

# Chapter I

## Introduction

### 1.1 Preface

India has been witnessing disasters since times immemorial and storm is one among them. In the past earthquakes, floods, cyclones, droughts and landslides have caused wide spread damage in the various parts of the country. Since Uttar Pradesh is not a coastal state and possibility of cyclone or hurricane is not there. Discussions with IMD, Lucknow have revealed that common forms of wind hazard in Uttar Pradesh are thunderstorm and squall and this State disaster Management Plan is aimed at mitigating the effected of thunderstorms and squall in the state. Thunderstorm and squall have got lesser attention as compared to other natural and man made calamities but they too are very damaging and need to be addressed seriously.

Storms influence human activity in such matters as agriculture, transportation, building construction, water impoundment, flood control, and the generation, transmission, and consumption of electric energy in various parts of India including Uttar Pradesh.

### Storm

A storm (from Common Germanic \*sturmaz "noise, tumult") is any disturbed state of an astronomical body's atmosphere, especially affecting its surface, and strongly implying severe weather. It may be marked by strong wind, thunder and lightning (a thunderstorm), heavy precipitation, such as ice (ice storm), or wind transporting some substance through the atmosphere (as in a dust storm, snowstorm, hailstorm, etc).

### Formation

Storms are created when a center of low pressure develops, with a system of high pressure surrounding it. This combination of opposing forces can create winds and result in the formation of storm clouds, such as the cumulonimbus. Small, localized areas of low pressure can form from hot air rising off hot ground, resulting in smaller disturbances such as dust devils and whirlwinds.

### Types

There are many varieties and names for storms in different geographical regions and climatic zones. Squall and thunderstorm are the two prevalent types of storms in Uttar Pradesh region.

### Squall

Squall is a sudden onset of wind increase of at least 16 knots (30 km/h) or greater sustained for at least one minute. As per weather code of IMD (1982) squall is defined as a sudden increase of wind speed by at least three stages on the Beaufort scale. The speed rising to force 6 or more and lasting for at

least one minute is called squall. It can be recorded by Dense Pressure Tube. Large branches in motion, whistling heard in telegraph wire umbrellas used with difficulty wind speed 22-27 knots or 39-49 km/hour.

- **Gale** : An extratropical storm with sustained winds between 34-48 knots (39-55 mph or 63–90 km/h).
- **Hailstorm**: A type of storm that precipitates chunks of ice. Hailstorms usually occur during regular thunder storms. While most of the hail that precipitates from the clouds is fairly small and virtually harmless, there have been cases of hail greater than 2 inches diameter that caused much damage and injuries.
- **Dust storm or Sand Storm**: As per weather code of IMD (1982) It occurs when owing to the action or a strong continuous wind or a squall, sand or dust is raised into atmosphere in sufficient quantity to reduce the horizontal visibility to below 1000 meters.

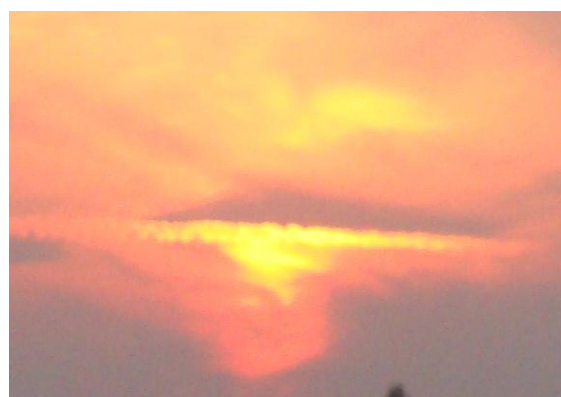
### Thunderstorm

A thunderstorm is a type of storm that generates lightning and the attendant thunder. It is normally accompanied by heavy precipitation. Thunderstorms occur throughout the world, with the highest frequency in tropical rainforest regions where there are conditions of high humidity and temperature along with atmospheric instability. These storms occur when high levels of condensation form in a volume of unstable air that generates deep, rapid, upward motion in the atmosphere.

The heat energy creates powerful rising air currents that swirl upwards to the tropopause. Cool descending air currents produce strong downdraughts below the storm. After the storm has spent its energy, the rising currents die away and downdraughts break up the cloud. Individual storm clouds can measure 2-10 km across.



A typical thunderstorm near Harpalpur in Hardoi district (U.P.) in the year 2008



Setting sun illuminates top of a thunder-storm cloud near Raibareli (U.P.) in 2008

A thunderstorm, also known as an electrical storm or a lightning storm, is a form of weather characterized by the presence of lightning and its effect: thunder. It is usually accompanied by heavy rain and sometimes snow, hail, or no precipitation at all. Thunderstorms may line up in a series, and strong or severe thunderstorms may rotate.

Warm air has a lower density than cool air, so warm air rises within cooler air, similar to hot air balloons. Clouds form as relatively warmer air carrying moisture rises within cooler air. As the moist air rises, it cools causing some of the water vapor in the rising air to condense. When the moisture condenses, it releases energy so that the rising packet of air cools less than its surrounding air, so it continues to rise. If enough instability is present in the atmosphere, this process will continue long enough for cumulonimbus clouds to form, which support lightning and thunder.

All thunderstorms, regardless of type, go through three stages: the **cumulus stage**, the **mature stage**, and the **dissipation stage**. Depending on the conditions present in the atmosphere, these three stages can take anywhere from 20 minutes to several hours to occur.

### **Cumulus stage**

The first stage of a thunderstorm is the cumulus stage, or developing stage. In this stage, masses of moisture are lifted upwards into the atmosphere. The trigger for this lift can be isolation heating the ground producing thermals, areas where two winds converge forcing air upwards, or where winds blow over terrain of increasing elevation. The moisture rapidly cools into liquid drops of water, which appears as *cumulus* clouds. As the water vapor condenses into liquid, latent heat is released which warms the air, causing it to become less dense than the surrounding dry air. The air tends to rise in an *updraft* through the process of convection (hence the term convective precipitation). This creates a low-pressure zone beneath the forming thunderstorm.

### **Mature stage**

In the mature stage of a thunderstorm, the warmed air continues to rise until it reaches existing air which is warmer, and the air can rise no further. Often this 'cap' is the tropopause. The air is instead forced to spread out, giving the storm a characteristic anvil shape. The resulting cloud is called *cumulonimbus incus*. The water droplets coalesce into larger and heavier droplets and freeze to become ice particles. As these fall they melt to become rain. If the updraft is strong enough, the droplets are held aloft long enough to be so large that they do not melt completely and fall as hail. While updrafts are still present, the falling rain creates *downdrafts* as well. The simultaneous presence of both an updraft and downdrafts marks the mature stage of the storm and during this stage considerable internal turbulence can occur in the storm system, which sometimes manifests as strong winds, severe lightning.

Typically, if there is little wind shear, the storm will rapidly enter the dissipating stage and 'rain itself out', but if there is sufficient change in wind speed and/or

direction the downdraft will be separated from the updraft, and the storm may become a supercell, and the mature stage can sustain itself for several hours. In certain cases however, even with little wind shear, if there is enough atmospheric support and instability in place for the thunderstorm to feed on, it may even maintain its mature stage a bit longer than most storms.

### **Dissipating stage**

In the dissipation stage, the thunderstorm is dominated by the downdraft. If atmospheric conditions do not support super cellular development, this stage occurs rather quickly, approximately 20–30 minutes into the life of the thunderstorm. The downdraft will push down out of the thunderstorm, hit the ground and spread out. The cool air carried to the ground by the downdraft cuts off the inflow of the thunderstorm, the updraft disappears and the thunderstorm will dissipate.

### **Classification**

There are four main types of thunderstorms: single cell, multicell, squall line (also called multicell line) and supercell. Which type forms depends on the instability and relative wind conditions at different layers of the atmosphere ("wind shear").

#### **Single cell**

This term technically applies to a single thunderstorm with one main updraft. Within a cluster of thunderstorms, the term "cell" refers to each separate principal updraft.

Thunderstorm cells can and do form in isolation to other cells. Such storms are rarely severe and are a result of local atmospheric instability; hence the term "air mass thunderstorm". These are the typical summer thunderstorm in many temperate locales. They also occur in the cool unstable air which often follows the passage of a cold front from the sea during winter.

#### **Multicell cluster**

Multicell storms form as clusters of storms but may then evolve into one or more squall lines. They often arise from convective updrafts in or near mountain ranges and linear weather boundaries, usually strong cold fronts or troughs of low pressure.

#### **Multicell lines**

Multicell line storms, commonly referred to as "squall lines", occur when multi-cellular storms form in a line rather than clusters. They can be hundreds of miles long, move swiftly, and be preceded by a gust front. Heavy rain, hail, lightning, very strong winds and even isolated tornadoes can occur over a

large area in a squall line. Bow echoes can form within squall lines, bringing with them even higher winds.

**Threats from Thunderstorm:**

- **Downbursts**
- **Large Hail**
- **Cloud-to-Ground Lightning**
- **Flash Flooding**

Each year, many people are killed or seriously injured by severe thunderstorms despite the advance warning. While severe thunderstorms are most common in the spring and summer, they can occur just about any time of year. Lightning is one of the major threats during a severe thunderstorm.

**Occurrence of thunderstorms**

Thunderstorms occur throughout the world, with the greatest frequency in tropical rainforest areas, where they may occur nearly daily. Thunderstorms are associated with the various monsoon seasons around the globe, and they populate the rainbands of tropical cyclones.

**Lightning**

Lightning is an electrical discharge that occurs in a thunderstorm. It can be seen in the form of a bright streak (or bolt) from the sky. Lightning occurs when an electrical charge is built up within a cloud, due to static electricity generated by supercooled water droplets colliding with ice crystals near the freezing level. When a large enough charge is built up, a large discharge will occur and can be seen as lightning. The temperature of a lightning bolt can be five times hotter than the surface of the sun. Although the lightning is extremely hot, the duration is short and 90% of strike victims survive. Contrary to the popular idea that lightning does not strike twice in the same spot. The loud bang that is heard is the super heated air around the lightning bolt expanding at the speed of sound. Because sound travels much more slowly than light the flash is seen before the bang, although both occur at the same moment. There are several types of lightning:



- In-cloud lightning is the most common. It is lightning within a cloud and is sometimes called intra-cloud or sheet lightning.
- Cloud to ground lightning is when a bolt of lightning from a cloud strikes the ground. This form poses the greatest threat to life and property.
- Ground to cloud lightning is when a lightning bolt is induced from the ground to the cloud.
- Cloud to cloud lightning is rarely seen and is when a bolt of lightning arcs from one cloud to another.
- Ball lightning is extremely rare and has several hypothesized explanations.

Thunderstorms and squalls have got lesser attention as compared to other natural and man made calamities although they also have had devastating effects in the past on human beings, cattles, crops and infrastructure and thus need to be addressed seriously. Thunderstorm and squall are the common forms of storm in the state of Uttar Pradesh. Only generalized predictions are there for squall in various parts of the state. Unlike cyclones its very precise prediction has not been possible due to non existence of a system on the pattern of cyclone detection and warning system. Such a system should be in place in Uttar Pradesh and IMD can upgrade its weather monitoring facilities.

Thunderstorm and or squall is an unavoidable frequent phenomenon but careful planning, design and the appropriate measures can minimize the damaging effects.

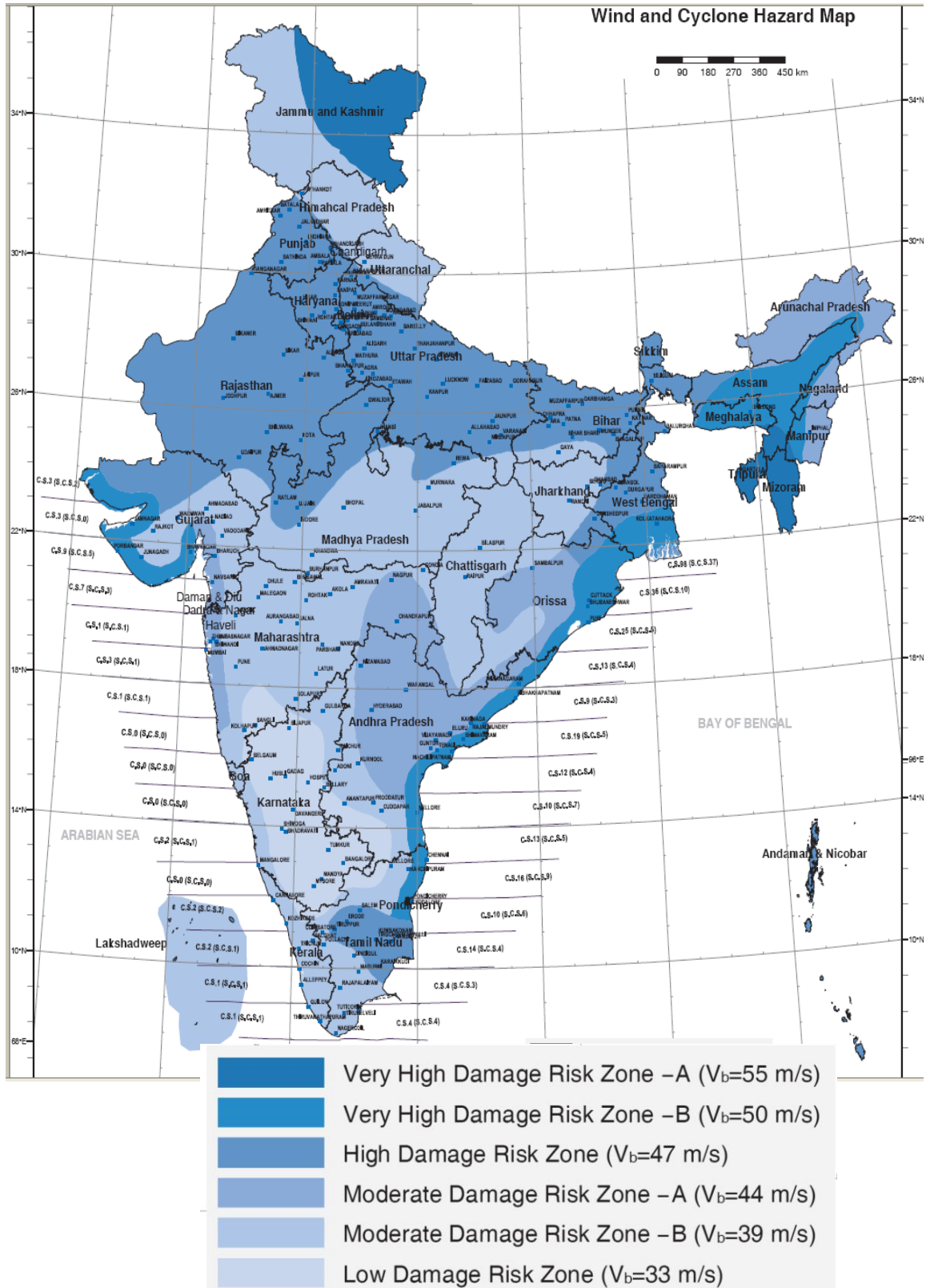
Storms are being monitored by India Meteorological Department, Gol. The disaster can be made much worse due to the vulnerability of the community itself.

## 1.2 Objectives

- i) To significantly reduce the risk of loss of life, injuries, economic losses particularly damage to crops and fruit crops due to thunderstorms and squall in various parts of Uttar Pradesh or near by region with adverse effects on Uttar Pradesh as well.
- ii) To promote a culture of preparedness by ensuring that Disaster Management receives the highest priority at all levels.
- iii) To devise appropriate guidelines and strategies for applying existing scientific and technical knowledge and available resources for timely response and recovery.
- iv) To improve the capacity of the state to respond promptly and effectively to mitigate the adverse effects of thunderstorm and squall.

- v) To foster scientific and engineering endeavors aimed at addressing critical gaps in knowledge.
- vi) To develop measures for the assessment, prediction and mitigation of thunderstorms and squall through coordinated efforts with the Central Government, wherein the central government can strengthen the IMD network in Uttar Pradesh for forecasting the thunderstorms and squall.
- vii) To undertake reconstruction as an opportunity to build disaster resilient structures and habitat.
- viii) To ensure that community is the most important stakeholder in the Disaster Management process.
- ix) To evolve a coordinated strategy for thunderstorms and squall disaster risk reduction in U.P. with the involvement of all the stake holders in thunderstorms and squall disaster management (administration, line departments, scientists, engineers, PRIs, NGO, CBOs and above all the farmer community)

## Chapter II Vulnerability Assessment of the State



BMTPC: Vulnerability Atlas-2<sup>nd</sup> Edition: Peer Group, HoH & UPA: Map is based on digitized data of SOI, GOI, Basic Wind Speed Map 1S875 (3)-1987: Cyclone Data, 1877-2005, IMD, GOI



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## 2.1 A Brief Profile of Uttar Pradesh

Most of the state of Uttar Pradesh lies in the Gangetic Plain and has a population of 16,61,98,000 according to 2001 census and has an area of 240,928 sq. km. There are 71 districts, 312 tehsils, 820 blocks and 107452 villages. The State has population density of 689 per sq. km. (as against the national average of 312). Uttar Pradesh is bounded by Nepal and Uttarakhand on the North, Himachal Pradesh on the north west, Haryana on the west, Rajasthan on the south west, Madhya Pradesh on the south and south-west, and Bihar on the east and Jharkhand on the south east. Situated between 23° 52'N and 30° 25'N latitudes and 77° 3' and 84° 39'E longitudes, this is the fourth largest state in the country. A part of Uttar Pradesh has been separated and formed into a new state Uttarakhand on November 9th 2000.

Uttar Pradesh can be divided into two distinct phypsographical regions:

- (i) The Gangetic plain in the centre
- (ii) The Vindyan hills and plateau in the south

Geologically this region is a fore-deep, a down warp of the Himalayan foreland, of variable depth, converted into flat plains by long-vigorous sedimentation.

### 2.1.1 Status of UP as per Wind Hazard Map of India

As per Building Materials and Technology Promotion Council (BMTPC) Vulnerability Atlas (2005) almost entire Uttar Pradesh (except part of Lalitpur, Sonbhadra and Mirzapur districts) lies in **High Damage Risk Zone of Wind Hazard**. Lalitpur, Sonbhadra and Mirzapur districts fall in Moderate Damage Risk Zone.

### 2.1.2 Cause for damages (in Uttar Pradesh) due to thunderstorm and squall

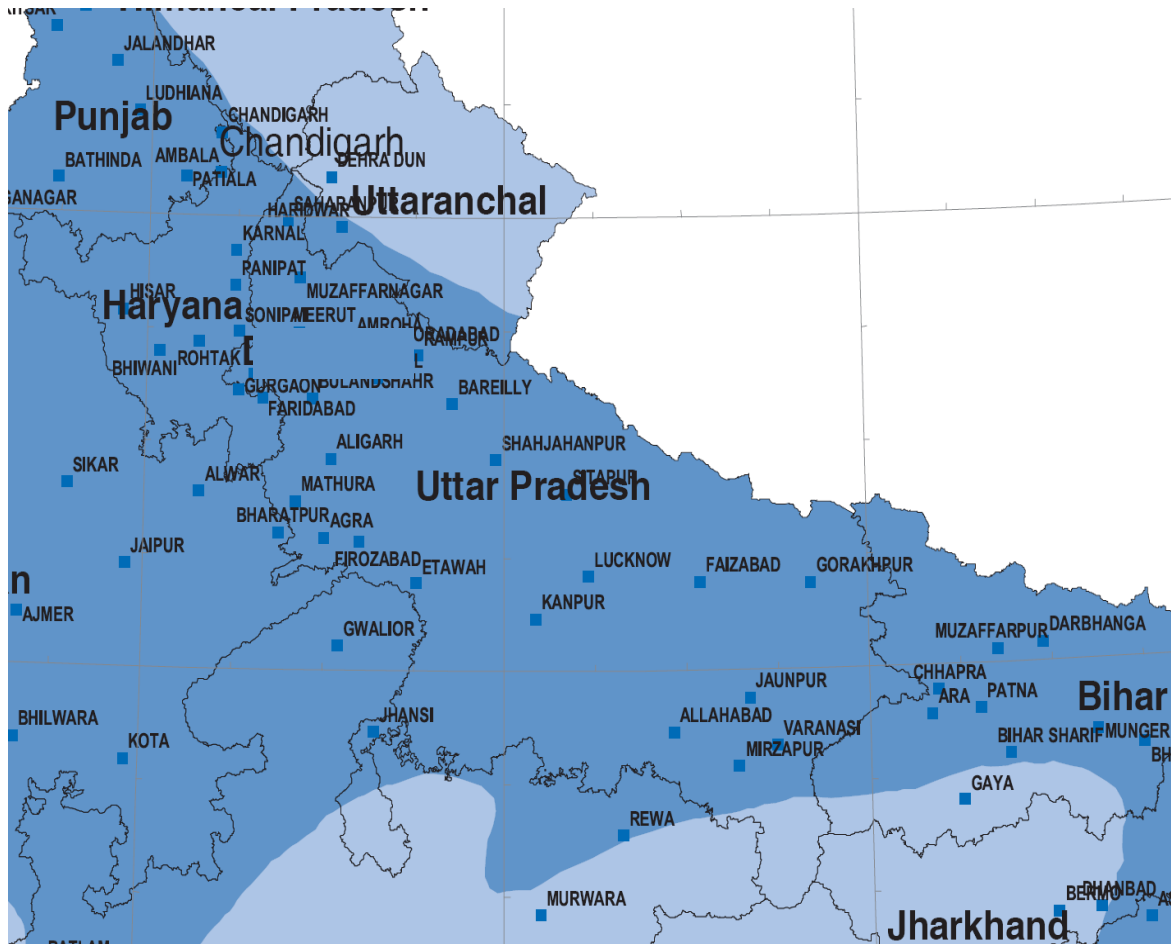
Damage to life and property in various parts of Uttar Pradesh is caused mainly due following factors:

- Falling of man-made structures like hoardings, electricity poles., telephone poles which results in the loss of human lives, injuries and cattle heads.
- Open uncovered spaces for storing the harvested crop within the crop fields result in loss of large amount of harvested crops in the event of a thunderstorm coupled with rains or hail storm.

