district. To maintain law and order at incident sites and relief camps, duty magistrates were also deployed from civil administration. During mega mock drill it was found that police is ill-equipped in terms of detailed route maps, anti-rioting gear and rescue training. A need was felt to train a specialized team of police personnel in police lines of each district for disaster management duties. This teams if raised could act as quick response teams (QRT) and can perform all the disaster related duties skillfully. Besides NDMA is incentivizing states to raise a specialized 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 casualties 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

search and rescue exercises. These forces consist of people who volunteer to work for them and in return they are paid honorarium for their services.

As part of preparation for mega mock drill, we checked the human and material resources of civil defence in district. It was found that they lacked essential equipments to be used in search and rescue operations and their personnel were also out of practice. Thus we devised a practice plan for civil defence personnel at the sites identified for mock drill under the command of Civil Defence Inspector. Audit of their resources was also done and additional equipment was requisitioned from nearby districts. Resources needed to be procured were also procured under financial restraints. Arrangements of lodging, fuel and food were also done for the civil defence personnel who came for exercise from across the state.

During mega mock drill, teams of civil defence were allocated to all 15 sites and 2 relief camps. They were asked to be ready to respond to calls coming from sites and reach there quickly. Upon reaching at site they were asked to report to Site Commander and start SAR operation upon taking inputs from Site Commander. Civil defence was given task to rescue victims using different methods based on type of situation given.

**District Red Cross** was given the responsibility of managing 2 relief sites. They had to arrange for setting up relief camps, adequate number of blankets, ration and lighting arrangements. Red cross was also responsible for suitable distribution of relief material among evacuated victims.

**District Food and Supply Department** was responsible for supply of food grains, ready to eat ration and fuel supply.

**Public Health Department** was looking after water supply, sanitation and toilets at both incident sites and relief camps.

**Electricity Department** was asked to arrange for emergency lights and inflatable lighting towers at incident sites. They also had to arrange for generators at lifeline buildings and cut power supply during SAR operation so that there is no incident of electrocution or fire due to short circuit.

**PWD Department** was asked to supply building plans of all incident sites and lifeline buildings so that SAR operation team knows the built up environment of the incident site. They had to also arrange for JCB machines and manual workers to deal with any situation of debris removal.

### **MANAGING INTERACTION WITH NDRF, NDMA AND ARMY**

Multi-state Mega mock drill involved a close co-ordination with agencies like NDMA, NDRF, Army observers and governments of Punjab, Chandigarh and Himachal Pradesh. Thus Deputy Commissioner had deputed me and SDM as the nodal officers for conducting mega mock drill. Assistant Superintendent Revenue was given responsibility of taking care of all

written and telephonic communications with central agencies and district departments. Appointing nodal officers helps in situations where stakeholders are multiple and are located at different places.

Meetings with NDMA started 6 months ahead of mega mock drill. Some meetings were organized at NDMA headquarter in Delhi and some in Chandigarh. Nodal officers were made responsible for making sure that decisions taken in these meetings are communicated to concerned officials and they are also complied with. Nodal officers also looked after the itinerary, travel and accommodation of NDMA members and resource persons visiting district prior to mock drill. For this Tehsildar was appointed as full time liaison officer with NDMA officials.

Few days prior to mock drill, a team from 8thBn of NDRF at Ghaziabad reported in the district for capacity development of existing forces and to familiarize themselves with the disaster sites. Arrangements had to be done for stay, fuel and food of 50 NDRF personnel in the district. NDRF displayed their skills and equipment during awareness drill organized for resident welfare associations, civil society organisations and educational institutions. Few times due to lack of co-ordination and clash of egos between NDRF and civil defence, tense situations had developed, which were resolved by intervention of Nodal officers.

Army observers were also deployed as independent observers on day of mock drill to evaluate the whole exercise. Armed forces work in their style of operation and sometimes do not understand the restraints faced by civil administration owing to the different types of large number of people we deal with. So dealing with Army becomes tough unless they are handled efficiently.