- Climatic phenomena are recorded by India Meteorological Department, Gol and absence of any forewarning system (for thunderstorm and squall) such as Doppler radar or Lightning Arrester with in the territory of Uttar Pradesh makes it virtually impossible to predict the thunderstorm and squall.

Lack of preparedness and awareness; so far, Thunderstorm and squall disaster mitigation efforts are mostly reactive.

### Wind Hazard Map of Uttar Pradesh



	High Damage Risk Zone ( $V_b=47$ m/s)
	Moderate Damage Risk Zone – B ( $V_b=39$ m/s)

Not to scale

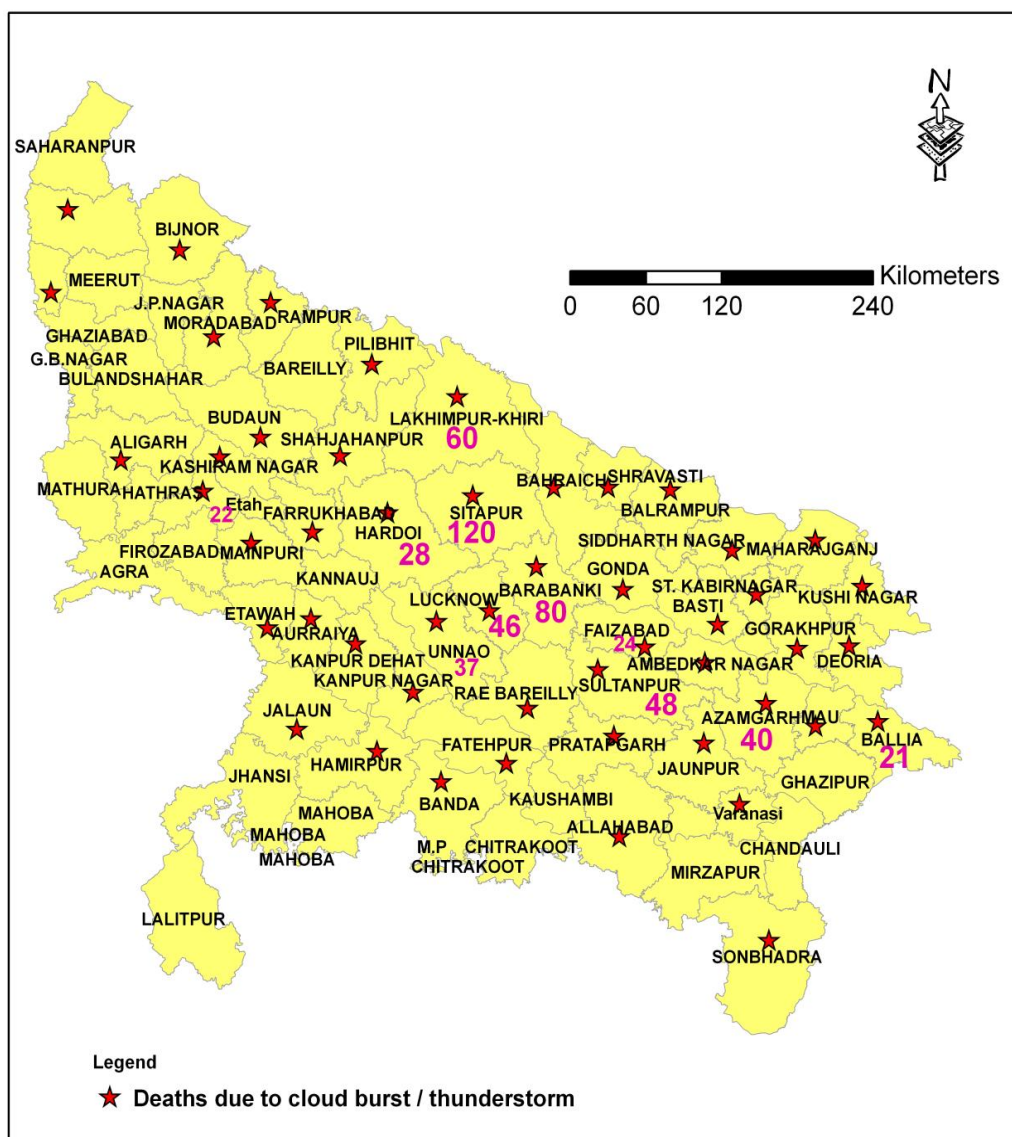
BMTPC: Vulnerability Atlas-2<sup>nd</sup> Edition: Peer Group, HoH & UPA: Map is based on digitized data of SOI, GOI, Basic Wind Speed Map 1S875 (3)-1987: Cyclone Data, 1877-2005, IMD, GOI

**Table 1: Casualties due to lightening, cloud burst and floods in the year 2008**  
(Source : State Emergency Operation Centre, Lucknow)

SI.No.	Districts	Number of casualties due to			
		Lightening	Cloud Burst	Flood	Total
1	Agra				0
2	Aligarh		4		4
3	Allahabad		11		11
4	Ambedkar Nagar	1	14		15
5	Auriya		9		9
6	Azamgarh	8	40	16	64
7	Badaun	1	13	1	15
8	Bagpat		1		1
9	Bahraich		40	35	75
10	Ballia	9	21	22	52
11	Balrampur		2	2	4
12	Banda		2		2
13	Barabanki	2	80	5	87
14	Bareilly				0
15	Basti		6	12	18
16	Bijnore		5		5
17	Bulandshar				0
18	Chandauli		1		1
19	Chitrakoot	4			4
20	Deoria	2	6		8
21	Etah		22		22
22	Etawah	1	10		11
23	Faizabad	4	24	2	30
24	Farrukhabad		9		9
25	Fatehpur		27		27
26	Firozabad	2	8		10
27	G.B. Nagar				0
28	Ghazipur				0
29	Ghaziabad				0
30	Gonda	2	17	1	20
31	Gorakhpur	7	13	9	29
32	Hamirpur	5	2		7
33	Hardoi	1	28	1	30
34	Mahamaya Nagar				0
35	Jalaun	1	2		3
36	Jaunpur	1	2		3

Uttar Pradesh State Disaster Management Plan for Hurricanes / Storms (Thunderstorm & Squall)

Sl.No.	Districts	Number of casualties due to			
		Lightening	Cloud Burst	Flood	Total
37	Jhansi				0
38	J.P. Nagar				0
39	Kannauj	2	7	1	10
40	Kanpur Nagar	2	1		3
41	KanpurDehat	2	13		15
42	Kaushambi		12		12
43	Lakhimpur Kheri		60	25	85
44	Kushinagar	2	2		4
45	Lalitpur				0
46	Lucknow		46	2	48
47	Maharajganj	3	6	8	17
48	Mahoba				0
49	Mainpuri		2		2
50	Mathura				0
51	Mau		3	1	4
52	Meerut				0
53	Mirzapur				0
54	Moradabad	8	11		19
55	Muzaffarnagar	2	4		6
56	Pilibhit		4		4
57	Pratapgarh	1	34		35
58	Raebareli	1	18		19
59	Rampur		5	2	7
60	St. Kabir Nagar	1	15	14	30
61	St. Ravidas Nagar				0
62	Shahajanpur	2	30		32
63	Saharanpur		1		1
64	Shrawasti	2	2		4
65	Sidharthnagar	3	15	11	29
66	Sitapur	3	120	3	126
67	Sonbhadra	11	3		14
68	Sultanpur	4	48	1	53
69	Unnao	1	37	2	40
70	Varanasi	1	9		10
71	Kashiram Nagar		5		5
		<b>102</b>	<b>932</b>	<b>176</b>	<b>1210</b>



Map of UP showing major casualties due to thunderstorm in the year 2008

## 2.1.3 Recent cases History of Storm events in Uttar Pradesh

### Squall kills four in Uttar Pradesh on May 11, 2002

SANT KABIR NAGAR (U .P) MAY 11. Four persons, including a ten-year old boy were killed and seven injured here following a squall on Friday night, official reports said today. Two persons, who had come to visit their relatives in village Shiv Bakhri, died when a huge tree fell on them while they were sleeping, the reports said. Another person died in Nakhi-Naghi village when a roof of a house collapsed. ( PTI / The Hindu Sunday, May 12, 2002).

**17 killed, scores injured as squall hits parts of UP** June 12 2003 04:36 Hrs (IST)

Lucknow: At least 17 people were killed and scores injured in a squall, which brought down houses and walls in parts of Uttar Pradesh, official sources said in Lucknow on June 12.

The havoc, caused by strong winds on June 11, claimed nine lives in Sultanpur district while three deaths were reported from Ambedkar Nagar and two each from Barabanki and Ballia and one from Ghazipur, they said. The dead included three children who were fatally injured when boundary walls of a mango orchard collapsed in Ambedkar Nagar. A dozen others were also injured in the mishap. Several persons were injured when the minaret of a mosque collapsed in Gonda district, sources said. The squall also uprooted telephone polls and trees affecting communication in the eastern region of the state. A large number of cattle were also killed in the storm, sources added.

**Squall claims 45 lives in Uttar Pradesh in Kanpur/Etawah(UP), May 15, 2008 according to PTI**

High velocity winds and a squall have claimed at least 45 lives in various parts of Uttar Pradesh. Dozens were injured and several people are reported to have died during the storm. A temple wall also collapsed, injuring four persons and killing one.

The storm also brought vehicular traffic to a grinding halt. In another incident, a fire erupted in Etawah, resulting in the loss of nine lives and damage to property. Villagers tried to save their houses and crops from the blaze. Charred remains of property and humans were visible all round. The maximum casualties were reported from Kannauj where 12 persons had died. Meteorological sources said the storm was caused by cyclonic circulation over northern India.

**Nearly Eighty people killed by thunder lightning and wind storm in Uttar Pradesh and Delhi on May 14, 2008**

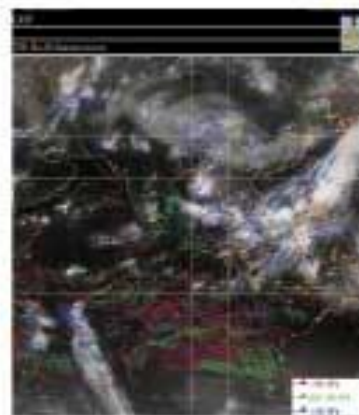
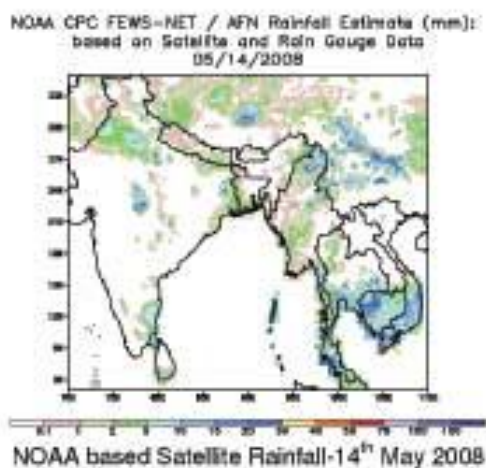
(Source: TIMES OF INDIA, 15th May 08)

**17 killed in Uttar Pradesh Storm May 27th, 2008 - 1:38 pm**

Lucknow, May 27 (IANS) At least 17 people have been killed in over 10 districts of Uttar Pradesh as house collapsed, trees were uprooted and hoardings were destroyed in a storm, officials said Tuesday. With details of the damage done by Monday's storm still being collected, officials said the deaths were reported from Unnao, Etawah, Meerut, Pratapgarh, Hardoi, Banda, Raibareilly, Sultanpur, Kannauj, Barabanki and Lakhimpur districts of the state.

The highest number of deaths was reported from Unnao district where five people were killed in Hasanganj and Shakhipur towns as walls collapsed in

the storm. Strong winds left Bareilly, Shahjahanpur and Badaun districts without electricity for hours. According to officials of the meteorological department, the state will continue to witness squalls and cloudy skies for the rest of the week. In state capital Lucknow, the wind reached a speed of 94 kmph during the storm and there was 2.6 mm of rainfall.



Cloud movement vector

### **Hailstorm, thundershowers claim 20 lives in Uttar Pradesh on May 12th, 2009 - 1:51 pm ICT by IANS –**

Lucknow, May 12 (IANS) At least 20 people have been killed in rain-related incidents in Uttar Pradesh after thundershowers and hailstorm lashed the state Monday night, an official said Tuesday. Wall and ceiling collapses caused most of the casualties. With the details of the damage caused by hailstorm and rains are still being collected, officials said the casualties were reported from eight districts namely Hardoi, Kannauj, Aligarh, Lucknow, Barabanki, Varanasi, Etawah and Farrukhabad. The maximum number of deaths were reported from Hardoi where seven people died in incidents of wall and ceiling collapse.

### **Dust storms hit mango output in Uttar Pradesh**

**Lucknow, May 21, 2009:** High velocity dust storms and squalls might have given relief to the heat-struck people of Uttar Pradesh but mango growers have been hard hit with over 50,000 tonne of the delectable fruit falling prey to the gusty winds.

The first dust storm hit the state on May 14 with a speed of 80 km per hour. This was followed by more storms on May 16, 17 and 18, forcing mango growers to sell the king of fruits as low as Rs one per kg in the open market. "The mango crop this year was bumper but due to the dust storm over 25% of it has got destroyed. In terms of money, the losses amounted to over Rs 50 crore in Lucknow alone," a senior official of the Horticulture department told PTI.

“We were expecting good earnings but the dust storm has damaged the crop and we have to sell mangoes at Rs one per kg in the market,” Mohammad Riyaz, a mango grower in Rahimabad belt, said.

Another mango grower Mohammad Irshad of Malihabad said this is for the first time in the past one decade that they had to sell their produce at Rs one per kg. “I have sold two tonne of mangoes at throwaway price of a meagre 40 paisa per kg to a dealer to avoid transportation costs and further damage to the crop while taking it to the market in Lucknow,” Irshad said.

The state on an average produces mangoes worth over Rs 2,700 crore and **all major mango belts including one in Saharanpur, Unnao, Pratapgarh, Bulandshahr, Meerut and Barabanki besides Lucknow have suffered losses due to the storms,** the department sources said.

“The losses to the mango crop will also adversely affect its export to Singapore, Japan and Gulf countries,” said president of All India Mango Growers Association, Inqram Ali. (PTI / The Financial Express 10June,2009).

## 2.2 Hazard and Vulnerability and Assessment and Hazard Forecast

Hazard assessment aims at establishing the following:

- (a) Nature, severity and frequency of hazard
- (b) The area likely to be affected.
- (c) Time and duration of impact.

Hazard zoning work should be done in detail to the level of micro and the area must be clearly marked on the map that whether it is vulnerable to mild, moderate or intensive hazard and the probable cost of damages to crops from the squall events or thunderstorm of different intensity must be included in the report. The services of IMD, Gol, New Delhi; Department of Atmospheric Sciences, University of Allahabad, Department of Geophysics (Meteorology) B.H.U Varanasi and Lucknow University, Lucknow are proposed for this work.

In relation to disaster, risk has been more specifically described as the probability that a disaster will occur using relative term such as high risk, average risk and low risk to indicate the degree of probability. The risk assessment includes an evaluation of all elements that are relevant to an understanding of the existing hazards and their effect on specific environment. There are several steps in risk assessment based on the related processes of hazard mapping vulnerability analysis. They establish nature, location and scale of risks to society and its assets. This information can assist decision makers in decision what can and should be protected and up to what level.



### **2.2.1 Direct Connectivity between IMD, Lucknow and State Emergency Operations Centre**

Direct Connectivity between IMD, Lucknow and State Emergency Operations Centre is required for access and Dissemination of Thunderstorm related Information in near real time.

### **2.2.2 Geographical Information System (GIS) based Resource Database Creation for effective Disaster Response**

GIS based database can be an important input for State and District Disaster Management Action Plan. In the event of a devastating thunderstorm in an area the decision makers can utilize the health facility database for knowing the location of nearest hospitals and their connectivity to the affected area and available paramedical staff, number of ambulances, equipments and other resources in these hospitals. This kind of database can certainly help the decision makers/ disaster managers in enlisting the medical aid and mobilizing paramedical workers within a relatively short span of time. Stockpiling the food grains received from various sources (for distribution among disaster affected community) remains a big problem for relief workers. Here, the disaster managers can utilize the GIS based database for immediately identifying the warehouses in the vicinity of disaster affected area. Food grains received (as relief) from various agencies can be transported and stored in these warehouses as per their capacity. The attribute data in GIS database about the capacity (in number of bags) of these warehouses and their distance from the base warehouse can be further utilized in better managing the transportation, storage and distributions of food stocks in disaster affected area (Uniyal, 2007).

**Remote Sensing Applications Centre-Uttar Pradesh (RSAC-UP) should be given financial resources for providing the above said information (through study of latest high resolution satellite images and GIS analysis)**

### **2.2.3 Access to Information**

Thunderstorm vulnerability and risk related information received from IMD should be made available on state website and should also be broadcast on radio and local TV channels. Public Broadcasting Systems can also be used to sound warning for severe thunderstorm with regular updates to be given thereafter. General public should also be sensitized about it through TV / Radio programs and print media.

### **2.2.4 Need for establishing a Thunderstorm and Squall Research and Forecasting Centre in Uttar Pradesh for Streamlining Forecasting, warning and alert system**

A centre for excellence in Basic Research on Thunderstorm and Squall should be established in Uttar Pradesh for accurate Weather and Climate Forecasts. For this purpose initially a working group should be formed comprising experts

from IMD, New Delhi; Department of Atmospheric Sciences, University of Allahabad; Center for Atmospheric and Oceanic Science, Center for Atmospheric and Oceanic Sciences, Indian Institute of Science, Bangalore; Indian Institute of Tropical Meteorology (IITM), Pune should. This working group should be entrusted upon the task of preparing a the blue print for establishing **Thunderstorm and Squall Research and Forecasting Centre in Uttar Pradesh** with its primary functions to promote, guide and conduct research for timely forecast of thunderstorm and squall and to develop the means to carry out the hazard zonation and vulnerability analysis for thunderstorm and squall in Uttar Pradesh.

## Chapter III

# Preventive Measures

Disaster prevention covers measures aimed at impeding the occurrence of a disaster event and/ or preventing such an occurrence having harmful effects on communities. It is important to note here that the occurrence of thunderstorm and squall can't be impeded. However their harmful effects on population, crops and fruit crops in particular can be minimized through a number of measures.

### 3.1 Action taken by the State Government from time to time after damages caused by thunderstorm/squall

The State Govt. pays the relief to the victims including the farmers in the event of damages to crops and houses. Ex-gratia payment is also made to the family of those who lost their lives due to natural calamities. The **Uttar Pradesh Disaster Management Act, 2005** is also aimed at effective mitigation and management of disasters in the state of Uttar Pradesh.

### 3.2 Prevention and Mitigation Strategy

The problem of protecting the crops from the damaging effects of thunders/squall is intimately related to the precise and area specific prediction of this weather phenomena and creation of proper storage facilities within the crop fields. The development of storage facilities can be achieved through following three means:

- i) Allocation of separate funds by Agriculture/ Rural Development / Pancayati Raj Department for creation of proper storage facilities for harvested crops.
- ii) Awareness generation among village level officials and workers of Department of Rural development and Revenue Department and members of PRIs to facilitate the creation of proper storage facilities for harvested crops.
- iii) Awareness generation among masses specially farmers to initiate the community efforts for creation of such facilities.
- iv) Awareness generation among NGOS, CBOs/ self help groups to help the community to create storage facilities.