### **POST MOCK DRILL REPORTING**

Mock drill needs to be analysed after it is over as the findings of the drill can help in plugging the critical holes in the preparedness. At the same time when mock drills help in awareness generation, they also help in checking the effectiveness of response in disaster situations.

Thus post drill reporting is crucial as it helps in sharing experiences with others and also gives an opportunity to stakeholders to give their views and suggestions for betterment of response. Reporting has to be specific and should detail the findings clearly. Post mock drill report to be sent to NDMA and Disaster Management Department included the total number of participants involved in the drill, location of sites, finances resources used, number of victims/injured rescued, categorization of victims based on triage done, names of hospitals to which victims were sent, number of victims sent to relief camps and timings of the mock-drill.

After the mega mock drill, there was a final hot wash in which all the issued related to drill were discussed in detail. After it there was a media conference in which information about all the aspects of mock drill was given to media and their queries were replied.

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## SYNOPSIS

### 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)

- A state of art EOC was setup at DC office with facilities like 24X7 emergency helpline number 1077, wireless communication base station, hotline connection to other control rooms like fire, flood, police, Municipal Corporation, civil hospital etc. and internet based decision support system.
- EOC is meant to be focal point of disaster response and whole operation is to be managed from there. Incident commander and all nodal officers of district level departments are expected to be present during emergency situations in EOC.

### SENSITIZATION WORKSHOPS ON EARTHQUAKE RISK MANAGEMENT

- Workshops were organized by subject experts from NDMA for school/college students, judiciary, legislators, panchayati raj bodies, bureaucrats and technocrats for sensitizing them about earthquake risk reduction.
- Necessary arrangements like deployment of staff, publication of awareness material, food arrangements for participants, lodging and travelling of guest speakers was done. In total around 5000 participants attended these workshops.

### RAPID VISUAL SCREENING (RVS)

- All life-line and critical buildings should be identified in the district e.g. hospitals, collector office etc.
- RVS training should be given to PWD engineers.
- In all life-line structures RVS should be done and based on its results retro-fitting should be done.

### MEDIA PLAN

- An exhaustive media plan was formulated for awareness generation which included media like press media, sensitization workshops, TV coverage, nukkadnataks, rallies, posters, radio channels, goodwill ambassadors, hoardings, SMSs, painting competitions in educational institutions etc.
- Media and Information Officer (MIO) was appointed for collecting information from field and conducting press conference. Departments had also appointed their PROs at field level for sharing field information with media.
- Managing media is getting a tough task as media has become extra aggressive and often relies on lopsided reporting.

### EARTHQUAKE AND FIRE MOCK DRILLS IN SCHOOLS/EDUCATIONAL INSTITUTIONS

- Need to integrate fire and earthquake mock drill programme in curriculum of educational institutions as they are most vulnerable.

- Emergency Evacuation Plan and SOPs should be formulated and tested through mock-drills.
- School disaster management teams should be constituted and trained in specific tasks.
- Check condition of school buildings, install fire extinguishers and glow signs showing evacuation routes.

### COMMUNICATION SYSTEM DURING DISASTER

- Traditional line based and mobile based communication systems fail during disasters
- Need to find alternatives like wireless, HAM radio, satellite phones etc.
- An inventory of wireless and HAM radio devices need to be created and staff should be trained to operate them.

### PREPARATION OF RESOURCE INVENTORY AND MAPPING

- Ready human and material resource inventory increases efficiency of response, reduces response time, avoids unnecessary procurement and improves efficiency of deployment of resources.
- Detailed contact details of all officials posted in district, resources available with departments, storage spaces etc. were compiled and made available at EOC.
- Need to implement GIS based mapping of resources, fully activate the Indian Disaster Resource Network (IDRN) and devise a plan for yearly inspection of health of these resources.