#### 3.2.1 Sensitization of Disaster Managers, Planners and Decision Makers

Sensitization of planners and Decision Makers can immensely help in minimizing the harmful effects of thunderstorm and squall on communities. The first and foremost is awareness generation among policy makers, administrators, engineers, architects as well as the general public and farming community in particular. The elements and specific target groups to be included under the 'Programme on Sensitization' are given below:

- i) Training of members of State, District and Tehsil Crisis Management Committees, PRIs, municipal bodies and Village Disaster Management Committees about the need for creation of proper storage facilities for harvested crops.  
**(Implementing Authority/Departments: Relief Commissioner, Divisional and District Administration).**
- ii) Training of administrators, executives and engineers of Rural Development Department and official of Agriculture Department about the need for creation of proper storage facilities for harvested crops.  
**(Implementing Departments: Disaster Management Cell, Aliganj Lucknow, Rural Development, Agriculture Department).**

### 3.2.2 Awareness generation among masses:

Public awareness and education helps in improving the disaster resilience of masses. The following action should be taken for this purpose:-

- (I) The district media campaign must include disaster mitigation and contingency plan education with special focus on damages to crops due to thunderstorm/squall. Adequate fund may be considered to be provided to actively pursue this activity.
- (II) At the time of melas, fares, exhibitions specially at the village level posters, audio-visual presentations brochures etc. shall be made available in simple local language. Special leaflets be prepared in various aspects like do's and don't's before, during thunderstorm/squall general hygiene and primary health, family planning etc. and be made available to such places/ events.
- (III) There shall be regular talk / presentation on Radio/TV to increase general awareness regarding on damages to crops due to thunderstorm and squall. Relief Commissioner may also instruct local radio stations and TV channels to broadcast /television programme on usefulness of creation of proper storage facilities for harvested crops.
- (IV) Disaster mitigation shall be included as a component in urban based and rural based special programmes such as universal-literacy, education for all, family planning programme etc. Since the functionaries working under these plans visit villages regularly & have good rapport with the villagers, their active involvement in the disaster mitigation programme will increase its effectiveness.
- (V) After the members of Crisis Management Groups at the state, district, tehsil and village level the other government officials, NGOs, CBOs and PRI members shall also be given training at state, district, tehsil and municipality level and various line departments such as Rural Development, Agriculture and Forest. etc. The training and awareness literature shall be provided by the Relief commissioner and DMC to the District Magistrate. **(Implementing authorities are Relief Commissioner, Govt. of U.P., various line departments & District Magistrate.)**

- (VI) The students and children are the harbinger of new idea & change because of their scientific temper. Lessons on the natural phenomenon & disaster mitigation should be included right from primary level up to intermediate level. This would be measure for sending the message on disaster management to every house. **(Implementing authorities Relief Commissioner, Deptt. of Education).**

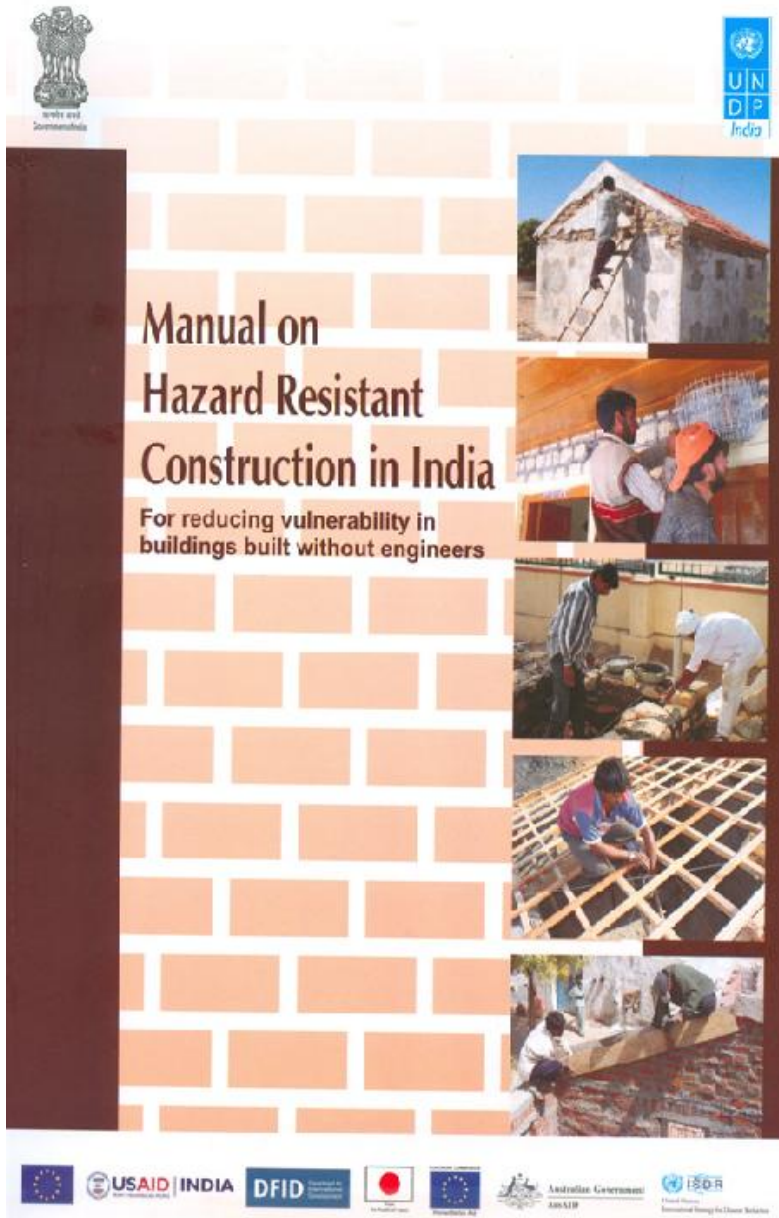
### 3.3 Hazard Resistant Construction

UNDP and National Disaster Management Authority (NDMA), Ministry of Home Affairs, Government of India have released a **“Manual on Hazard Resistant Construction in India” for the non-engineered buildings** in July 2008. It is made by Mr. Rajendra Desai (a structural engineer) and Ms. Rupal Desai (an architect) the Joint Directors of National Centre for Peoples’-Action in Disaster Preparedness (NCPDP).

The popular load bearing masonry building systems in different parts of the country are covered in the manual. It covers various hazards in India including those in the Wind Speed Zones of 47 to 55 m/second and the areas prone to severe floods. Relevant building codes and guidelines of the Bureau of Indian Standards form the basis for this manual. In addition the two decades of work carried out by the authors focusing on the promotion of suitable building technologies in different parts of the country and on the on-site training of building artisans and engineers, as well as the post disaster assessments of damages in various disasters provide the backbone of this manual. The in-depth documentation of their work provides a huge resource of visuals to tap from for this publication with the main purpose of ensuring effective communication.

The manual would be invaluable to the house designer, field engineers, contractors, site supervisors, literate artisans, and even a potential house owner. It covers not only new construction, but also the repairs and the retrofitting of the existing structures. It also throws light on the critical aspects that must be adhered to in new construction to ensure good performance in a likely disaster. Appropriate visuals have been used to make this manual user-friendly. In the section on repairs of damage and retrofitting of existing buildings, every important aspect has been covered step by step using visuals. Finally, at the end, a small chapter covers the non-engineered RC construction focusing specifically on the most critical aspects of the reinforcement details which too are routinely violated resulting in to much destruction in the event of the earthquake or a cyclone.

It is hoped that this manual will contribute towards ensuring better structural performance in the face of potentially destructive natural hazards, and thus bring safety to the people, rich and poor alike in India.  
([http://rapidshare.com/files/209014789/UNDP\\_MANUAL-2.pdf](http://rapidshare.com/files/209014789/UNDP_MANUAL-2.pdf))



## Chapter IV

# Integration of Mitigation Measures with the Development Plan

The best way to integrate mitigation measures with the development plan can be through adoption of natural disaster resistant construction. There is a harsh need to adopt wind hazard resistant designs of various infrastructure facilities such as power stations and substations, transformers and communication infrastructure.

### **4.1 Natural disaster resistant storage facilities for harvested crops**

Agriculture Department in partnership with the Rural Department should initiate the creation of natural disaster resistant storage facilities for harvested crops so that the damages to the harvested crop lying on the open crop fields can be minimized from the natural hazards such as thunderstorm, squall and fires.

### **4.2 Installation of modern state of the art thunderstorm forecasting devices by IMD**

State Crises Management Group (SCMG) shall request IMD, GOI, New Delhi to come up with a detailed plan to install the modern state of the art thunderstorm forecasting devices in the areas which according to IMD records are worst hit by thunderstorm during the past years.

### **4.3 Underground electricity cables:**

Underground electricity cables and telephone lines are best suited particularly for the congested townships where squall and or thunderstorm may cause falling of electricity and telephone poles and snapping of cables. This not only results in power failure and defunct basic phones but also leads to a number of casualties and head injuries. U.P Electricity Board may look into the various aspects of laying underground electricity cable particularly in the congested areas of cities and townships of Uttar Pradesh.

### **4.4 Some measures for Integrating Development schemes with Disaster Management Schemes**

- New projects on agriculture, horticulture and rural development should have provisions for the creation of natural disaster resistant storage facilities for harvested crops within the crop fields, orchards or in their vicinity on panchayat land.
- The govt. will also consider for the enhancement of the construction cost of roads and canals passing through the agriculture fields, so that the

additional money can be utilized for the creation of natural disaster resistant storage facilities for harvested crops.

- The Forest Department shall consider seriously the demand for the allotment / sale of the trees uprooted due to natural calamities like storm, heavy rains etc. to the people of locality on the recommendation of Patwari & Gram Pradhan for making timber available for the construction/reconstruction of the houses and or storage facilities for harvested crops.



## Chapter V

# Preparedness Measures

The lessons learnt from various thunderstorm and squall events in India in general and in Uttar Pradesh in particular regarding rescue and relief works and the shortcomings experienced in the process should be carefully and honestly noted and brought out including such as the following:

Lack of communication and transportation, undue delays in clearing the roads and or streets blocked due to the falling of trees, electricity poles and hoardings that further delays in the immediate transportation of the injured to the nearby hospital.

The hierarchical structure for execution needs to be formalized so that all efforts are properly coordinated. Coordination of all relief distribution is as important as its quantity and timely delivery; otherwise some places may receive it in duplicate and triplicate and some places remain completely starved.

Vulnerability assessment of buildings, structure/infrastructure, lifelines, economy and people should be undertaken.

The occurrence of thunderstorm and or squall is a natural hazard over which man has no control at present. Its prediction with respect to precise time, place or intensity of occurrence is still not feasible. But this natural hazard gets converted into a disaster to the society only when we fail to construct the storage facilities for the just harvested crops. Enough experience has been gained world wide and researches carried out in India which give us confidence to minimize the damages to crops and human casualties and loss of cattle heads due the onslaught of thunderstorm and or squall.

### 5.1 Present state of technical preparedness for forecasting thunderstorm and squall in Uttar Pradesh

Present infrastructure of Indian Meteorological Department (IMD), Govt is aimed at recording aimed that rainfall, humidity and temperature in different parts of Uttar Pradesh and is completely inadequate to forecast thunderstorm and squall. A brief account of the present infrastructure of instrument of Indian Metrological Department is given below:

#### 5.1.1 Automatic Weather Stations (AWS)

Automatic Weather Station are meant for measurement of wind speed, wind direction, temperature, humidity and pressure measurement and is the automatic version of traditional human labour intensive weather stations.

Presently only 01 automatic weather Station (AWS) is located in Uttar Pradesh at IMD, Lucknow.

### **5.1.2 Dense Pressure Tube (D.P.T)**

Dense Pressure Tube is meant for hourly or ½ hourly wind speed and direction. Presently Only two Dense Pressure Tube (D.P.Ts) are installed in Uttar Pradesh namely at Amausi Airport (Lucknow) and Babatpur Airport (Varanasi),

### **5.1.3 Radio Sonde & Radio Wind (RSRW)**

It has a balloon with a transmitter launched for measuring wind speed, direction, humidity and temperature. The timings of launching balloon are given below:

5.30 AM & 17.30  
0 GMT & 12 GMT

Presently only three Radio Sonde & Radio Wind instruments are installed in U.P. at Amausi Airport (Lucknow), Kundghat (Gorakhpur) and Babatpur Airport (Varanasi).

### **5.1.4 Pilot Balloon Observatories (PBOs)**

Pilot Balloon Observatories and meant for measuring wind direction and speed. Presently there are only four such PBOs in Uttar Pradesh. They are at Lucknow, Allahabad, Bareilly, Beharaich.

### **5.1.5 Part Time Observatories (PTOs):**

These are meant for temperature, humidity, pressure, wind, speed & direction measurements which are taken at 8.30 am in the morning and 17.30 hrs. in the evening. In Uttar Pradesh following part time observatories are located

### **Part Time Observations (PT) in UP**

1. Aligarh
2. Middha, Ballia
3. Barabanki
4. Churk-Sonbhadra
5. Etawah
6. Fatehgarh
7. Fatehpur
8. Ghazipur
9. Hamirpur
10. Hardoi
11. Lakhimpur Kheree
12. Kanpur
13. Meerut
14. Moradabad
15. Muzzaffarnagar

16. Najibabad
17. Shahjahanpur
18. Banda

### 5.1.6 Proposed infrastructure by IMD

Indian Meteorological Department (IMD) has proposed installation of following instruments in Uttar Pradesh.

- (i) 71 Automatic Weather Stations (AWS) in 71 districts of Uttar Pradesh in the 11<sup>th</sup> five year plan. Site selection for these stations is going on.
- (ii) Automatic Rain gauges at tehsil level are also proposed by IMD
- (iii) Installation of Doppler radar in Lucknow

## 5.2 Required technical and social preparedness

The infrastructure of Indian Meteorological Department (IMD), GoI discussed at above (5.1) inadequate to forecast thunderstorm and squall. The proposed installation of Doppler radar in Lucknow may help in forecasting thunderstorm and some extent (when recorded) only in eastern and central part of U.P.

### 5.2.1 Technical Preparedness

The necessary technical preparedness to forecast thunderstorm and or squall in Uttar Pradesh is elaborated below:

#### 5.2.1.1 Strengthening IMD infrastructure in Uttar Pradesh

State crises management group (SCMG) may request Government of India to allocate additional funds to India Meteorological Department to install following state of the art instruments for forecast of thunderstorm and squall.

- Installation of at least 04 lighting arresters and 02 doppler radars to cover the entire Uttar Pradesh as well as surrounding areas for forecasting of thunderstorm and or squall.
- Establishment of Observation Recording Stations and their two way connectivity with lighting arrester/Doppler radars for real time recording and with State Emergency Operation Centre, Lucknow for dissemination of near real time warning about squall or thunderstorm

#### 5.2.1.2 Strengthening State Government Machinery for strict adherence to norms laid down for erecting hoardings

- Formation of technical committee comprising building engineers from various departments to review the existing guidelines for erecting the hoardings and revising them with regard to the frequency of (thunderstorm and squall) and vulnerability in terms of the infrastructure

over which the hoarding will erected. (Implementing Agency: District Crisis Management Committee).

- Nagar Nigam/Municipality and district administration should ensure that no hoarding is erected by any government department or private company by violating the engineering guidelines in this regard. There is a harsh need to ensure strict adherence to the norms laid down with regards to the size, weight, material strength and site of the hoardings for various advertisements in order to avoid casualties due to falling of hoardings as result of squall or thunderstorm. Implementing Agency: Nagar Nigam/Municipality and District Administration)
- Budgetary provisions for more and more underground electricity and telephone lines.

### 5.2.2 Social Preparedness

Social Preparedness will include the following:

- Training of village level officials and workers of Department of Rural development and Revenue Department and members of PRIs to facilitate the creation of proper storage facilities for harvested crops.
- Sensitization of farmer community to initiate the community efforts for creation of proper storage facilities for harvested crops.
- Dissemination of information regarding appropriate technology for raising the hoardings along side roads and other public places.
- Training of NGOs, CBOs/ self help groups to help the community to create storage facilities.

### 5.3 Organizational and administrative preparedness.

This will include the following :-

#### 5.3.1 Formation of Crisis Management Groups/Disaster Management Committees at Regional, Macro and Micro Level

District Crisis Management Group (DCMG) at the district level, Tehsil Crisis Management Group (TCMG) at sub-division/ tehsil level should be formed with representatives of various line departments including Agriculture, Forest, BSNL, Electricity Board, Revenue, P.W.D, Health, Police and Fire Brigade. Village Disaster Management Committees (VDMCs) should also be formed at the village level comprising local villagers. This would certainly strength the local response to natural disaster including thunderstorm and squall.

#### 5.3.2 Emergency Expansion Plan for Hospitals and Health Centres

Emergency expansion plan for Civil Hospitals, Community Health Centres, PHCs and additional PHCs including, schemes for mobile medical teams for post-disaster situation should be in place.

Listing of hospitals of Army, Govt. (both Centre and State) and private hospitals and nursing homes in each district, should be done. Phone numbers of all these medical facilities should be available at District Control Room as well as in the State Emergency Operations Centre.

Prior reservation must be done, considering the hazard assessment and medicines like oxygen, saline water, OT and life-saving drugs should be kept ready. Vacant post of doctors and Para medical staff should be filled in all the government hospitals in order to make available the required number of medical workers at the time of emergency.

Time to time training of doctors and para medical staff on treating the victims of various natural disasters viz. thunderstorm and squall, earthquake, flood.

Assessing the nature and number of injuries the bed facility, medicines, oxygen, bottles of saline water, life-saving drugs and medical expertise should be made available at the time of need.

**5.3.3 Emergency Communication Systems** Planning, updation and mobilization of existing radio communication resources in emergency and acquisition of satellite phones to make them available at the Tehsil level to ensure prompt response not only in the event of an earthquake but for other disaster as well including thunderstorm and squall.

#### **5.3.4 Establishment of Crop Storage Building Centres**

Crop Storage Building Centres for harvested crops should be established to train masons on disaster resistant construction of storage facilities for harvested crops.

Thunderstorm and or squall causes great damage to crops including fruit crops and vegetable crops and is much different from other natural calamities due to its almost annual recurrence in one or other part of the state. We can reduce the suffering at the time of disaster if prior preparation, both physically and psychologically, has been done.

#### **5.3.5 Training of Functionaries**

- The state administration should arrange periodical training programme for all its concern functionaries and should also give instruction to all the District Administration for arranging training programmes for the concern department at their respective places. The trained officials should be interested to train other lower level officers and Panchayat representatives. Experts in different field may be invited to train the state and district level functionaries.
- Disaster Management Cell of U.P. Academy of Administration and Management, Lucknow shall train State and District Level Officers on various aspects of thunderstorm and squall disaster management.

#### 5.4 Inventory of human resources :

The Inventory of human resources may consist the following

- Names and addresses of principal functionaries, all concerned departments at the district level are to be kept in the State Emergency Operation Centre and District Control Room (DCR).
- Names and addresses of all key functionaries of all concerned departments at the district to be kept with the principal functionary of the department.
- List of equipment and stores for rescue and relief operations in each type of disaster and their availability at various places-private and government-be prepared and kept in the State Emergency Operation Centre and District Control Room (DCR) with the concerned department at the district level.
- Preparation of list of members of the community, NGOs and their members and elected representatives who could be helpful in management of the disaster.
- Setting of District Control Room (DCR) in the Collector's office and due publicity to it.
- Setting of similar control rooms in the offices of the principal functionaries of concerned department for coordination and action at their level.
- Identification of shelters and other facilities near the hazard prone areas for accommodating affected population.
- Identification of sites near the hazard prone areas for setting temporary control rooms for rescue and relief operation.
- Establishing a coordination mechanism for incoming relief material and teams from outside at their possible places of disembarkation and deploying them in affected areas in a planned manner.
- Preparation of alternate communication arrangements in case of conventional communication channels fails.
- Inventory of transport – public and private - available for deployment in times of emergency including names and addresses of owners, drivers, mechanics and repair workshops and fuel depots.
- Preparation of the community especially in the disaster prone areas.
- Identification of manpower for manning the DCR and other control rooms and allocation of duties.
- Arrangement for training of all identified functionaries and periodic upgrading of their knowledge.

## 5.5 Role of State Government Departments/Agencies in Disaster Management

### General Preparedness

Each Department and Govt. agency involved in Disaster Management and mitigation will:

- Designate a Nodal officer for emergency response and will act as the contact person for that department / agency.
- Ensure establishment of failsafe two-way communication with the State, District and other emergency control rooms and within the organization
- Work under the overall supervision of the SRC / the district Collectors during emergencies.

### (i) Role and Responsibilities of Fire Brigade in Thunderstorm and Squall Disaster Management

#### Prevention Activities

- Identification of pockets, industrial, residential and commercial area which may witness fires in the event of squall.
- Ensuring strict adherence to fire safety norms in the buildings with punitive action the owners of the buildings having hanging, loose or open electricity wires may cause short circuiting.
- Educate people to adopt fire safety measures in the immediate aftermath of squall.
- Conduct training and drills for use of various fire protection and preventive systems in order to ensure higher level preparedness in the community.
- Training the communities to handle fire emergencies more effectively in the immediate aftermath of an earthquake or squall.

#### Response Activities:

- Rescue of persons trapped in burning, collapsed or damaged buildings, damaged vehicles, including motor vehicles, trains and industries, boilers, trenches and tunnels
- Control fires and minimize the resultant damages.
- Protection of property and the environment from fire damage.
- Support to other agencies in the response to emergencies.
- Investigation into the causes of fire and assist in damage assessment

**(ii) Role and Responsibilities of Health Department in Disaster Management including the management of Thunderstorm and Squall**

**Preparedness Activities**

- Assess preparedness levels at State, District, Block and village level.
- Formation of adequate number of mobile units with trained personnel, testing facilities, communication systems and emergency treatment facilities.
- Identification of safe locations in probable disaster sites for emergency operation camps.
- Promoting and strengthening Primary Health Centres with network of para-professionals to improve the capacity of surveillance and control of epidemics
- Identification of areas endemic to epidemics and natural disasters.
- Awareness generation about do's and don'ts regarding first aid to victims in the immediate aftermath of a thunderstorm or squall.
- Training of members Village Disaster Management Committees and NGOs on first aid to disaster victims. Every month members of two Village Disaster Management Committees from each block of a district can be trained by the District Hospital or by one of the Community Health Centres on first aid to disaster victims. This may lead to the raising of 24 Village Disaster Management Committees in each block every year, which are trained in first aid to disaster victims.
- Training of field personnel, Traditional Birth Attendants, community leaders, volunteers, NGOs and CBOs in first aid, measures to be taken to control outbreak of epidemics during and after a disaster, etc.
- Arrangement of standby generators for every hospitals
- Listing of vehicles, repair of departmental vehicles that will be requisitioned during emergencies for transport of injured.
- Listing and networking with private health facilities

**Response activities:**

- Ensure adequate availability of personnel at disaster sites
- Planning for making prior arrangements for early transfer of patients who need specialized care/treatment
- Disinfection of water sources
- Opening up of site operation camps in the affected areas.
- Immunization and Quarantine, if necessary .



- Early transfer of patients who need specialized care/treatment
- Establishment of public information centres with appropriate and modern means of communication, to assist providing information to patients, their families, other people living in epidemic affected areas regarding vaccination, Do's and Don'ts treatment facilities, etc.
- Monitoring of water and food quality and disposal of waste in transit and relief camps, feeding centres and affected areas
- Stock piling of life-saving drugs, de-toxicants, anesthesia, Halogen tablets in vulnerable areas
- Situational assessment and reviewing the status of response mechanisms in known vulnerable pockets
- Regular reporting to the control rooms
- Review and update precautionary measures and procedures, and apprise the personnel who will be implementing those.
- Disinfections of water bodies and drinking water sources.
- Immunization against infectious diseases
- Ensure continuous flow of information

#### **Recovery Activities**

- Identification of appropriate locations and setting up of site operation camps for combating epidemics.
- Continuation of disease surveillance and monitoring
- Continuation of treatment, monitoring and other epidemic control activities till the situation is brought under control and the epidemic eradicated
- Trauma counseling.
- Treatment and socio-medical rehabilitation of injured or disabled persons
- Immunization and nutritional surveillance
- Long term plans to progressively reduce various factors that contribute to high level of vulnerability to diseases of population affected by disasters
- Establishing procedures and methods of coordination with the Health Department, other local authorities/departments, NGOs to ensure that adequate prevention and preparedness measures have been taken to prevent and /or minimize the probable outbreak of epidemics.

**(iii) Role and Responsibilities of Animal Husbandry Department in Disaster Management including the Management of Thunderstorm and Squall**

**Preparedness Activities**

- Listing of animal population with category
- Stock piling of emergency medicines and medical equipments
- Listing and identification of vehicles to be requisitioned for transport of injured animals
- Vaccination of the animals and identification of campsites in the probable sites
- Promotion of animal insurance
- Tagging of animals
- Arrangement of standby generators for veterinary hospitals
- Provision in each hospital for receiving large number of livestock at a time
- Training of community members in carcasses disposal
- Stock piling of water, fodder and animal feed
- Stock-piling of surgical packets
- Construction of mounds for safe shelter of animals.
- Identification of various water sources to be used by animals in case of prolonged hot and dry spells

**Response Activities**

- Ensure adequate availability of personnel and mobile team
- Eradication and control of animal diseases, treatment of injured animals
- Protection of abandoned and lost cattle
- Supply of medicines and fodder to affected areas
- Disposal of carcasses ensuring proper sanitation to avoid outbreak of epidemics
- Establishment of public information centre with a means of communication, to assist in providing an organised source of information.
- Mobilising community participation for carcass disposal

**Recovery Activities**

- Assess losses of animals assets and needs of persons and communities

- Play a facilitating role for early approval of soft loans for buying animals and ensuring insurance coverage and disaster-proof housing or alternative shelters/mounds for animals for future emergencies
- Establishment of animal disease surveillance system

**(iv) Role and Responsibilities of Agriculture Department in Disaster Management including the Management of Thunderstorm and Squall**

**Preparedness Activities**

- Listing of the crops damaged due to thunderstorm/squall
- Promotion of crop insurance
- Construction of thunderstorm safe crop storage shelters for farmers within the crop fields or in the vicinity.
- Mobilising community participation for construction of thunderstorm safe crop storage shelters within the crop fields.

**Recovery Activities**

- Assessment of damage to crops.
- Supply of seeds & other essentials.
- Providing services of technically qualified staff.
- Play a facilitating role for early approval of agriculture loans and ensuring insurance coverage for the crop damages and disaster-proof shelters for the harvested crop to overcome the future emergencies

**(v) Role and Responsibilities of Jal Sansthan/ Nagar Nigam/ Municipality/ Gram Panchayat) in Disaster Management including the Management of Thunderstorm and Squall**

**Preparedness Activities**

- Provision of safe water to all habitats
- Prior arrangement of water tankers and other means of distribution and storage of water
- Prior arrangement of stand by generators
- Adequate prior arrangements to provide water and halogen tablets at identified sites to be used as relief camps or in areas with high probability to be affected by natural calamities
- Raising of tube-well platforms, improvement in sanitation structures and other infrastructural measures to ensure least damages during future disasters

- Clearance of drains and sewerage systems, particularly in the urban areas.

**Response Activities:**

- Disinfections and continuous monitoring of water bodies
- Ensuring provision of water to hospitals and other vital installations
- Provision to acquire tankers and establish other temporary means of distributing water on an emergency basis
- Arrangement and distribution of emergency tool kits for equipments required to dismantle and assemble tubewells, etc.
- Carrying out emergency repairs of damaged water supply systems

**Recovery Activities:**

- Strengthening of infrastructure
- Review and documentation
- Sharing of experiences and lessons learnt
- Training to staff
- Development of checklists and contingency plans

**(vi) Role and Responsibilities of Police Department in Disaster Management including the Management of Thunderstorm and Squall**

**Preparedness and Preparedness Activities**

- Keep the force in general and the PAC in particular fighting fit for search, rescue, evacuation and other emergency operations at all times through regular trainings and mock drills.
- Procurement and deployment of modern emergency equipments while modernising existing infrastructure and equipments for disaster response along with regular training and drills for effective handling of these equipments
- Ensure that all communication equipments including wireless are regularly functioning and deployment of extra wireless units in vulnerable pockets
- Keeping close contact with the District Administration & District Control Room.
- Organise training programmes on search, rescue and evacuation for the members of the Ward and Village Disaster Management Committees and NGOs for Search and Rescue of victims of natural disasters.

**Response Plan:**

- To take up search, rescue and evacuation operations in coordination with the administration, locals, NGOs and volunteers.
- Security arrangements for relief materials in transit and in camps etc.
- Emergency traffic management particularly the arrangement for the safe passage to the ambulances carrying the injured persons.
- Maintenance of law and order in the affected areas.
- Assist administration in taking necessary action against hoarders black marketers in the event of severe damage of crops.

**(vii) Role and Responsibilities of Energy Department in Disaster Management including the Management of Thunderstorm and Squall**

**Preparedness Activities**

- Identification of materials/tool kits required for emergency response
- Ensure and educate the minimum safety standards to be adopted for electrical installation and equipments and organise training of electricians accordingly
- Develop and administer regulations to ensure safety of electrical accessories and electrical installations
- Train and have a contingency plan to ensure early electricity supply to essential services during emergencies and restoration of electric supply at an early date
- Develop and administer code of practice for power line clearance to avoid electrocution due to broken / fallen wires.
- Strengthen high-tension cable towers to withstand high wind speed, flooding and earthquake, modernise electric installation, strengthen electric distribution system to ensure minimum damages during natural calamities
- Conduct public/industry awareness campaigns to prevent electric accidents during normal times and during and after a natural disaster

**(viii) Roles and Responsibilities of Civil Defense in Disaster Management including the Management of Thunderstorm and Squall**

**Preparedness Activities**

- Organise training programmes on first aid, search, rescue and evacuation for its personnel in order to improve their skills.

- Preparation and implementation of first aid, search and rescue service plans for combating disasters including thunderstorm and squall.
- Remain fit and prepared through regular drills and exercises at all times.
- Organize training programmes on search, rescue and evacuation of victims of natural disasters and accidents for the members of the Ward and Village Disaster Management Committees and NGOs.

**Response Activities**

- Act as support agency for provision of first aid, search and rescue services to other emergency service agencies and the public
- Act as support agency for movement of relief
- Triage of casualties and provision of first aid and treatment
- Work in coordination with medical assistance team
- Help the Police for traffic management and law and order

**(ix) Role and Responsibilities of Public Works Department in Disaster Management including the Management of Thunderstorm and Squall**

**Preparedness Activities**

- Keep a list of earth moving and clearing vehicles / equipments (available with Govt. Departments including the near by project site of National Highway Authority , PSUs, and private contractors, etc.) and formulate a plan to mobilize those at the earliest.
- Inspection and emergency repair of roads/ bridges, public utilities and buildings

**Response Activities**

- Clearing of roads and establish connectivity. Restore roads, bridges and where necessary make alternate arrangements to open the roads to traffic at the earliest.
- Mobilisation of community assistance for clearing blocked roads
- Facilitate movement of heavy vehicles carrying equipments and materials.
- Identification and notification of alternative routes to strategic locations.
- Filling of ditches, disposal of debris, and cutting of uprooted trees along the road.

- Arrangement of emergency tool kit for every section at the divisional levels for activities like clearance (power saws), debris clearance (fork lifter) and other tools for repair and maintenance of all disaster response equipments.
- Development of checklists and contingency plans.

### **Recovery Activities**

- Strengthening and restoration of infrastructure with an objective to eliminate the factor(s) which caused the damage
- Review and documentation
- Sharing of experiences and lessons learnt

### **Response Activities:**

- Disconnect electricity after receipt of warning
- Attend sites of electrical accidents and assist in undertaking damage assessment
- Standby arrangements to ensure temporary electricity supply
- Inspection and repair of high tension lines /substations/transformers/poles etc
- Ensure the public and other agencies are safeguarded from any hazards, which may have occurred because of damage to electricity distribution systems
- Restore electricity to the affected area as quickly as possible
- Replace / restore of damaged poles/ salvaging of conductors and insulators

### **(x) Role and Responsibilities of Forest Department in Disaster Management including the Management of Thunderstorm and Squall**

#### **Preparedness activities**

- Promotion of shelter belt plantation.
- Provision of seedling to the community and encourage plantation activities, promoting nurseries for providing seedlings in case of destruction of trees during natural disasters.
- IEC activities for greater awareness regarding the role of trees and forests for protection during emergencies and also to minimize environmental impact due to deforestation like climate change, soil erosion, etc.
- Increasing involvement of the community, NGOs and CBOs in plantation, protection and other forest protection, rejuvenation and restoration activities.

**Response Activities**

- Assist in road clearance
- Provide of tree cutting equipments
- Provide of building materials such as bamboos etc for construction of shelters

**Recovery Activities**

- Take up plantation to repair the damage caused to tree cover and provide employment to the members of affected families.

**(xi) Role and Responsibilities of Food & Civil Supplies Department in Disaster Management including the Management of Thunderstorm and Squall**

**Preparedness Activities**

- Construction and maintenance of storage godowns/ warehouses at strategic locations.
- Stock piling of food reserves and essential commodities in anticipation of disaster.
- Details of each of the warehouse connected to the base ware house and its distance from the base warehouse, capacity in number of bags. Similarly detailed database of all the public distribution shops connected to each of the warehouse and distance of each of the public distribution shop from the warehouse and capacity in number of bags. As this information can be utilized for safely stockpiling the food grains received from various sources in the immediate aftermath of a disaster.
- Take appropriate preservative measures to ensure that food and other relief stocks are not damaged during storage, especially precautions against moisture, rodents and fungus infestation.

**Response Activities**

- Management of procurement
- Management of material movement in close coordination with Transport department and Railways for transportation of relief supplies.
- Inventory management
- Take necessary action against hoarders black marketers in the event of severe damage of crops.



**(xii) Role and Responsibilities of Irrigation Department in Disaster Management including the Management of Thunderstorm and Squall**

**Preparedness Activities**

- Identify flood prone rivers and segments of embankments along such segments (of rivers) which may witness seepage and or overflow of flood water in the event of a thunderstorm and torrential rains. Strengthening of such segments of embankments which are prone to flooding and formulation of emergency plans for such areas should be some of the priorities of Irrigation Department .
- Identification and maintenance of materials/tool kits required for emergency response cracking or breaching of embankments in the event of a disaster.
- Stock-piling of sand bags and other necessary items for breach closure.
- Development of checklists and contingency plans

**Response Activities**

- Inspection of bunds of dams, irrigation channels, bridges, culverts, control gates and overflow channels in the immediate aftermath of thunderstorm and torrential rains..
- Monitoring and protection of irrigation infrastructures
- Monitoring flood situation in the immediate aftermath of incessant rains or thunder storm and dissemination of flood warning
- Inspection and repair of pumps, generator, motor equipments, station buildings
- Community mobilization in breach closure

**Recovery Activities**

- Strengthening of infrastructure and human resources
- Review and documentation
- Sharing of experiences and lessons learnt

**(xiii) Role and Responsibilities of Panchayati Raj Department in Disaster Management including the Management of Thunderstorm and Squall**

**Preparedness Activities**

Develop prevention/mitigation strategies for risk reduction at community level by following measures:

- Training of elected representatives on various aspects of disaster management.

- Public awareness on various aspects of disaster management through training programs to be organized at the Gram Panchayat level on pre during and post thunderstorm/squall do's and don'ts.
- Facilitate the Village Disaster Management Committees of the areas the in preparing their community disaster management plans for natural disasters including thunderstorm/squall .
- Support strengthening response mechanisms at the Gram Panchayat level (e.g., better communication, local storage, search & rescue equipments, etc.)
- Ensure alternative routes/means of communication for movement of relief materials and personnel to marooned areas or areas likely to be marooned.
- Time to time clearaning of blocked drains.
- Assist all the government departments to plan and prioritize prevention and preparedness activities while ensuring active community participation

### **Response Activities**

- Encourage Gram Panchayat Members and support for timely and appropriate delivery of warning to the community.
- Clearance of blocked drains and roads, including tree removal in the villages.
- Construct alternative temporary roads to restore communication to the villages.
- Identify the school building, community centres and operationalise them into emergency relief centres and emergency shelters.
- Make necessary for Sanitation, drinking water and medical aid.
- Participate in post impact assessment of emergency situation
- Support in search, rescue and first aid activities.

### **Recovery Activities**

- Provision of personal support services e.g. Counselling
- Repair/ restoration of infrastructure e.g. roads, bridges, public amenities
- Supporting the Gram Panchayats in development of storage houses for food stocks.
- Coordination for distribution of relief and rehabilitation materials.
- The Panchayat Samity and Gram Panchayat members to be trained to act as an effective interface between the community, NGOs, and other developmental organisations
- Provide training so that the elected representatives can act as key functionaries for reconstruction and recovery activities.

**(xiv) Role and Responsibilities of Information & Public Relations Department in Disaster Management including the Management of Thunderstorm and Squall**

**Preparedness Activities**

- Creation of public awareness regarding various types of disasters including earthquakes through media propagation.
- Dissemination of information to public and others concerned regarding do's and don'ts of various disasters including thunderstorm/squall.

**Response Activities**

- Setting up of a control room to provide authentic information to public regarding impending emergencies
- Keep the public informed about the latest of the emergency situation (area affected, lives lost, etc)
- Keep the public informed about various post disaster assistances and recovery programmes

**5.6 Community-Based Disaster Preparedness Plan**

Preparedness in disaster management requires systematic and comprehensive planning at the national, state, district and village levels. *Uniyal (2003)*. Plans, are generally formulated at the national, state, district and village levels. But the emphasis presently is to reach out to the community at the grass roots level and hence community-based disaster preparedness plans are being advocated. The objective of this effort is to strengthen the capacities of people and institutions at community level to face disasters. The plans are prepared with the involvement of community as they can better identify the existing resources, hazards they are exposed to prevailing infrastructure, resources, copying mechanisms etc. Hence preparedness plan needs to take cognizance of different types of activities needed at various stages of disaster management. The community-based disaster preparedness requires performance of several types of activities at three different stages i.e., pre-disaster, during-disaster and post-disaster. Those activities are to be identified which can be reflected in the preparedness plan.

**5.6.1 Community-based Preparedness in Pre-disaster Phase**

- a) Orienting the community towards the nature and effects of the disasters to which they are vulnerable.
- b) Taking stock of the resources of the community such as schools, primary health centres, cyclone shelter, communication facilities, roads and other infrastructure and skilled individuals.
- c) Assessing the risks and vulnerabilities of the community. The various elements at risk that include the physical structures, as well as the

vulnerable sections of the community such as women, children, physically challenged, old, etc., need to be examined so that the preparedness measures are appropriately planned.

- d) Uniyal & Prasad (2006) recommended establishment of Community Radio Clubs and involvement of members of Village and Block Disaster Management Committees for providing inputs for the programmes to be telecast from these Community Radio Clubs on disaster preparedness, response and mitigation in local dialect in the disaster prone areas of Uttar Pradesh. They further suggested establishment of HAM radio clubs for emergency communication. The same may be suggested for Uttar Pradesh, as there is a harsh need for awareness and sensitization programmes (on disaster management) to be broadcast/telecast through Community Radio Clubs /local channels. Furthermore HAM Radio clubs should be encouraged in the remote parts of Uttar Pradesh for emergency communication. Community Radio Clubs and HAM radios are already becoming popular in some parts of our country.
- e) Formulating preparedness plan at the community level, that takes into cognisance the community needs, measures to be taken by the community before, during and after the disaster strikes, resources available at various places, clear allocation of responsibilities amongst all concerned officials, departments, Panchayati Raj Institutions, NGOs, CBOs etc. A properly prepared plan facilitates the community to effectively execute the plan.
- f) Specifying the role of community in handling the disaster.

### **5.6.2 Community-based Preparedness During –disaster**

- a) Organising Search, Rescue and Evacuation activities. This includes identifying the disaster victims, bringing them to safer places, provision of first aid, distribution of relief, adhering to evacuation plan etc.
- b) Providing shelter for people as well as livestock. This includes arrangements for water supply, sanitation, kitchen, fodder for animals, medical services and first aid etc.
- c) Clearing of debris from collapsed buildings, bridges, trees, other structures, reestablishing of transport and communications services.
- d) Moving of injured to the nearby health centres and hospitals.
- e) Disposing of dead humans in order to contain spread of diseases is another important task. Identification of dead bodies, compliance with police formalities, mobilizing resources for disposal of bodies in accordance with religious and cultural practices, are activities which involve the community. Disposal of dead animals is important as it has effect on health and environment.

- f) Assessing damages immediately on the occurrence of disaster facilitates quick emergency relief. This is to be done with reference to the number of households, population, livestock, area affected etc.

### **5.6.3 Community-based Disaster Preparedness in Post-disaster Phase**

- a) Undertaking a detailed damage assessment covering verified number of human lives, identification of live victims as well as the dead, livestock, infrastructure, damage to crops and the estimated value.
- b) Drawing up a comprehensive economic rehabilitation plan that includes restoration of agricultural activity through necessary inputs, rehabilitation of artisans, marginal, small scale and business people, those pursuing other occupations, replacement of cattle, agricultural and other equipment, boats, fishing nets etc.
- c) Ensuring social rehabilitation through strengthening of existing health centres, schools, aganwadis, community centres, vocational training centres, psychological counselling to the affected to enable them get back to their normal routine.
- d) Building an appropriate monitoring and evaluation mechanism in community based disaster preparedness programme. This is needed to facilitate proper utilization and implementation of resources.

Community-based disaster preparedness is essential to assess the damages arising out of disaster, determine the extent and type of assistance. A community based disaster preparedness plan is a comprehensive action plan which specifies the demographic profile, resources available with the community, measures to be taken before, during and after the occurrence of disaster. It is said to contain an inventory of several types of resources available at the community level, roles and responsibilities of different administrative agencies, Panchayati Raj Institutions, NGOs, CBOs and community.

## **5.7 Aspects of Community-based Disaster Preparedness Plan**

A Community-based Disaster Preparedness Plan, broadly is to indicate the following aspects:

- Village profile
- Profile/information about the community
- Disaster profile
- Inventory of resources of the community
- Emergency communication procedures
- Specific roles and responsibilities (of different agencies and functionaries)

### 5.7.1 Components of Community-based Disaster Preparedness Plan Pre-disaster Phase

- Risk assessment and vulnerability analysis
- Resource analysis and mobilization
- Warning system and its dissemination
- Organizing community response mechanisms
- Construction and maintenance of shelters and community storage facilities for harvested crops.
- Mock exercises and drills
- Strengthening of community self-help capacities
- Specification of roles and responsibilities of various functionaries and agencies. (Panchayati Raj Institutions (PRIs), Government functionaries, NGOs, Police, Primary and District Health Centre, Disaster Task Force and Community)

#### During-disaster Phase

- Search, Rescue and Evacuation
- Shelter for disaster affected (community as well as livestock)
- First aid and other medical support
- Clearance of debris
- Restoration of communication system or use of alternative communication system
- Disposal of Dead
- Relief distribution
- Property security and public safety
- Immediate damage assessment
- Information, Education and Communication (IEC) and training
- Role of various functionaries and agencies. (PRIs, Government functionaries, NGOs, Police, Primary and District Health Centres, Disaster Task Force and Community)

#### Post-disaster Phase

- Damage and needs assessment
- Psychological support to the victims
- Restoration of lifeline support
- Agricultural, economic and social rehabilitation
- Information, Education and Communication and training
- Role of various functionaries and agencies.