### FORMATION OF INCIDENT RESPONSE TEAMS (IRTS)

- At field level, site specific IRTs were formed at 15 sites and 2 relief camps comprising of Site commander, medical team, police team, search and rescue team, fire team, public health team and power team. Site Commander was made overall in-charge of each incident site and had to report to Incident Commander.
- At base level, under the leadership of DC as Responsible Officer at EOC, different responsibilities like Liaison officer, safety officer, media and information officer, operations sections chief, planning sections chief, procurement & finance section chief etc. were assigned to various officials of district. Head of all line departments were designated as nodal officers.

### REVISION OF DISTRICT DISASTER MANAGEMENT PLAN AND SOPS FOR DEPARTMENTS

- District disaster management plan was revised by incorporating the concept of Incident Response System (IRS) into it. Hazard profiling and mapping was also carried out.

- 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



- Power department – emergency lights and inflatable lighting towers at incident sites, generators at lifeline buildings, cut off power during SAR operation
- PWD – provide for building maps, earthmoving machines and workforce to remove debris

### **MANAGING INTERACTION WITH NDRF, NDMA AND ARMY**

- When an exercise involves multi actor interaction, it is advisable to appoint single point nodal officer.
- Taking care of travel and accommodation of VIPs visiting district in relation to mock drill
- Providing infrastructural support to NDRF and Army teams in form of fuel, food and accommodation
- Maintaining co-operation and harmonious relations between district officials and outer agencies and managing any conflicts if they arise.

### **POST MOCK DRILL REPORTING**

- Reporting required for analysing the loose ends and evaluating performance.
- Specific format for reporting should be devised by NDMA after every mock drill

### **CONCLUSION**

- Disaster management is not a stand-alone concept. It embraces all angles of governance.
- NDMA should speed-up its efforts in capacity building, handholding of states, knowledge sharing, financial aid and imparting training. Recent report by CAG has shown the dark area of working of NDMA. Now it is the time that NDMA plugs these holes and ties loose ends.
- States should also take disaster management seriously and should evolve structures which are financially sound and have robust infrastructural support. These mock drills should not be considered as one time affair but this regime should be incorporated in all spheres of governance.



# 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.

### 1.3. 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 years 1983 to 2007 are as follows:-

### EARTHQUAKE

The entire Tinsukia district falls under the seismic zone V and so vulnerable in terms of

ABSTRACT OF NUMBER OF OCCURANCES OF RAINFALL FROM 1983 TO 2007 OF STATED INTENSITIES AND MORE WITH RESPECT TO DURATION									
Duration	Intensity of Rainfall (MM/Hour)								
	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)

Earthquake, as well as the whole district is on alluvial soil stratum and on the foothills of Himalayan range. The major earthquake in 1950 totally changed the physiographic appearance of Sadiya Sub- division and the whole road communication network was disrupted.

### **STORM**

There are frequent occurrence of storm and heavy rain in Tinsukia district especially in Margherita Sub- division. There are incidents of recurrent storm in the subdivision.

### **EROSION**

Erosion is a major problem in Tinsukia District. It will be mention-worthy that the effect of erosion in Dibru-Saikhowa WLS Division, a National Heritage spot, is of great importance as it may aggravate the effect of any major flood or earthquake in future causing heavy loss of human life and property along with wildlife.

### **INDUSTRIAL AND CHEMICAL ACCIDENTS**

Tinsukia is primarily an agricultural district with industrial areas accounting less than 1% of the total area of the district. There is IOCL refinery at Digboi & its marketing terminal at Tinsukia and CIL establishments in Ledonear Margherita along-with one LPG bottling plant at Gopanery near Makum Railway Junction. There are no major incidents in these establishments in the past except one terrorist attack on oil storage tank on 7/3/2003 and a fire broke out at PNGB Road in Digboi town due to oil pilferage from oil field on 13/5/2009. There are many small tea gardens and industries located near human habitats in the district which may pose a threat of contamination of paddy field as well as ground water causing damage to both human and livestock.