- (PRIs, Government functionaries, NGOs, Police, Primary and District Health Centres, Disaster Task Force and Community)

### **5.7.2 Operationalization of Community-Based Disaster Preparedness Plan**

#### **Key Strategies**

Uniyal (2008), suggested participatory rural appraisal for preparedness and mitigation of some of the natural disasters. The operationalising of community-based disaster preparedness plan requires the active participation of local communities. it involves:

- Generating awareness amongst the members of community regarding the vulnerabilities and risks involved in several types of disasters. This also needs the utilisation of traditional wisdom that is already available with the people.
- Propagating community participation vigorously at grass roots levels, as most of the actions are needed at the individual or community levels. The governments have limited resources. Hence participation enables people to strive towards self-reliance instead of excessive dependence. Community participation helps in identification and prioritising problem areas and generates solutions.
- Organising local people in disaster task forces, disaster management committees, and groups for dissemination of warnings, search, rescue and evacuation teams etc.
- Sensitising the Panchayati Raj Institutions towards formulating community-based disaster preparedness plans and integrating them with the district and State plans.
- Involving development workers in eliciting community participation. The community can identify their formal and non formal leaders with their help and guidance.
- Constituting Disaster Response Organization at the community level. Zubair (2003) suggests formation of such an organization, which can be entrusted the designing and sharing of Counter Disaster Plan with all community members. A Counter Disaster Plan or a Community Level Contingency Plan helps to consolidate the community's efforts to prepare for hazards. The plan provides guidelines for operation and clarifies the roles and responsibilities of all concerned before, during and after the occurrence of disasters.
- Mobilising local assets, resources etc., of the community. This can include traditional wisdom, folklore, traditional capability of comprehending disaster/hazard warning signals etc. Constitution of Community Disaster Preparedness Team can make a difference in implementation of Disaster Preparedness Plan. For instance, in the recent tsunami, training members of local disaster relief committee of

Samiyarpettai of Chidambaram Taluk of Cuddalore district, In Tamil Nadu enabled them carrying out rescues operations, giving first aid to victims, organizing distribution of relief materials etc. (The Hindu, 2005).

The operationalising of community based disaster preparedness plan can be entrusted to PRIs, disaster task force members, trained volunteers etc. The community based strategies are yielding significant results. For instance, the Bangladesh Red Crescent has trained village volunteers working in coastal district who are equipped with preparedness skills. In Orissa, a long established NGO, Gram Vikas has been working with tribal people. Its Rural health and Environment Programme (RHEP) premised on community ownership of processes and outputs, focuses on shelter, sanitation and drinking water. Its approach in the wake of Orissa super cyclone created a community able to revive its day to day life within days of the cyclone impact ) [www.odihpn.org/report](http://www.odihpn.org/report)).

Community based disaster preparedness goes much further than traditional disaster management in focusing on locally specific vulnerabilities, coping strategies and resilience. However, in practice, CBDP approaches have tended to address the symptoms of vulnerability rather than its root causes. Ensuring that disaster mitigation and preparedness measures are both appropriate and sustainable will require rooting vulnerability reduction within a wider developmental approach. Some recommendations, in this regard, according to International Federation of Red Cross (IFRC), which is based on its field research in the Philippines include:

- Analysing the root causes of vulnerability to disaster
- Understanding the strengths of local livelihoods and capacities
- Listening to community perspectives and priorities
- Including others actors from the start so that the burden of risk reduction can be shared
- Advocating issues that the community itself cannot tackle; and
- Promoting the integration of risk reduction into development planning. (World Disasters Report, 2004).

The key ingredients of disaster management with a community perspective. These include:

- Clearly defined and agreed criteria for the identification, selection and verification of the most deserving beneficiaries.
- Emphasis on greater involvement and decision-making by women within the organisation, among volunteers and beneficiaries and in the community.
- Priority for the weakest and most vulnerable people.
- Strong local contribution.



- Conscious focus on livelihood-based programme input provides long-term and sustainable benefits to the community and at the same time increases the commitment and feeling of solidarity between the community and the workers.
- Right inputs to be given at the right time.
- Planned cooperation with all government and non-government agencies whenever such collaboration adds value and increases the effectiveness of the NGO.
- Strategic planning and coordination to bring together forces and resources to achieve optimum results.
- Using small inputs to achieve big and lasting impact, eg., using food for work programme to rebuild livelihood assets or providing paddy seeds at sowing time so that poor farmers do not fall into the clutches of money lenders.

## **5.8 Police, Paramilitary Forces, Armed Forces, NGOs & Youth Organisations:**

An important aspect of capacity building is updating, training, rehearsals, and mock drills simulation various line manpower of departments , paramilitary, armed forces youth organizations, NGOs and CBOs altogether form valuable human resources.

### **5.8.1 Police**

The responsibility for maintaining law and order, and almost all routine policing is carried out by state-level police forces. The central government participates in police operations and organization by authorizing the maintenance of the Indian Police Service. The state level police forces are separate but their patterns of organization and operation are similar.

In most states and territories, police forces are functionally divided into civil (unarmed) police and armed contingents. The former staffs are attached to police stations, conduct investigations, answer routine complaints, perform traffic duties, and patrol the streets. Those states that maintain district armed contingents employ them as a reserve strike force for emergencies. Such units are organized either as a reserve strike force for emergencies. Such units are organized either as a mobile armed force under direct state control or in the case of district armed police as a force directed by district superintendents and generally used for riot-control duty. The provincial Armed constabulary is an armed reserve maintained at key locations in some states and active only on orders from the higher-level authorities. Armed constabulary are assigned to VIP duty or assigned to maintain order during fairs, festivals, athletic events, elections and natural disaster.

## **Role of Police in Disaster Response**

The police play a critical role in disaster situations as all incidents are covered by them. Police is mobilized to reach the site of disaster immediately with a view to carry out relief and rescue operations and is the initial coordination agencies. It is also the responsibility of the police to maintain security along with law and order at disaster locations where there might be chaos and miscreants may take advantage of the situation. Police personnel deployed for such relief operations prevent commission of cognisable offences including all offences against property; human body and public tranquillity. The police communication system is made available for transmission and receipt of messages in connection with disasters. They also regulate movement of victims, rescue and relief, medical assistance and supplies.

### **5.8.2 Fire services**

Managing fires is more technical than perceived. It needs comprehensive study in risk mapping plans for each zone, study of preparedness level in terms of special equipment and training of personnel, fool proof communication system and periodic mock drills. The role for the fire services is not just limited to fire fighting only but it also plays the role of a disaster management agency especially in urban areas. It can provide basic search and rescue service and can also coordinate in event of a disaster situation with other agencies like the police and health services.

The fire brigade had a heterogeneous character and are administered by the States and union territories as fire is a state subject. The ministry of home affairs renders technical advice to states and union territories and the central ministries on fire protection, fire prevention and fire legislation. The National fire service college, Nagpur conducts different types of courses for the training of fire officer of several countries. There is a standing fire advisory council to examine the technical problems related to the fire services and also to formulate a national fire code. These codes should be based on the laid down technical specification and include the relevant portion of existing fire prevention and fire safety practices that exist in various act and regulations.

There is a requirement of a model fire service bill should include:-

- Force Structure under state government with provision for appointment and personnel.
- Expedites to include levy of fire tax and fees for services red.
- Fire fighting property- acquisition
- Penalties for violation
- Miscellaneous- Training, liability, information, water requirement.

### **5.8.3 Central Police Forces/ Para Military Forces**

The role of para military forces (PMF) is similarly important as they may be called upon for additional assistance in situations requiring greater assistances from outside. Indian Paramilitary Forces are those agencies which act as armed forces auxiliaries. The PMP is made up of the following twelve organizations:

- Central Industrial Security Force
- Central Reserve Police Force
- Rapid Action Force
- Indo Tibetan Border Police
- Rashtriya Rifles
- Defence Security Corps
- Railway Protection Force
- Indian Home Guard
- Civil Defence
- Assam Rifles
- Border Security Force
- State Armed Police
- Special Security Bureau

### **5.8.4 Ex-serviceman**

A large number of disciplined and trained men are available in all parts of the country after having retired from the Armed Forces. Amongst these men are people trained and experienced in different aspects who could be the key persons at local for disaster management. They have qualities of leadership, skills, expertise and dedication for community work. The Director General Resettlement formulates and implements scheme for their resettlement with the Soldiers, and Airmen Board functioning under it and having its branches in all states and districts of the country. The ex-servicemen must be involved at the local in the planning and implementation of disaster management activities within a district.

### **5.8.5 Youth Organizations**

Youth movement is critical component of the education system that can play an important role in the area of disaster management. The following institutions have capability potential, and are very suitable for disaster management.

- i) The National Cadet Corps (NCC)
- ii) Bharat Scouts & Guides

- iii) National Service Scheme (NSS)
- iv) Nehru Yuvak Kendra (NYK)

NCC, boy scouts and the Girls Guides, NS and such organized youth should include Disaster Management as one of their main activities. They could be incorporated into the local level relief and awareness programme. NYK, Youth Clubs and Mahila Mandals as the grass root level to be organized for creating a mass movement for disaster preparedness.

#### **5.8.5.1 National Cadet Corps**

The NCC came into existence on the 16<sup>th</sup> July, 1948 under the NCC Act XXI of 1948 under the Ministry of Defence with the following objectives:

- i) To develop character, comradeship, ideals of service and capacity for leadership in the youth of the country.
- ii) To stimulate interest in the defence of the country by providing service training to youth; and
- iii) To build up a reserve to enable the Armed Forces to expand rapidly in a national emergency.

The NCC curriculum was extended to include community development as part of the NCC syllabus. Its broad activities are institutional training, community development youth exchange programme, sports and adventure training. All the activities of NCC tend to develop a trained and disciplined manpower to help the country in the eventuality of disaster emergency. NCC can play an important role in Disaster Management due to the followings:

- i) The physical fitness, including their participation in adventure, sports and games to make them eminently and suitably for assisting the country in such situation.
- ii) Activities to shape defence force aims and objectives. As armed forces are sometimes required to work in disaster management area, the NCC also tries to give some similar inputs to NCC Cadets, and
- iii) Some training inputs are there in their activities which enable them to provide first aid services.

#### **5.8.5.2 Bharat Scouts & Guides**

The Boy scouting and the girls guiding as movement started in India in 1909 and 1910 respectively. Now they are known as the Bharat Scouts & Guides with the objectives to:

- i) Make boy scouts and girl guides resourceful, self reliant and ever helpful towards others.
- ii) Enable them discover their latent faculties and talents.
- iii) Enable them to express them creatively.

- iv) Promote character building spirit of adventure and spirit of service amongst the youth.

These activities are not only recreational to students but also develop endurance, build competencies to survive in difficult situations and provide opportunities to serve the society. Thus, it is seen that major emphasis in their training is on resourcefulness, self reliance, character building and service to the community. Since the age of the scouts and guides is usually below 16, they have the idealism in themselves and a very good material to develop right type of attitudes and also some skills such as first aid, providing relief, especially when it comes to distribution of food and other relief material to the victims of disaster. However there is a need to focus on those activities that enable them to become effective disaster management volunteers specially in strengthening communication network and in certain cases even in the rescue work.

### **5.8.5.3 National Service Scheme**

National Service scheme was introduced in India in a formal way in 1969 with the central theme the students should always keep before them their responsibility. The Nationality policy on education 1986 has recognized the role of NSS in serving the community. The main objectives of NSS are:

- i) Understand the community in which they work
- ii) Understand themselves in relation to their community
- iii) Identify the needs and problems of the community and involve themselves in problem solving process.
- iv) Develop among them a sense of social and civic responsibility.
- v) Utilize their knowledge in finding practical solution to individual and community problems
- vi) Develop competence require for group living and sharing of responsibility.
- vii) Gain skills in mobilizing community participation
- viii) Acquire leadership qualities and democratic thoughts
- ix) Develop capacity to meet emergencies and natural disasters, and
- x) Practical national integration and social harmony.

The NSS programme may be classified into regular NSS activities and special programmes. Its broad activities are:

- i) Environment enrichment and conservation
- ii) Health family welfare and nutrition programme
- iii) Programmes aimed at creating an awareness for improvement of the status of women
- iv) Social service programmes

- v) Production oriented programmes
- vi) Relief and rehabilitation work during natural calamities
- vii) Education and recreation

#### **5.8.5.4 Nehru Yuvak Kendra**

Now one of the largest grass root level organization of its kind in the world, NYKS was established to harness and channelise the power of youth on the principles of voluntarism, self help and participation. On the present reckoning youth in India forms nearly 35% of the total population which has already crossed 1 billion mark. India youth also account for 35.8 per cent of the world's total youth population. This is a vital vibrant and dynamic human resources having bearing on the future state of not only India but the also the entire world.

The Nehru Yuva Kendra Sangathan has 500 district offices, 46 regional offices 18 zones 1000 youth development centers and over 181 thousand village based youth clubs enrolled under it. The purpose behind these clubs at the grass root level is to form village level voluntary action groups of youth that may come together with concern for the poorest of the poor.

NYKS' strength lies in 5000 national service volunteers and nearly 8 million youth volunteers through a vast network of Youth clubs and Mahila Mandals at the grass root level. Through NYKS these village based organizations have become local pressure groups as well as catalytic agents for socia-economic, cultural, political and environmental transformation. These groups have in fact become functional action groups with rural sustainability and self reliance as their hallmark. When viewed in these terms, the role of NYKS could be defined as that of not merely an ogranization but a mass movement that can play an important role in disaster management (IGNOU, 2006).

#### **5.8.6 Media**

Reducing the losses in life and property caused by disasters, is a compelling objective now receiving worldwide attention. Scientists and engineers now believe that, the knowledge and technology base potentially applicable to the mitigation of hazards, has grown so dramatically in recent years that, it would be possible, through a concerted co-operative international effort, to save many lives and reduce human suffering, dislocation and economic losses. Communications are central to this effort for public education, early warning, evacuation, and post-disaster relief.

The media acts as the link between the common man and technical information about the risk and the hazards. They absorb and transform technical information provided by either experts or mediators and relay the information to the public in a simple manner.

The strengths of the mass media lie partly in their independence from governments or other agencies, and partly in their ability to attract large audiences who regard them as reasonably credible information sources.

The capabilities of communications, data-gathering, and data-management technology have leaped forward with our increasing knowledge about the origins and behaviour of disasters, and the mitigation of their effects. Indeed, advances in telecommunications and computer sciences are among the major contributors to the recognition that technology can do much to blunt the effects of hazards.

Mass communication is inextricably entwined with disasters and hazard mitigation. The electronic and print media, reflecting great public interest and concern, provide extensive coverage of disasters, particularly those with strong visual impact. And increasingly-as forecasters have gained the ability to predict, the media have covered the near-term prediction and relief planning phases of the event. The media have significantly improved the level and sophistication of their pre and post-disaster coverage in recent years by using new technology and consulting technical experts better able to describe the causes and mitigation of disaster.

The print media, too, have benefited from advanced technology. Facsimile transmission and closer linkages between reporters and specialists in government and academia have deepened understanding of the causes and impacts of these disastrous events, and, no doubt, have had some effect in reducing long-term exposure and risk.

Clearly, mass communications technology already has had a significant impact on how the public learns of and perceives the impact of disasters. And as the costs are further reduced and the capabilities of these technologies improve, the level and sophistication of information presented to the public will also be enhanced.

In addition to the vastly improved opportunities that telecommunications technologies have provided, to report on prospective, ongoing and recent disasters and relief efforts, their capabilities have slowly shifted our thoughts from post-disaster relief to more effective means of coping with sudden disasters.

Better linkages between the public media and the community of disaster mitigation researchers and practitioners, whether scientific, technological, or service-oriented can make disaster management efforts more effective and more important, can accelerate the shift in both the public's and the administrations' thoughts towards effective pre-disaster initiatives.

To this end, the electronic and print media could embark on a two-step process to enhance the quality of its hazard-related services.

## NGOs

NGOs are loosely termed as various organisation from other than the government sector. There are many more NGOs working with deep commitment, dedication and transparency by involving the people and people's resources but they should be well directed. The NGOs are in a position where they can play a very important role not only in identifying and prioritising challenges of the local areas but could also examine and disseminate effectively lessons for action. NGOs working in the following areas can be involved disaster management activities.

- i) Economic and semi-economic development
- ii) Health and mass media
- iii) Educational development
- iv) Training research
- v) Rural/block development
- vi) Entrepreneurial-women empowerment

NGOs, due to their proximity to the people, society, environment etc. are in a better position to take effective steps for proper monitoring of various parameters of success. Voluntary agencies are essentially non-profit and non-partisan organization. The criteria for identifying voluntary agencies for enlisting help in relation to the disaster management programme should be as follows:

- i) The organization should be a legal entity
- ii) It should be based in a rural area or area of intervention and be working there for a minimum of 3 years.
- iii) It should have broad-based objectives serving the social and economic needs of the community as a whole and mainly the weaker sections. It must not work for profit but on 'no profit and no loss basis.
- iv) Its activities should be open to all citizens of India irrespective of religion, caste, creed, sex or race.
- v) It should have the necessary flexibility, professional competence and organizational skills to implement programmes.
- vi) Its office-bearers should not be elected members of any political party.
- vii) It declares that it will adopt constitutional and non-violent means for development purposes.
- viii) It is committed to secular and democratic concepts and methods of functioning.



## 5.9 Peoples participation & Protection of the weaker section, women & children

The old, the children, the infirm, the physically handicapped & the person suffering from diseases should be included in the weaker section in the society. The following action should be taken to ensure more active & meaningful people's participation & for the protection of the weaker section of the society.

A. In natural disaster situation adequate preparedness & relief is not possible only with the help of govt. servants. All the natural calamities specially the earthquake which is catastrophic & destructive requiring rescue of trapped people in debris of the damaged & collapsed houses, removal of dead bodies & injured from the collapsed & damaged houses, providing first aid to injured,, disposing dead bodies "through funeral/burial, providing food, safe drinking water & shelter to the victims etc. are such huge tasks which cannot be handled properly only by govt. machinery & proper rescue, evacuation & relief work will need more meaningful & active participation of the local community as well as NGOs & Panchayat Raj Institutions. The list of selfless workers and NGOs who have already worked in the calamity situation & earned appreciation must be prepared and they should be assigned major role in public awareness, education, relief distribution & even in long term rehabilitation. A definite, & précised order be issued by Revenue & Relief Deptt., Govt. of U.P. after careful consideration. The community members, NGOs & Panchayati Raj Institutions shall also be invited for sharing their views & experiences through media such as TV, Radio & also in seminar & workshop etc.

B. Village will be the focal point of the whole disaster management activities for ensuring continuous awareness & attention towards the need of better management of the catastrophic disaster & for continuous flow of information.

C. The public awareness programme shall also include cultural programmes & Cultural Affair Deptt., Govt. of U.P. shall formulate some structured programmes regarding preparedness for disaster reduction.

D. The inclusion of natural calamities & disaster in school & collage curriculum / textbooks is necessary but only this will not achieve the purpose. Hence on the lines of NSS training camps one-week camp should be organized to give practical exposure to the students as well as community members. The concerned deptts. of the Govt. will immediately take action for the implementation.

E. Adult education is a very affective measure to create awareness among the rural masses & the Adult Education deptt. should immediately include the important points of earthquake disaster preparedness & community participation in disaster management.

- F. Yuwak Mangal Dal, Mahila Mangal Dal & Anganbaris shall share their responsibility towards the awareness programme & in a disaster situation they shall be actively involved in rescue work. The Youth Deptt. & Women Welfare deptt. will evolve a suitable mechanism and implement it as early as possible.
- G. The govt. officials visiting & touring villages regarding their departmental task must arrange people contact programmes & disseminate information concerning natural calamities & disaster & must pursue the awareness programmes along with their departmental programmes. The officials of Revenue, Rural Development, Health Irrigation, Social Welfare, Police, Agriculture, Civil Supply, Animal Husbandry, Electricity, Jal Nigam, Jal Sansthan, Nagar Vikas will be very helpful in spreading the message. All the deptts. will issue G.Os & instructions in this regard.

## Chapter VI Response

### 6.1 Institutional Arrangements

This multi-disaster action plan proposes that all the agencies and departments with their disaster specific functions come under a single umbrella of control and direction, to attend to all kinds of disasters.

#### 6.1.1 Institutional Arrangements at State Level

##### 6.1.1.1 State Disaster Management Authority (SDMA)

State Disaster Management Authority (SDMA) is headed by the Chief Minister of the state and consisting of such other members to be nominated by the Chief Minister. The SDMA will be responsible for laying down policies and plans for disaster management in the state and will approve the state plans prepared in accordance with the guidelines laid down by the National disaster Management authority (NDMA). The SDMA will also approve the disaster management plans prepared by the state government departments and facilitate implementation by recommending provision of necessary funds.

##### 6.1.1.2 State Crisis Management Group (SCMG)

State Crisis Management Group (SCMG) is headed by the Chief Secretary the state and consisting of concerned secretaries to the state government. The SCMG of will assist the State Disaster Management Authority (SDMA) in implementing the National Plan and State Plan and act as the coordinating and monitoring body for disaster management in the state.

##### 6.1.1.3 State Emergency Operations Centre

The State Emergency Operations Centre (EOC) is proposed as the hub of activity during a disaster. The structure of the EOC can expand or contract depending on the situation. The existing arrangements, therefore, will be strengthened by this administrative arrangement at the time of emergency or disaster, which proposes to have the Chief Secretary as the team leader supported by the Relief Commissioner with branch arrangements at the Emergency Operations Centre (EOC). The objective is to have a simplified system of disaster response.

<b>Institutional Arrangements</b>		
Disaster Management System of Uttar Pradesh involves three focal layers of participating organisations		
<b>Agency</b>	<b>Institution</b>	<b>Instrument</b>
Govt. of Uttar Pradesh	State Crisis Management Group (SCMG)	State Disaster Management Action Plan (SDMAP)
District Administration	District Crisis Management Group (DCMG)	District Disaster Management Action Plan (DDMAP)
Tehsil Administration	Tehsil Crisis Management Group (TCMG)	Tehsil Disaster Management Action Plan (TDMAP)
Village Panchayat	Village Disaster Management Committee (VDMC)	Village Disaster Management Action Plan (VDMAP)
Disaster Site	Site Operations Centre comprising Relief Camp, Transit Camp, Cattle Camp, Food Camp	Standard Operation Procedures (SOPs)
There are other players also like CBOs, NGOs, Research Institutions, Experts and above all the Community.		

The primary function of an EOC is to implement the SDMAP which includes coordination, policy-making operation management, data collection, record keeping, public information and resource management.

The State Emergency Operations Centre, its system and procedures are designed in such a way that information can be assessed and relayed to concerned parties. Rapid dissemination contributes to quick response and effective decision-making during an emergency. As the master coordination and control point for all counter- disaster efforts, the State Emergency Operations Centre is the centre for decision- making under a unified command.

In a disaster situation, the State Emergency Operations Centre will come under the direct control of the Chief Secretary or any other person designated by him as the Chief of Operations.

The State Emergency Operations Centre, under normal circumstances, will work under the supervision of the Relief Commissioner. EOC is the nerve centre to support, co-ordinate and monitor disaster management activities at the district level.

Under normal circumstances, the activities of State Emergency Operations Centre are primarily the responsibility of Relief Commissioner's office, along with training and research.

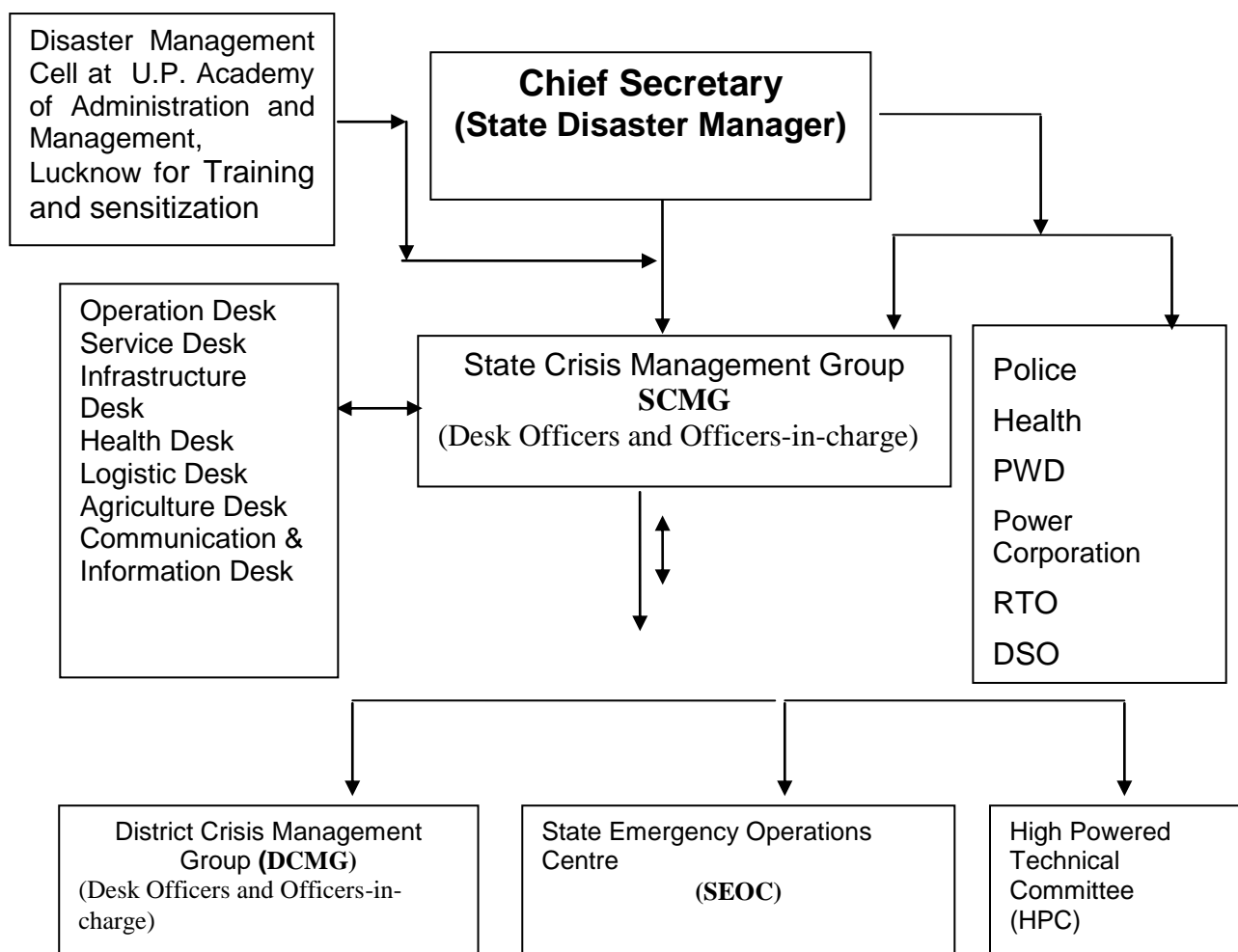
The usual activities of the State Emergency Operations Centre will be to

- (i) Ensure that all the District Crisis Management Groups continue to regularly update the District Disaster Management Action Plan and encourage districts to prepare area-specific plans for areas prone to specific disaster.
- (ii) Identify and interact with central laboratories, research institutions and NGOs to evolve mitigation strategies and setup study groups and task forces for specific vulnerability studies.
- (iii) Serve as a data bank and ensure that due consideration is given to mitigation strategies in the planning process; identify agencies and institutions for locating inventory items.
- (iv) Upgrade and update the State Disaster Management Action Plan according to changing situations in the state.
- (v) Disseminate information about the State Disaster Management Plan (SDMP) to other departments of the Government of Uttar Pradesh and state level agencies.
- (vi) Monitor the training imparted to state level officials, private sector NGOs, CBOs & PRIs.
- (vii) Organise post disaster evaluation and update the State Disaster Management Plan (SDMP) accordingly.
- (viii) Ensure that the warning and communication systems and instruments in the EOC are in working condition.
- (ix) On the receipt of warning or alert from IMD (in case of thunderstorm or squall) or on the basis of reports from Divisional Commissioner/District Collector of the occurrence of a disaster, all community preparedness measures including counter-disaster measures will be put into operation.

The occurrence of disaster would essentially bring into force the following:

- (x) The State Emergency Operations Centre will be on full alert and can be expanded to include branches with responsibilities for specific tasks.
- (xi) An on- going VSAT, wireless communication and hotline contact with the Divisional Commissioner, Collectors and SSPs of the affected districts.

**Diagrammatic Representation of Institutional Arrangements at State Level**



**Response Structure at State Level on occurrence of disaster**

The Chief of Operation (Chief Secretary) will spell out the priorities and policy guidelines and Relief Commissioner will coordinate services of various departments and agencies including national and international aid agencies, and central government agencies. The State Emergency Operations Centre in its expanded form will continue to operate as long as the need for emergency relief operations continue till the long- term plans for rehabilitation are finalised.

For managing long-term rehabilitation programmes, the responsibilities will be that of the respective line departments. This will enable the EOC to attend to other disaster situations, if need be.

The main branches in the State Emergency Operations Centre during a disaster situation will be operation services, resources, infrastructure, health, logistics, and communication and information management. Each branch will have specific tasks to perform with Nodal Officer nominated by the concerned line department. The capacity of the various branches to coordinate amongst themselves and with the field units will ultimately decide the quality of response.

The facilities and amenities to be provided in the State Emergency Operations Centre shall include well designed control room and workstations for the branch and nodal officers equipped with VAST, wireless communication, hotlines, and intercoms. The State Emergency Operations Centre as a databank will keep all district and state level action plans and maps. Provision of a car with wireless communication will be made for the State Emergency Operations Centre during normal times.

Three categories of staff are being suggested for the control room; regular, staff on-call and staff on disaster duty. Regular staff will consist of an officer of the rank of Joint Secretary as the branch officer- in control room. The manager will be a technical person thoroughly conversant with computer technology. Two deputy secretaries will make up the staff-on-call. Staff on disaster duty will be the additional staff who will shoulder additional responsibility in case of a disaster. They will be in the nature of a reserve and may be drawn from the various departments experienced in control room and State EOC operations.

In disaster management, there is a need for coordination between different levels of the government to have a unified command system for coordinated action by all the agencies.

The objective is to ensure that the state action is organized in a disaster situation in a way to-

- Effectively and efficiently meet needs.
- Avoid waste and-duplication of effort.
- Ensure that resources are distributed equitably and to areas of greatest need.

### **List of Departments to be consulted**

Given below is the list of State and Central Government Departments and other autonomous organizations to be consulted with regards to the Thunderstorm and Squall Disaster Management.

## Central Government Departments

- IMD
- Agriculture
- Health & Family Welfare
- Home Affairs - NDM Division
- Surface Transport
- Defense
- Power
- Communication
- Water Resources
- Urban Development
- Railways
- Civil Aviation
- CWC
- BMTPC

## State Government Departments

- Home Department
- Agriculture Department.
- Revenue Department.
- Rural Development Department.
- Medical & Health Department.
- Food & Civil Supplies Department.
- Animal Husbandry Department.
- Energy Department.
- Irrigation Department.
- Public Works Department.
- Education Department.
- Forest Department.
- Urban Development.
- Cooperative Department.
- Environment Department.
- Horticulture Department.
- Industries Department.
- Local urban bodies, Nagar Nigam/Nagar Panchayat

### 6.1.2 Institutional Arrangements at District Level

#### 6.1.2.1 District Disaster Management Authority (DDMA)

District Disaster Management Authority (DDMA) should be constituted for every district in the state under the co-chairmanship of the District Collectors and Chairperson of the Zilla Parishads. The DDMA will act as the district



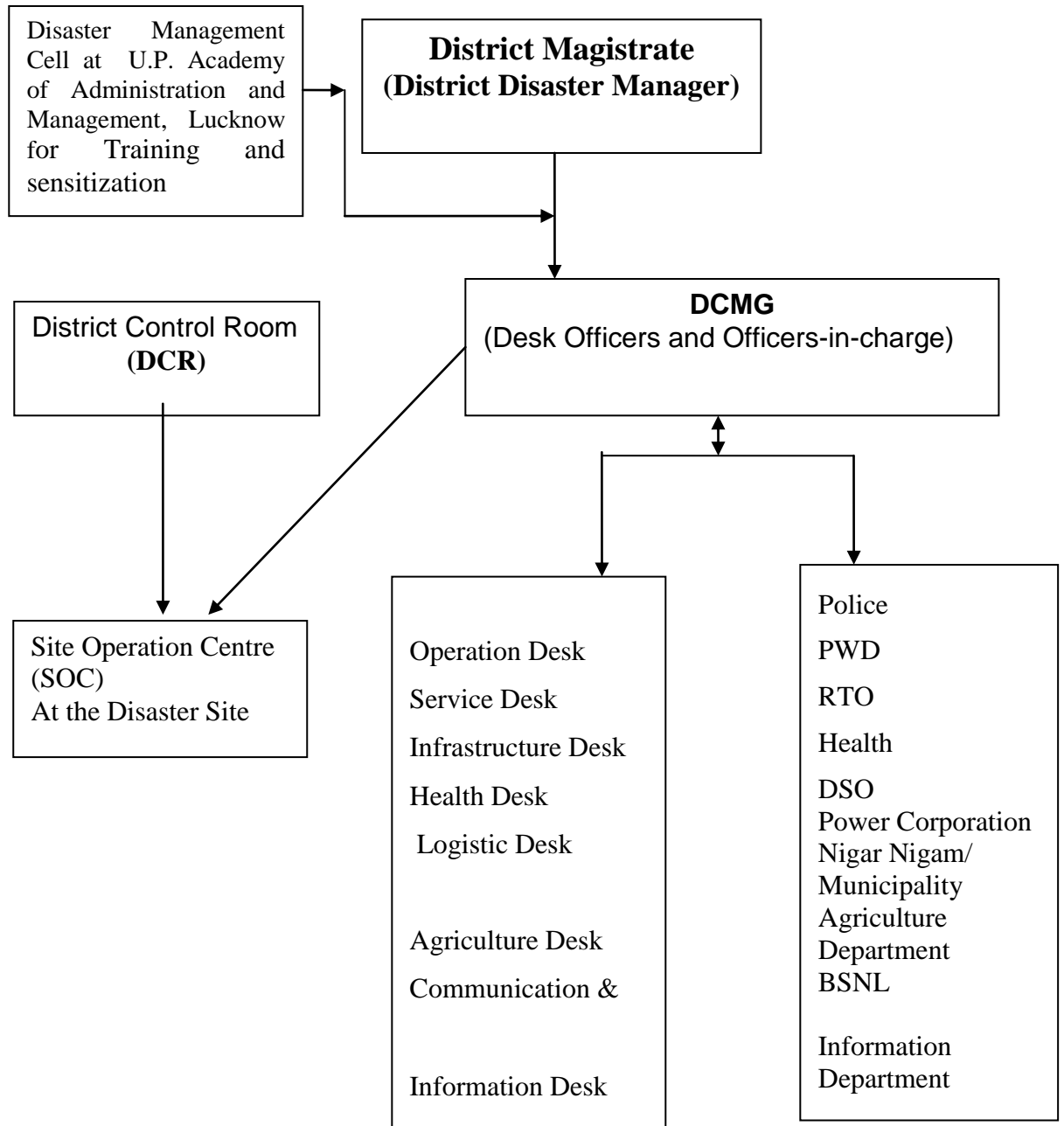
planning, coordinating and implementing body for disaster management at the district level in accordance with the guidelines laid down by the NDMA and the SDMA. The DDMA will identify the areas vulnerable to various disasters, prepare the District Disaster Management Plan and initiate measures for the mitigation of the effects of various natural and man made disasters through coordinated efforts of state government departments, GOS, CBOS and the community at the district, tehsil and village level. The DDMA will further give directions to different authorities at district level, tehsil level and the local bodies to take such other measures for the prevention and mitigation of disasters as may be necessary.

The local authorities such as the Panchayati Raj institutions, municipalities, district board, cantonment board, town planning authority etc will be actively associated with disaster management closely working with the vulnerable communities. All construction projects undertaken by the local authorities will be conforming to the standards and specification laid down for disaster prevention and mitigation, The local authorities will be responsible to carry out relief, rehabilitation and reconstruction activities in the affected areas in accordance with the state plan and district plan.

The Disaster Management Act has constituted two separate funds National Disaster Response fund and National Disaster Mitigation fund at the national state and district levels for comprehensively dealing with disaster at all its cycles. The manner and method of constitution of the funds and the relationship of these two funds with the already existing National Calamity Relief fund and National Calamity Contingency fund and the linkage with various mitigation schemes and programmes under the annual and five year plans are the important issues.

It is expected that all these initiatives in the emerging disaster management framework of the country would have a salutary effect in reducing the risks of disasters in the country in the short and long run.

**Diagrammatic Representation of Institutional Arrangements at District Level**



### **6.1.2.2 District Crisis Management Group (DCMG)**

#### **Operations Desk**

- Search and rescue operations for the victims stranded under the fallen walls, hoardings and trees etc.
- Transportation of injured to the nearest medical facility
- Establishment of Site Operations Centre in the vicinity of disaster site, if required.

#### **Service Desk**

- Search and Rescue requirements as per information.
- Relief requirements.
- Cash Compensation requirements as per information available.

To organize and Coordinate:

- Relief Camps { At State Level}
- Cattle Camps. { At State Level}
- Relief Supplies to Site Operations Centre (SOC).
- Supply of seeds, agricultural inputs & services as per requisition from districts.
- Law & Order.
- Welfare Services.

#### **Coordinate NGO Activities**

- Establish coordination at inter district levels with NGO, CBOs & other state societies which will help State/ District agencies in a disaster.
- Identification & mobilizing of State NGO's as per priority of situation.
- Assign well-defined area of operations & report to State EOC
- Reporting & documentation on procurement & disbursement of relief materials received through governmental & non- governmental channels.

#### **Infrastructure Desk**

- Ensure organization & clearance of debris on major routes and connecting routes in and around disaster site.
- Temporary repairs to damaged infrastructure.
- To bring back power stations / water/ transport/ telecommunication roads/ canals/ bridges to working condition as a part of post disaster recovery.
- Construction of facilities

- Shelters/ Storage/ Educational/ Medical/ Helipads.

### **Agriculture Desk**

- Rehabilitation of agricultural production.
- Ensuring interim crop production through supply of seeds & other essentials.
- Providing services of technically qualified staff.

### **Logistics Desk**

- Assessment of reinforcement needs including manpower & deployment of resources.
- Requirement & availability of depots, transportation of wood for mass cremation and identification of location, manpower & transport for this purpose.
- Request for additional resources from other states.
- Request for additional resources from center such as military or Para military forces.
- Carcasses disposal- location, manpower, transport.
- Ensuring continuous POL supplies for vehicles.
- Storage & safety of Relief Supplies.
- Maintenance of vehicles & equipment.
- Coordination for proper usage & maximum utilization of relief supplies from various NGO's/ Central & International Voluntary agencies

### **Health Desk**

Organize & Maintain records on:

- Disposal of dead bodies.
- Disposal of carcasses.
- Treatment of injured & sick.
- Preventive medicine & anti-epidemic actions.
- Report on food, water supplies, sanitation & disposal of waste

### **Assessment, Supply and Supervision**

- Number of ambulances required
- Medical equipment & medicines required, stocking of medicines etc.
- Any other information. If chances of epidemic spread are there.

- Medical relief for the injured.
- Identification of government and private Trauma Centers or Psychological counseling.

### **Resource Desk**

- Books of accounts- Cash Receipt.
- Books of accounts- Cash disbursement.
- Stock register-relief materials.
- Issue register- relief materials.
- Dead Stock registers for non-consumables.
- Record of personnel TA/DA daily wages etc.
- Record of expenses on Disaster Management, Administration.
- Record of transfer of funds ( as advances) to other govt. departments (suspense a/c)
- Record –cash Voucher & credit voucher
- Record of all gratuitous relief.
- Record of all compensation paid.
- Preparation of records for F& A.

### **Communication and Management Desk**

(Essentially away from State Emergency Operations Centre for security of information & prevention of rumors).

- Setting up Information Center to organize sharing of information with mass media and community.
- Monitor disaster warnings & weather conditions with & on advise of IMD  
(Being done under normal circumstances as well 24x7).

#### **6.1.2.3 District Control Room (DCR)**

The District Control Room has been organized in a similar fashion to the State Emergency Operations Centre.

The flow of information between the EOC and the DCR has been described under normal conditions and disaster situation. Effort is made to evolve a system by which the DCR can set-up site operations centres. The DCR will report all the field activities to the EOC.

In case of disasters which have an impact on more than one district in a division, the role of the Divisional Commissioner comes into prominence. The Commissioner can supervise the contingency plan and work undertaken by the District Magistrate in his division as also on the relief and rehabilitation operations in those districts.

**Emergency Telephone & Address Directory**  
(to be prepared and updated by functionaries of State Emergency Operations Centre at the state level and District Control Room at the district level)

S.No.	Name of key functionaries	Office Address	Residential Address	Mobile No.	Office Phone No.	Residential Phone No.

**6.1.3 Institutional Arrangement at Tehsil Level**

Tehsil Crisis Management Group (TCMG) shall be constituted at the Tehsil level to be headed by the SDM or Tehsildar (in those tehsils where SDM is not there) with officers from all the line departments as members which include Dy.SP/CO, Fire station Officer, In charge of Community Health Centre/PHC, Asstt. Engineer PWD, Asstt. Engineer Irrigation, BDOs & Incharge Krishi Vigyan Kendra etc.

**6.2 Identifying Response Level**

**6.2.1. Alerts**

Early Warning System for different disasters should be in a place so that concerned administrative machinery and communities can initiate action to minimize the loss of property and life.

It is not possible to completely do away with the devastation of natural hazards like thunderstorm or squall. However, experience has shown that destruction from natural hazards can be minimized by the presence of a well – functioning warning system, combined with preparedness on the part of the vulnerable community/society. Warning systems and preparedness measures reduce and modify the scale of disasters.

**IMD should be indentified the Nodal agency to sound Alerts in case of thunderstorm and squall.**

A community that is prepared to face disasters and timely receives and understands warnings of impending hazards and has taken precautionary and mitigation measures will be able to cope up at an early and effectively and can sooner resume the normal life.