### **VULNERABLE POINTS OF TINSUKIA DISTRICT IN TERMS OF FLOOD**

Based on the previous history, Tinsukia district has an unexpected rainfall and flash flood. This district receives high amount of rainfall during the rainy season. As a result most of the rivers get excess water and experience floods. The major river flows through the district are Brahmaputra, Buri-dihing, Na-dihing, Dirak, Dibru, Dangori and Dhola river and that also cause annual floods and river bank erosion. The major rivers cause flood at least once a year.

The disaster management will be more effective and sustainable if it is institutionalized. For this purpose Government of India has already passed Disaster Management Act on 23rd December, 2005, where it is clearly outlined that a Disaster Management Authority to be formed at the district level. It will be the apex body at the district level. Disaster management would involve many layers of participating organization. The three focal levels would be State, District and the site of the disaster. The State level agencies would be involved in policy/decisions making, resource and budget allocation and monitoring through the State Emergency Operations Centre. Similarly, at district level a District Disaster Management Authority is already

formed and activated to mitigate any unexpected situation in the district. There are nine members included in this authority. The Institutional Framework for disaster management developed at the District, Revenue Circle and Village level is as follows:- At each level, apart from disaster management committee, each level has a disaster management plan along with the various task forces like search and rescue, first aid, early warning, shelter management, etc. Tinsukia district has its own district disaster management authority chaired by the Deputy Commissioner. Besides, the district disaster management committee is also working under Deputy Commissioner where all line departments are its member. The District Quick Response Team consists of 23 members belonging to various departments is also set up in the district. At Circle level, every Circle in the district has a Circle disaster management committee headed by Circle Officer. As said above all line departments at Revenue Circle level are its members. Also a search and rescue team as well as first aid team have been set up at every Circle. At village level, every Panchayats has a village disaster management plan as well as village disaster management committee.

The information dissemination at times of emergency for Tinsukia District has been laid down as under:

- (1) The Deputy Commissioner will be the nodal officer for this. He will apprise Addl. Deputy Commissioner, Project Officer (DM) and persons concerned, Circle Officers, Water Resource Dept., PWD (Roads) Dept. IWT Dept., Medical & Health Dept. through SMS and phone.
- (2) Deputy Commissioner will give direction to BSNL of Tinsukia District to immediate arrangement for alternative phone connectivity in the control room of Deputy Commissioner's Office. Nazarat Officer to take steps accordingly. DPO will also train control room duty personnel properly.
- (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 Circle Officers.
- (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 the 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 for informing 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 region. Historical records give the indication of the flood inundation areas and the period of occurrence and the extent of the coverage. Warning can be issued looking into the earlier marked heights of the water levels in case of potential threat.
2. The onset of storm is extensive and often destructive. A hazard map will illustrate the areas vulnerable to the storm in any given year.
3. Land use control will reduce the danger of life and property when waters inundate the flood plains. In areas where people already have built their settlements, measures should be taken to relocate to better sites so as to reduce vulnerability. No major development should be permitted in the areas which are subjected to high flooding. Important facilities should be built in safe areas.
5. Construction of engineered structures in the flood plains and strengthening of structures to with stand flood forces and seepage. The buildings should be constructed on an elevated area. If necessary build on stilts or platform. They should be wind and water resistant.

Protect river embankments. Communication lines should be installed underground. Provide strong halls for community shelter in vulnerable locations.

6. Flood Control aims to reduce flood damage. Measures such as reforestation, protection of vegetation, clearing of debris, conservation of ponds and lakes, etc.
7. Structural measures include storage reservoirs, flood embankments, drainage channels, anti-erosion works, etc. and non-structural measures include flood forecasting, flood proofing, disaster preparedness.





# 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. IRS , i.e. Incidence response 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 North West Disaster Management plan includes facts and figures those have been collected from various departments. North West Disaster management Plan is 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 tough 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 with Delhi Police whose main duty is to look after law & order of Delhi. In a mega city like Delhi even a small satsanghas tremendous capacity of gathering thousands 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 about this. 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 unregularised 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 do 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. Self-initiative is very low.