In order to ensure that prediction has a meaning to save lives, we should be able to say When, Where and What Size would the storm be? This is not possible, very precisely particularly regarding when.

### **6.2.2 First Information Reports**

First Information Reports need to be the trigger point for those disasters for which forecasting is not feasible, or where the time window between warning and occurrence of disaster is very narrow. This applies to thunderstorm and squall as well.

A copy of the reporting format is appended in the next page:

## REPORTING FORMATS

<b>District</b>	:
<b>Date of Report</b>	:
<b>Nature of Calamity</b>	:
<b>Date and Time of Occurrence</b>	:
<b>Duration of Occurrence</b>	:
<b>Number and Names of the Tehsils Affected</b>	:
<b>Number of villages Affected</b>	:
<b>Number of Ward affected (in Town area)</b>	:
<b>Number of Persons</b>	:
<b>Died</b>	:
<b>Missing</b>	:
<b>Injured (Incapacitated)</b>	:
<b>Animals Affected</b>	:
<b>Lost</b>	:
<b>Crops Affected</b>	:
<b>Number of houses damaged</b>	:
<b>Damage to Public Properties</b>	:
<b>Electricity Poles</b>	:
<b>Telephone Poles</b>	:
<b>Roads</b>	:
<b>Buildings</b>	:
<b>Schools</b>	:
<b>Panchayat Ghars</b>	:
<b>Community Halls</b>	:
<b>Bridges</b>	:



### 6.2.3 Criteria for Level Definitions

Severity of Damage / Expected Damage

Damage reports and/or damage simulations may be used

Extent of Damage

Geographical and functional spread of damage

Need for Direct Involvement of Central Government Departments

Thresholds beyond which involvement of Central Government is automatically warranted.

The above criteria is applicable solely on the findings and recommendations on the basis the factual position by the District Magistrate / local district administration.

Indian meteorological Department is the lead agency for monitoring storms. It is the responsibility of IMD to provide information about the magnitude of the storms.

Keeping in view the present infrastructure of India Meteorological Department it is very difficult to predict the precise time and place of occurrence of squall or thunderstorm in Uttar Pradesh.

Thunderstorm or squall can be managed at the district or state level. Since Uttar Pradesh is not a coastal state and possibility of severe cyclonic storm is not there. In view of this there is a rare possibility of storm getting a large dimension affecting a very large region of the state which calls for a National Level disaster, requiring direct intervention of the Central Government (L3).

**L1: A District Level disaster, within the capabilities of the District Administration to deal with.**

**L2: A State Level disaster, within the capabilities of the State Government to deal with.**

**L3: A National Level disaster, requiring direct intervention of the Central Government.**

In addition to the disaster situations, the following 'peace-time' situation has also been identified:

L0: A 'no-disaster' situation. This is the level at which surveillance; preparedness and mitigation activities must be focused on.

### 6.3 Emergency Response : First 24 Hours

State Relief Commissioner is the competent authority to press the trigger.

Conditions under which trigger may be pressed are specified such as a request from District Magistrate to upscale L1 Similarly declaration of L1 in number of districts, occurrences requiring direct intervention are declared by the State Relief Commissioner.

State Emergency Operations Centre, located at the 6th Floor, Bapu Bhawan, Secretariat, Lucknow is the focal point for all the activities pertaining the disaster response and recovery.

Location, layout, strength, person in charge, infrastructure specifications for setting up of control room is intimated by the state government to all concerned.

Control Rooms at district level are simultaneously set up and time, location, strength, person in charge, infrastructure specifications for its setting up is intimated by the state government to all concerned.

Quick Response Teams to be dispatched to affected area. Time, strength, list of members, person in charge, infrastructure specifications for teams etc. is communicated to all concerned.

Quick Response Teams to comprise two sets of officials:

- Line Officers Team, and
- Area Officers` Pool.

An appropriate organizational set up at the State level to cope with the incoming relief and rescue measures is an urgent necessity, so that in disaster situations of colossal magnitudes, no time is lost in directing the incoming relief and rescue measures to the exact locations where they are required.

Some of the relevant issues are :

- a. The qualitative requirement for the assessment teams and assistance teams to be defined clearly.
- b. There should be collaboration among the neighboring states with respect to thunderstorm/ squall management.
- c. Response requirement may be extensive.
- d. Revision of existing system of response mechanism in the work of natural and man made disasters.
- e. The concept of trigger mechanism has been incorporated as an enough quick response mechanism, which would spontaneously

set the vehicle of management in to motion. The trigger mechanism has been envisaged as preparedness plan where by the receipt of an signal of impending disaster would simultaneously energize and activate the mechanism for response and mitigation without loss of time and issuing orders. This attains greater significance in the context of thunderstorm/ squall as the duration of this hazarding is not a long one but the impact is damaging. Timely alerts and warnings can save many precious lives.

### **Thunderstorm/ squall Information\_:**

IMD should immediately inform State Emergency Operations Centre as well as District Control Room about the incoming of thunderstorm/ squall. So that warning can be issued by District Administration through public address system (loudspeakers). Timely information in this regards from help minimizing the impact of thunderstorm/ squall on the highly vulnerable group of the society i.e. school children.

### **Immediate Requirements :**

Damage is caused due to toppling or falling of existing structures, resultant fire, destruction of bridges, snapping of telephone and electric lines in the event of onslaught of the thunderstorm/ squall in a particular area. All this causes great loss of life and property and a general chaos prevails in the area. Immediate measures which are required to mitigate the sufferings are given below:

### **Communication :**

There will be a need, to restore both road and telecommunication at an earliest possible. District/ Tehsil / City Disaster management teams should be equipped with alternate means of communication such as HAM radios. This team should also be tasked to mobilize the locals in providing immediate rescue, first aid and evacuation of wounded personnel to hospitals.

### **Medical aid :**

A proper plan for medical assistance should be worked out and prepared by Medical Department at the state and district level. Mobile vans should be deployed at the vulnerable areas immediately after the alerts are issued by IMD and primary treatment areas and hospitals should be kept ready.

### **Organisation of Relief Centres**

Unlike other natural calamities the tents should not be used for storm victims, since the repeated thunderstorm/ squall may blow up tents or tin sheds. Community centres or school building in natural disaster (thunderstorm/

squall) prone areas should be identified as shelter houses for the disaster victim.

### **Water Management**

Water sources are likely to be polluted or covered with dust and therefore arrangement should be made to bring water from safe sources. Here again the purification of water should be attended to avoid spread of any epidemic. Repairing of broken pipelines should be immediate priority.

### **Food**

The storm affected population particularly the slum dwellers initially need an arrangement for cooked food for which plans should be made for movement of food-grains, utensils, volunteers for cooking food and its supply to the victims. Subsequently efforts should be made to make the individual and families cook their own food within a period of one week. For this necessary utensil, rations and fuel will have to be provided.

### **Communications**

Restoration for communication at the fastest pace is essential, both from the point of view of reaching the victims, assessing damage as also to render necessary assistance. Plan should include the following:

- a) Restoration of telecommunication and deployment of mobile radio detachments till normal communication systems are restored.
- b) Reconstruction of damaged bridges, clearance of roads and paths inside the villages/ towns for speedy movement of men and material for rescue and relief work.

### **Line Officers' Team**

Officials from line departments, led by nodal control officer. Give feedback to district and state control room.

Rush immediately for quick assessment and quick response.

Their roles and framework are specified in advance with self contained operational framework, protocol briefs and instructions.

### **Area Officers' Pool**

Officers belonging to the affected area, those officers who have served in affected districts as DMs or SPs, if needed should be sent to the affected area and stay there till the local administration stabilizes.

Their roles and framework are specified in advance with self contained operational framework, protocol briefs and instructions.

## Assistance Teams

Communications, Medical, Power, Armed Forces. These are to be activated depending on the feedback of the concerned person in the QRT.

## Search, Rescue, Evacuation, Relief Operations

Mobilization procedure of SAR teams. The details of the SAR teams both at the State and District level are as under :

Setting of Search and Rescue Team for immediate response during Disaster under Additional Commissioner Search and Rescue. At State level the proposed team and Infrastructure are as under :

### Team

a. Team Commander	1
b. Deputy team Commander	1
c. Operations group 3 each comprising of 8 fire personnel	24
d. Technical support comprising of technical people drawn from IT communication and Engineering.	4
e. Medical support comprising of 1 doctor also expert in trauma and 1 male plus 1 female multi- purpose Para medical staff.	3
f. Administrative support I Admin. Officer with 2 support staff. Rest volunteer	3
<b>Rest volunteers</b>	

**Total = Approximately 200**

Evacuation plans with maps and list of available and accessible infrastructure. Relief distribution plans with list, types, quantities, and locations, and movement and distribution details of pre-stocked relief material.

## Role of State Crisis Management Committee (SCMG)

If approached by the district administration for help the State Crisis Management Committee can meet.

### Role of State Technical Committee

This committee is mainly for planning during L0 phase, but needed here as standby for clarifications and contingencies.

### Teams

- (i) Every state should develop a disciplinary cadre under the Relief Commissioner comprising of 200 to 300 persons who could be deployed for relief works.
- (ii) Search and rescue teams, Disaster medical assistance teams, specialized emergency operation teams are to be instituted at the State and District level.
- (iii) The Police authorities shall arrange for medical examination and post-mortem teams.

### e. First 48 Hours : State Control Room

Information, Planning & Reporting  
Instruments, Performs, Contacts etc. provided.

Relief Coordination  
Local for district and Panchayati levels.  
From Outside the State

Impact Assessment  
External/Military Support

**If damage due to thunderstorm and or squall is severe and it calls for L2 level response i.e. State Level Invention is required on the request of district administration. In this case State Crisis Management Committee and State Technical Committee can meet to work out the relief and recovery strategy.**

### Emergency Support Function and Agency Responsible for Infrastructure restoration

Preparedness	Responsibility
Formation of task force with specific equipments	Relief Commissioner
Assigning responsibilities for specific areas.	PWD, National Highway authorities
Road clearing (removal of trees and poles) activities to assist local relief work	PWD & NH authorities
Towing vehicles, Earth moving equipments,	

cranes, construct temporary roads  Damage assessment Monitoring	PWD, Irrigation and NH authorities   All Tahasildars & BDOs
--	--

### Emergency Support Function (ESFs)

The ESFs, comprising various coordinating agencies, will be manage and coordinate specific kinds of assistance, which are common to all types of disasters. For each ESF there will be a lead department or agency responsible for the delivery of goods and services to the disaster area. These lead agencies will be supported by a number of other department/agencies. The ESFs forms an integral part of EOC.

In the State response plan, the proposed ESFs will identify requirements, mobilize and deploy resources to the affected areas and assist the districts in their response action under thirteen ESFs. The ESFs will come into operation only on either receipt of warning of an expected calamity or in the event of a sudden emergency.

The ESF will coordinate directly with their functional counterparts at the district level (L2) and also with central government agencies or ministries (L2 & L3). The only situation where the State government will contact the central government for L2 level emergencies will be for situations/ emergencies for which there is either no past experience (e.g. earthquake) or in situations where the experience and expertise available is inadequate (for example, a terrorist attack using weapons of mass destruction).

The details of the primary and secondary agencies for each type of ESF are given below in Table-A. The responsibilities, initial activities on receipt of warning and minimum standards for each ESFs are given in Table-B. Checklists of ESF requirements are given in Table-C.

**Table-A**

<b>ESF No.</b>	<b>Service Function</b>	<b>Primary Agency</b>	<b>Support Agencies</b>
1	Communication	Relief Commissioner	<ul style="list-style-type: none"> <li>• IMD</li> <li>• Doordarshan</li> <li>• All India Radio</li> <li>• Department of Telecommunication</li> <li>• S.P. Signals</li> <li>• Agriculture Department</li> <li>• Department of Fisheries &amp; Animal Husbandry</li> <li>• Department of Energy</li> <li>• Department of Agriculture</li> <li>• Ministry of Civil Aviation</li> </ul>
2	Public Health and Sanitation	Departments of Health and Family Welfare	<ul style="list-style-type: none"> <li>• Home Department</li> <li>• Department of Energy</li> <li>• Health NGOs</li> <li>• Transport Department</li> </ul>
3	Transport	Transport Department	<ul style="list-style-type: none"> <li>• Home Department</li> <li>• Works Department</li> <li>• Revenue Department</li> <li>• Ministry of Civil Aviation</li> <li>• Railways</li> <li>• Army</li> </ul>
4	Power	Department of Energy	<ul style="list-style-type: none"> <li>• Subsidiary Companies</li> <li>• Army</li> <li>• Transport Department</li> </ul>
5	Search and Rescue	Home Department	<ul style="list-style-type: none"> <li>• Fire brigade, Police</li> <li>• Civil Defence</li> <li>• Army</li> <li>• Department of Transport</li> <li>• Department of Health and Family welfare</li> <li>• NGOs</li> </ul>
6	Public Works and Engineering	Rural Development/ Works Dept.	<ul style="list-style-type: none"> <li>• Water Resource</li> <li>• Panchayati Raj Department</li> </ul>
7	Relief Supplies	Revenue Department	<ul style="list-style-type: none"> <li>• Relief Commissioner</li> <li>• District Administration</li> <li>• Agriculture Department</li> <li>• Transport Department</li> <li>• Food &amp; Civil Supplies Department</li> <li>• NGOs</li> </ul>
8	Information and Planning	EOC	<ul style="list-style-type: none"> <li>• Information Department</li> </ul>
9	Food	Civil Supply	<ul style="list-style-type: none"> <li>• District Administration</li> <li>• Transport Department</li> </ul>



			<ul style="list-style-type: none"> <li>• Railways</li> </ul>
10	Drinking Water	Nagar Nigam Jal Sansthan/ Municipality /Jal Nigam	<ul style="list-style-type: none"> <li>• Health and Family Welfare Department</li> <li>• NGOs</li> </ul>
11	Shelter	Urban Development, Housing, Awas Vikas Parishad, Rural Development	<ul style="list-style-type: none"> <li>• Revenue Department</li> <li>• Department of energy</li> <li>• NGOs</li> </ul>
12	Media	Dept. of Information and Public Relations	<ul style="list-style-type: none"> <li>• Department of Agriculture</li> <li>• Department of Health and Family Welfare</li> <li>•</li> </ul>
13	Help Line	EOC	<ul style="list-style-type: none"> <li>• Department of Health and Family Welfare</li> <li>• Police</li> </ul>

**Table – B**

ESF No	Service Function	Activities on receipt of warning	Responsibility
1	Communication	<ul style="list-style-type: none"> <li>• Establishment of radio communication with the District, Block and affected areas</li> <li>• Designation of a nodal officer</li> <li>• Review of existing precautionary measure to be taken to protect equipments</li> <li>• Designing an emergency tool kit</li> <li>• Identification of functional telecommunication facilities in the area</li> <li>• Establishment of emergency operation centres at the affected areas</li> <li>• Provision of temporary communication facilities to vital installations</li> <li>• Damage assessment</li> </ul>	<ul style="list-style-type: none"> <li>• Ensuring two way telecommunication link from State to District, blocks, and affected site</li> <li>• Establishment of temporary communication in the affected area</li> </ul>

		<ul style="list-style-type: none"> <li>• Opening of temporary facilities for public use</li> </ul>	
2	Public Health and Sanitation/ Animal Health	<ul style="list-style-type: none"> <li>• Designation of a nodal officer</li> <li>• Assessment of injuries, illnesses, drugs another medical items and medicines</li> <li>• Ensuring supply of essential medicines and medical items</li> <li>• Dissemination of information to all hospitals in the affected area to gear up to the task of receiving large number of patients</li> </ul>	<ul style="list-style-type: none"> <li>• Meet medical and sanitation requirements of affected people</li> <li>• Coordination in evacuation of injured/sick</li> <li>• Coordination of the movement of mobile health teams</li> <li>• Checking of drugs and equipments most needed to tackle emergencies</li> </ul>
3	Transport	<ul style="list-style-type: none"> <li>• Designation of a nodal officer</li> <li>• Arrangement of emergency transport for the affected areas for assisting in evacuation, transportation of injured, provision of emergency relief etc.</li> <li>• Stock piling of adequate fuel for emergency operations</li> </ul>	<ul style="list-style-type: none"> <li>• Provision for transport support to departments/ agencies involved in emergency operation</li> </ul>
4	Power	<ul style="list-style-type: none"> <li>• Designation of a nodal officer</li> <li>• Stock piling of equipments likely to be needed after a disaster</li> <li>• Checking of emergency tool kits</li> <li>• Ensure continuous power supply to vital installation</li> <li>• Advance Deployment of emergency teams in the areas likely to be affected by disaster</li> </ul>	<ul style="list-style-type: none"> <li>• Restoration of power supplies</li> </ul>
5	Search and Rescue	<ul style="list-style-type: none"> <li>• Designation of a Nodal officer</li> <li>• Assessment and arrangement of specialised</li> </ul>	<ul style="list-style-type: none"> <li>• Provision of Search &amp; Rescue assistance including locating, extricating and providing on-site medical treatment</li> </ul>

		<p>equipments and manpower to conduct Search and Rescue Operation in the areas likely to be affected by disaster</p> <ul style="list-style-type: none"> <li>• Carry out search and rescue operations in coordination with local NGOs, trained volunteers, etc.</li> </ul>	to trapped victims
6	Public Works and Engineering	<ul style="list-style-type: none"> <li>• Designation of a nodal officer</li> <li>• Keeping alert all the technical staff</li> <li>• Reviewing and updating of precautionary measures necessary to protect equipments from the impact of impending disasters</li> <li>• Inspection and emergency repair of roads, bridges, building structures of vital installations</li> <li>• Assembling of emergency tool kits</li> </ul>	<ul style="list-style-type: none"> <li>• Provide technical advice and evaluation of roads, bridges and other installations to minimize the damage following disaster</li> </ul>
7	Relief Supplies	<ul style="list-style-type: none"> <li>• Designation of a nodal officer</li> <li>• Documentation of all response activities</li> <li>• Maintaining communication with all the agencies/departments to expedite response activities</li> <li>• Coordinate all planning procedures</li> </ul>	<ul style="list-style-type: none"> <li>• Collection and dissemination of information about potential disasters to facilitate and coordinate activities of various departments/ agencies</li> </ul>
8	Information and Planning	<ul style="list-style-type: none"> <li>• Designation of a nodal office</li> <li>• Advance planning for stockpiling and movement of relief to the area likely to be affected by disaster</li> <li>• Identification of locations for establishing temporary shelters, free kitchens etc.</li> </ul>	<ul style="list-style-type: none"> <li>• Coordination of activities related to temporary shelters and emergent relief distribution</li> </ul>

9	Food	<ul style="list-style-type: none"> <li>• Designation of a nodal officer</li> <li>• Advance assessment of food needs of the area likely to be affected</li> <li>• Resourcing suppliers</li> <li>• Identification of locations for air dropping</li> <li>• Preparation, Stockpiling and ensuring quality control of the food aid</li> </ul>	<ul style="list-style-type: none"> <li>• Identify the needs of food in the areas, obtaining supplies and transportation of food to the areas affected by disaster</li> </ul>
10	Drinking Water	<ul style="list-style-type: none"> <li>• Designation of a nodal officer</li> <li>• Advance setting up of water points in the areas likely to be affected by disaster and advance planning for transportation of water</li> <li>• Stockpiling and movement of water purifiers and other emergency equipments to the area likely to be affected by a disaster</li> </ul>	<ul style="list-style-type: none"> <li>• Provision of safe drinking water and minimising spread epidemics in the area</li> </ul>
11	Shelter	<ul style="list-style-type: none"> <li>• Designation of a nodal officer</li> <li>• Preparation of earmarked shelters to receive evacuees</li> <li>• Movement of temporary shelter materials to the areas likely to be affected by disaster</li> <li>• Identification and preparation of areas to be used for housing evacuees and relief camps</li> </ul>	<ul style="list-style-type: none"> <li>• Meet the shelter needs of the evacuees</li> </ul>
12	Media	<ul style="list-style-type: none"> <li>• Designation of a nodal officer</li> <li>• Immediate dissemination of the impending disaster through appropriate media</li> <li>• Cautioning the population likely to be affected about the do's and don'ts about the impending disaster</li> </ul>	<ul style="list-style-type: none"> <li>• Collection and dissemination of reliable information</li> </ul>

13	Help Line	<ul style="list-style-type: none"> <li>• Designation of a nodal officer</li> <li>• Collection of information from each ESF response activities</li> <li>• Managing public queries</li> </ul>	<ul style="list-style-type: none"> <li>• Management of the flow of information to ensure accuracy as well as easy and appropriate access</li> </ul>
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**Table-C**