The political leadership scenario in Delhi is also very different from other states. Most of 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 co-incided 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 preventing disasters. First Aid Box were also shown & their importance was told to the people.

This time the focus of awareness was mainly for earthquake and fire prevention. Next time we will try to add pamphlets of other disasters also. With Revenue Camps becoming a regular practice of the district we are also planning to focus these camps from multiple to specific services & disaster awareness will surely be the part of it.

It is to be mentioned that Drawing Books based on disaster prevention theme were a hit among children during these camps. Hundreds of drawing books were distributed to the children in the span of three camps to generate "awareness with fun".



# Disaster Management in Cyclone Nilam - A Case of Tamilnadu

**Aneesh Sekhar S, IAS**

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 Thiruvottriyur 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.

So as a trainee learning the nuances in administration, I could get valuable insight into the nitty-gritty's of administration especially at the time of an emergency. 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.

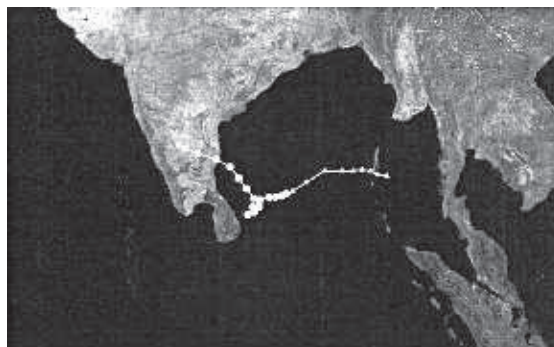
The administrative units of the district consist of both revenue villages and village Panchayat besides town panchayats and municipalities. Thiruvallur district comprises four revenue divisions, 9 Taluks, 14 blocks and 816 villages. Also there are 5 municipalities, 19 town Panchayats and 669 village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

Every year the district gets prepared to 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.

### **NILAM' - 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. 1131 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 of a low to mid-level subtropical ridge. 1151 Later 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 15<sup>th</sup> 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 Warning System (ii) list of vulnerable areas prone to flood and cyclone, (iii) information about

the relief centres and (iv) telephone numbers of all revenue staff upto the level of Village Administrative Officers and phone numbers of all staff including field staff of the departments concerned / voluntary organisations / NGOs., etc. and other important details

### **Inspection And Maintenance Of Rain Gauges**

Inspection of all the rain gauge stations in the district were carried out before the onset of Northeast monsoon and ensured that they are in working condition. The defects pointed out by the IMD officials during inspection of rain gauge stations in the district were rectified.

### **Fire And Rescue Service Department**

It was ensured whether the Department of Fire and Rescue Services have adequate stock of search and rescue equipments, viz., inflatable rubber boats, life buoys, life jackets and rubber dinghies, etc.

## **PUBLIC WORKS DEPARTMENT**

### **Inspection Of Cyclone Shelters And Other Public Buildings**

Instructions were given to the PWD authorities and Revenue officials to make inspection of cyclone shelters, school buildings, community halls and also private KalyanaMandapams identified for accommodating the displaced and affected population during the times of evacuation. It was also made sure that proper power supply and water supply facilities are available in the buildings. Similarly, all publicbuildings were inspected to check for possible clogging of storm water pipes. PWD authorities were instructed to issue prior intimation in case of release of excess water from the reservoirs to the local authorities so as to enable them .to take necessary precautionary measures like moving the people in low lying to safer places / carry out evacuation. Public were to be informed about such releases well in advance.

### **Removal Of Encroachments**

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. Also identification of alternative emergency routes for transportation of people affected by floodswere made.

All the culverts may be inspected, cleaned and desilted. Side berms of main roads may be shaped to allow free flow of water. In areas of likely water logging on road sides, rainwater harvesting pits / soak pits may 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**

GramaSabha 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 15` ..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 Thiruvottriyur 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 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.



Chapter 6

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 ready 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 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.

### 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 be 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 goods. It is one area if managed properly bring great credit or great shame to the administration. The key to managing any disaster is your 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 my



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.

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