<b>Emergency support function</b>		<b>Requirements</b>
1	<p><b>Communication</b></p> <ul style="list-style-type: none"> <li>◆ Assess damage and reinstall facilities</li> <li>◆ Establish two-way communication at the earliest</li> <li>◆ Warn people against areas that are likely to get affected</li> <li>◆ Special care on security matters</li> </ul>	<p>VSATs, battery charged communication equipment, HAM radios, Inventory of mobile communication facilities</p>
2	<p><b>Health and sanitation</b></p> <ul style="list-style-type: none"> <li>◆ Assess extent and type of injuries</li> <li>◆ Special care for epidemic outbreaks</li> <li>◆ Distribute chlorine and halogen tablets and ORS</li> <li>◆ Supply of contamination free drinking water</li> <li>◆ Provide medications for water borne diseases</li> <li>◆ Special care for injured and traumatized people</li> </ul>	<p>Specialised medical team to handle orthopaedic and surgery related injuries including, epidemics, preventive medicine practitioners Mobile Teams/ Units</p>
3	<p><b>Transport</b></p> <ul style="list-style-type: none"> <li>◆ Provision transport for relief supplies</li> <li>◆ Coordinate with other ESF for clearing of roads and other means of transport</li> <li>◆ Provide appropriate transport for easy access</li> </ul>	<p>Inventory of transport / water way facilities in the area</p>
4	<p><b>Power</b></p> <ul style="list-style-type: none"> <li>◆ Assess damage to electric poles and stations etc.</li> <li>◆ Back up power supply</li> <li>◆ Prevent short circuiting and accidents</li> <li>◆ Restore facilities at local and state level</li> <li>◆ Salvaging</li> </ul>	<p>Inventory of power installations of the area, Emergency tool kit, Extra manpower and equipments i.e., Generators etc</p>
5	<p><b>Search and Rescue</b></p> <ul style="list-style-type: none"> <li>◆ <u>Search for victims buried under uprooted trees and fallen electricity,</u></li> </ul>	<p>Equipments cache</p>

	<p><u>telephone poles and hoardings</u></p> <ul style="list-style-type: none"> <li>◆ Specialised sniffer dogs</li> <li>◆ Collapsed structure search and rescue experts</li> </ul>	
6	<p><b>Public Works Department</b></p> <ul style="list-style-type: none"> <li>◆ Clear areas for relief camps</li> <li>◆ Clear roads for easy movement of relief and transport vehicles</li> <li>◆ Seal areas and buildings that are likely to cause further damage</li> <li>◆ Provide temporary bridges and alternate roads</li> </ul>	<p>Specialised equipment for large debris</p> <p>Specialised equipment for bridges and other temporary structures</p> <p>Emergency tool kit</p>
7	<p><b>Information and planning</b></p> <ul style="list-style-type: none"> <li>◆ Release flood related information to all ESF</li> <li>◆ Provide access to resource inventories and document all situation-reports and procedures</li> </ul>	<p>Information networking</p> <p>Inventories</p>
8	<p><b>Relief Supplies</b></p> <ul style="list-style-type: none"> <li>◆ Provide basic logistic materials required for local administration</li> <li>◆ Provide other relief materials such as batteries, flash lights etc., to victims and rescue workers</li> <li>◆ Compile information on the specific needs of the people and relief requirements</li> <li>◆ Distribute relief by means of air dropping and boats to marooned/trapped victims</li> </ul>	<p>Inventory of relief supplies</p> <p>Socio economic needs</p> <p>Culture needs.</p>
9	<p><b>Food</b></p> <ul style="list-style-type: none"> <li>◆ Provide food packs that contain dry and non-perishable food items and packaged water</li> </ul>	<p>Inventory of non-perishable food items and packaged water</p>
10	<p><b>Drinking water</b></p> <ul style="list-style-type: none"> <li>◆ Provide clean drinking water</li> <li>◆ Ration existing water supplies for even distribution</li> <li>◆ Mark and warn people against contamination</li> <li>◆ Isolate contaminated sources of water</li> </ul>	<p>Inventory of water sources of the area</p>
11	<p><b>Shelter</b></p> <ul style="list-style-type: none"> <li>◆ Provide weather resistant shelter</li> <li>◆ Place shelters in a safe area</li> </ul>	<p>Inventory of specific type of shelters for earthquakes/ cyclones and floods</p>
12	<p><b>Media</b></p> <ul style="list-style-type: none"> <li>◆ Information on current status</li> </ul>	
13	<p><b>Help lines</b></p>	

	<ul style="list-style-type: none"><li>◆ Provide information on marooned victims</li><li>◆ Hospitals</li><li>◆ Receive messages of victims and forward them to relatives outside the disaster area</li><li>◆ Provide emergency phone lines</li></ul>	Inventory of emergency phone numbers
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## Chapter-VII

# Partnership with other stakeholders

Effective Disaster Management in Uttar Pradesh can only be achieved through partnership and networking with various organization involved in research and development work on thunderstorm and squall forecasting and development of early warning systems for natural disasters. Partnership with the following stakeholders can certainly enhance the disaster management mechanism in Uttar Pradesh.

1. Academic Institution of Govt. of Uttar Pradesh and Govt. of India
2. Scientific Institutes of Govt. of Uttar Pradesh and Govt. of India

### 7.1 Role and responsibility of Academic Institutions of Govt. of Uttar Pradesh and Govt. of India:

Sl. No.	Name of Academic Institutions	Role and responsibility
1.	I.I.T., Kanpur, GOI, All Engineering Colleges based in U.P.	Research and knowledge networking with other institutions and organizations within and outside the country for precision forecasting of thunderstorm and or squall.
2.	Department of Atmospheric Sciences, University of Allahabad, (Central University)	Knowledge networking with other institutions and organizations within and outside Uttar Pradesh for Precision forecasting of thunderstorm and or squall.
3.	Agriculture Universities located in U.P. and Krishi Vigyan Kendra	Sensitization, awareness of masses for disaster risk mitigations for various disasters

- \* Disaster Management Cell of U.P. Academy of Administration and Management can start some specific skill development process for master trainers nominated by the Departments of Social Work/Sociology, Education & Civil Engineering of all the Universities /Technical Universities established with the territory of Uttar Pradesh, who will in turn impart training for sensitization and awareness among masses at block and village level on various aspects of thunderstorm and squall mitigation.



## 7.2 Role and Responsibility of various Scientific Institutes of Govt. of Uttar Pradesh and Govt. of India

Sl.No.	Name of Scientific Institute /Department	Central Govt./State Govt.	Role and responsibility
1.	IMD, Lucknow/ New Delhi, Gol	Govt. of India	<p><u>Installation of at least 04 lighting arresters and 02 doppler radars to cover the entire Uttar Pradesh as well as surrounding areas for forecasting of thunderstorm and or squall.</u></p> <p><u>Establishment of Observation Recording Stations and their two way connectivity with lighting arrester/Doppler radars for real time recording and with State Emergency Operation Centre, Lucknow for dissemination of near real time warning about squall or thunderstorm.</u></p>
2.	Dept. of Space Gol	Govt. of India	<p><u>Contribution for Installation of lighting arresters and Doppler radars.</u></p> <p>Contribution for Installation of automatic weather monitoring stations and research and development work on new techniques of forecasting the thunderstorm and or squall. Help in near real time dissemination of forecast.</p>
2.	Remote Sensing Applications Centre- Uttar Pradesh, (Department of Science & Technology)	Govt. of U.P.	GIS based database creation for all the major townships and cities of Uttar Pradesh.
3.	Council of Science & Technology, (Department of Science & Technology)	Govt. of U.P.	Sensitization, awareness of masses for disaster risk mitigations for various disasters including thunderstorm and squall mitigation through exhibition, and training sessions at village level and by organizing elocution contest in various schools and colleges.

### **7.3 Need for Constitution of High Powered Technical Committee at the State Level**

A high powered technical committee should be constituted under the Chairmanship of Relief Commissioner for initiating, implementing and monitoring all the activities pertaining to Natural Hazards including designing the broad framework of storage facilities for harvested crops. Nominated Nodal Officers named by various agencies, academic institutions, state and Central Govt. departments should be the members of this committee. **This committee may comprise following members-**

1. Director, IMD, Govt. of India, Lucknow
2. Representative of the Director, IIT, Kanpur,.
3. Head of the Department/Professor from Department of Atmospheric Sciences, University of Allahabad
4. Nodal Officer from Agriculture Department, Govt. of U.P. (Not below the rank of Director)
5. Nodal Officer from Department of Rural Development, Govt. of U.P. (Not below the rank of Additional Commissioner)
6. Nodal Officer from Uttar Pradesh PWD (not below the rank of Chief Engineer), Govt. of U.P.
7. Director, Remote Sensing Applications Centre, U.P., Lucknow

Special invited members of this committee may be from the Institutions or (working in the field of atmospheric sciences) based out side Uttar Pradesh.

1. Center for Atmospheric and Oceanic Sciences, Indian Institute of Science, Bangalore
2. Indian Institute of Tropical Meteorology (IITM), Pune

## Chapter-VIII

# Financial Arrangement

In the event of disaster striking, there are two types of needs of the victims. One is related to the immediate relief and the other is in the form of reconstruction and rehabilitation of the victims. Funding for the immediate relief is short term, while reconstruction and rehabilitation require long term funding. There are sources for both. For example, National Calamity Contingency Fund provides assistance for immediate relief only and Calamity Relief Funds of various states are sources for long term funding. Similarly, voluntary donations are usually short term, while international organisations like UN agencies provide support over a period of time, sometimes extending up to 15 years. Apparently, there are governmental sources as well as non-governmental sources for both types of funding. A brief account of funds available from Central Government sources is given below-

### 8.1 Central Government sources

#### 8.1.1 National Calamity Contingency Fund (NCCF)

Set up on the recommendation of the Eleventh Finance Commission, the manner and extent of assistance required to be provided to the states from NCCF for immediate relief and rehabilitation is decided by a High level Committee constituted by the Ministry of Home Affairs. This Committee is serviced by the Disaster Management Division of the Ministry and consists of Home Minister, Agriculture Minister, Finance Minister and Deputy Chairman, Planning Commission. The procedure is that the states submit the memorandum for central assistance. The committee takes into account the recommendation of the central teams to assess the requirements and thereafter as per the decision, the release of funds to the state governments is made by the Ministry of Finance.

National calamities of cyclone, drought, earthquake, fire, flood and hailstorm, considered to be of severe nature requiring expenditure by the state governments in excess of the balances available in their respective CRFs qualify for relief assistance. The earlier corpus of the Fund was Rs. 500 crore. The assistance is only for immediate relief and rehabilitation. Expenditure on reconstruction of assets or restoration of damage is not covered under the scheme, which is to be financial through reallocation of plan funds. Any assistance provided by the Centre from this Fund is to be accompanied by imposition of the special surcharge so that it is immediately recouped.

At the state level, the committee constituted by the state government to administer the CRF is responsible for incurring the expenditure as decided by

High Level Committee. The responsibility of monitoring the scheme is now vested in the Ministry of Home Affairs, Government of India.

### 8.1.2 Calamity Relief Fund (CRF)

This fund was created as per the recommendation of the Ninth Finance Commission. Constituted by each state, it is to be used for meeting the expenditure for providing immediate relief to the victims of cyclone, drought, earthquake, fire, flood and hailstorm. **Of the total contribution, 75% is contributed by Central Government and the remaining amount comes from state governments' own resources.** This amount is contributed on annual basis. Share of Central Government is in the form of Grants-in-aid and is remitted to state governments in two installments on 1st May and 1st November in each financial year.

There are certain conditions attached for the fund's release-

- i) Fund has been duly constituted by the state government as prescribed and creation is certified by the Accountant General of the State.
- ii) Furnishing certificate to the Ministry of Finance indicating that the amount received earlier has been credited to the fund along with the state's share and a statement giving the up-to-date expenditure.
- iii) Annual Report on Natural Calamities is submitted to the Ministry of Home Affairs, which communicates the same to the Ministry of Finance.
- iv) The release of both the installments is made by the Ministry of Finance subjected to the above mentioned conditions being satisfied unless advised by Ministry of Home Affairs for withholding of release to any state.

## 8.2 State Government Sources

The primary responsibility of relief and rescue in the event of a disaster is that of the concerned state government. In view of the resource constraints of the state governments they have been provided with the additional support of funds set up at national level. However, they also make provision for funding relief. As, mentioned above, they contribute to CRF. Besides that, at the state level we find two more resources-

### 8.2.1 Chief Minister's Relief Fund

Set up on the pattern of Prime Minister Relief fund, this fund becomes handy to provide immediate relief to the victims of disaster. Relief can be provided from this fund to the next of kin of elders, minors falling victim to the calamity. Contributions to this fund are and can be made directly by the people.

### **8.2.2 State Government Fund**

The concerned state government sanctions funds to meet relief funds from its resources, which include its share of various developmental and employment generation programmes. **Though this Fund is not exclusively for the benefit of disaster victims, it is an important and immediate source of finance for providing relief. In the event of a disaster too the cash doles for people who lost their houses, expenditure on providing household kits etc., were met from this**

### **8.3 International Agencies**

Government of India follows the policy of not issuing a formal appeal on its behalf, either directly or through any other agency, to attract relief. However, relief donated on a voluntary basis is accepted and acknowledged as a sign of international solidarity. Some important international agencies are mentioned below:

#### **The UN System**

The United Nations, through the organization under its aegis, coordinates international cooperation in the field of disaster management and mitigation. A disaster Management Team (UN-DMT) is convened and chaired by the UN resident coordinator in each disaster prone country. Composition of the Team depends on the types of disasters to which a country is prone and the organizations which are present in that country, working towards disaster relief.

The primary purpose of UN-DMT is to ensure a prompt, effective and concerted response by the UN system at country level in the event of a disaster. it also provides support in post-disaster rehabilitation and reconstruction process in addition to long-term disaster mitigation measures.

### **8.4 Need for the creation of Department of Disaster Management under Govt. of U.P.**

A separate Department of Disaster Management under Govt. of U.P. and separate allocation of budget for pre and post disaster activities for various disasters would be the best option for stream lining the disaster management initiative and activities in Uttar Pradesh.

## Chapter- IX

# Thunderstorm and Squall Disaster Specific Action Plan

### 9.1 Thunderstorm or squall risk assessment

Thunderstorm locally develops and dissipates for short duration of 30 to 45 minutes. Cumulonimbus cloud formation (that develops vertically) leads to thunderstorm. Squall develops when wind speed is from 30 to 60 km /hour and it lasts for a very short span of time from 1 minute to few minutes. The squall is very common type of storm in Uttar Pradesh and is very localized phenomenon. Owing to its sudden impact span that too for a very short duration of time and localized occurrence and almost non existent network of wind speed and direction monitoring instruments in Uttar Pradesh makes it very challenging for the fraternity of climatologist to precisely forecast the time and location of thunderstorm and squall. In Uttar Pradesh presently IMD, Gol has only one Automatic Weather Station in Lucknow and two Radio Sonde and Radio Wind RSRWs one each in Lucknow and Gorakhpur. This is absolutely insufficient for forecasting thunderstorm and squall.

### 9.2 Thunderstorm and squall response plan

The emergency measures of evacuation, search and rescue and relief are the important actions in disaster management. Once disaster occurs, disaster management machinery should plunge into action for rescue and relief operations. The Trigger Mechanism is a vital part of preparedness plan whereby the receipt of a signal of an impending disaster would simultaneously activate the mechanism of response and mitigation without loss of crucial time.

In the case of thunderstorm and squall the prediction and precise forecast is very difficult particularly in Uttar Pradesh where no doppler radar and no lightning arrester is installed. Presently only one automatic weather monitoring stations (of IMD) is based at Lucknow and this too is not meant for forecasting thunderstorm and squall.

Following Preparedness measures can help mitigate the effects of thunderstorm and squall:

- i) Allocation of separate funds by Agriculture Department for creation of proper storage facilities for harvested crops within or in the close proximity of crop fields .
- ii) Awareness generation among village level officials and workers of Department of Rural development and Revenue Department and

members of PRIs to facilitate the creation of proper storage facilities for harvested crops.

- iii) Awareness generation among masses specially farmers to initiate the community efforts for creation of such facilities.
- iv) Awareness generation among NGOs, CBOs/ self help groups to help the community to create storage facilities.
- v) Training and awareness generation programme for the officials of Nagar Nigam and municipalities for allocation of only safe sites for erecting hoardings by various government departments and private companies and adoption of designs of hoardings which can withstand wind of upto 80 km/hour.

Other aspects are Rapid Damage/ Loss Assessment for Emergency relief, documentation of damages and losses and reconstruction.

A strong R & D base for near real timely forecast of **thunderstorm and squall** is required with research infrastructure and trained and highly skilled manpower. A **significant improvement in R & D activities and addition to manpower in teaching and research institutions in the area of atmospheric science is required.**

State Crises Management Group (SCMG) may request Government of India to allocate additional funds to India Meteorological Department to install following state of the art instruments for forecast of thunderstorm and squall.

- Installation of at least 04 lighting arresters and 02 doppler radars to cover the entire Uttar Pradesh as well as surrounding areas for forecasting of thunderstorm and or squall. (Action: India Meteorological Department, Govt of India at the request of SCMG-U.P.)
- Establishment of Observation Recording Stations and their two way connectivity with lighting arrester/Doppler radars for real time recording and with State Emergency Operation Centre, Lucknow for dissemination of near real time warning about squall or thunderstorm. **(Action: India Meteorological Department, Govt. of India at the request of SCMG-, U.P.)**

State Crises Management Group (SCMG) may also request Government of India to equip IMD with other state of the art instruments to forecast thunderstorm and squall.

- Improving public awareness and human resource development **(Action: State Agricultural Universities and Krishi Vigyan Kendra).**
- Strengthening of institutional infrastructure including State EOC, District Control rooms. **(Action: SCMG & DCMG)**

- Monitoring strict adherence to the standards set for erecting hoardings along road side bridges and market places so that they can withstand high speed winds. (Action: Nagar Nigam & District Magistrate)
  - Developing and implementing forecast mechanism. **(Action: IMD, GoI)**
  - Strengthening of forecasting mechanism for thunderstorm and squall. **(IMD, GoI and Department of Space, GoI)**
- Creating financial supports for disaster mitigation.

### 9.2.1 Quick Response

Quick response will comprise following activities:

#### **Activation of Tehsil Crisis Management Group**

On the receipt of warning or alert from IMD, Divisional Commissioner/District Magistrate about the probable occurrence of a disaster, all community preparedness measures including counter-disaster measures will be put into operation. The occurrence of disaster would essentially bring into force the following:

#### **Establishing Emergency Communication**

An on going wireless communication with the Divisional Commissioner, District Magistrates and SSPs of the affected districts.

#### **Alerting the Hospitals**

Hospitals of the area should be alerted to keep their doctors and paramedical staff in readiness and should ensure the availability of beds facility, medicines, oxygen, bottles of saline water, life-saving drugs and medical expertise to persons injured due to falling of hoardings/sign boards, trees, poles and walls in the event of thunderstorm and or squall. The concept of Golden hour should be imbedded into the doctrine of Quick Reaction Teams and Medical Teams.

### 9.2.2 Recovery and Post Disaster Measures

Strict adherence by authorities to standards in water supply sanitation, excreta disposal, vector control, drainage stands, hygiene promotion standards and minimum standards in nutrition are is must for recovery of the community which has been rendered homeless or is severely affected by the thunderstorm and squall. **A brief account of these various standards for post disaster recovery of the affected community is given below.**



## Impact Assessment

Impact assessment to be carried out using scientific survey and assessment methods.

Compensation Claims should be amicably and judiciously settled. It should be ensured that no sufferer/victim is left unattended.

## Infrastructure Support

Temporary Shelter to be provided to affected people. Staggered response to be designed based on nature and scale of disaster, as well as response capacity. Priority to be given to individual household level shelter provision, upgradable to permanent houses through long-term rehabilitation phase. Relief camps to be established where individual household coverage not possible.

## Minimum standards in water supply and sanitation

In disaster situation, the people are affected by diseases related to inadequate sanitation and water supply. The aim would be to provide a minimum quantity of clean drinking water and to reduce faeco-oral diseases or exposure to vectors causing disease. Also, the responsibility for procuring water mostly falls on the women and children and their safe and easy access to these services is essential. Standards for water supply, excreta disposal, vector control, solid waste management, drainage and hygiene promotion are given below:

### Water Supply Standards

**Access and Water Quantity:** All people have safe access to a sufficient quantity of water for drinking, cooking and personal and domestic hygiene. Public water points are sufficiently close to shelters to allow use of the minimum water requirement.

#### Key indicators being:

- At least 15 liters of water per person per day is collected.
- Flow at each water collection point is at least 0.125 liters per second.
- There is at least 1 water point per 250 people.
- The maximum distance from any shelter to the nearest water point is 500 meters.

**Water Quality:** Water at the point of collection is palatable and of sufficient quality to be drunk and used for personal and domestic hygiene without causing significant risk to health due to water-borne disease, or to chemical or radiological contamination from short term use. Key indicators being:

- There are no more than 10 faecal coliforms per 100 ml at the point of delivery for disinfected supplies.

- Sanitary survey indicates low risk of faecal contamination.
- For piped water supplies to populations over 10,000 people, or for all water supplies at times of risk, water is treated with a residual disinfectant to an acceptable standard (e.g. residual free chlorine at the tap is 0.2-0.5 mg per liter and turbidity is below 5 NTU).
- Total dissolved solids are no more than 1,000 mg per liter (approximately 2,000 ms/cm electrical conductivity for simple field measurement), and water is palatable to users.
- No significant negative health effect due to chemical or radiological contamination from short term use, or from the planned duration of use of the water source, is detected (including carry-over of treatment chemicals), and assessment shows no significant probability of such an effect.

**Water Use Facilities and goods:** People have adequate facilities and supplies to collect, store and use sufficient quantities of water for drinking, cooking and personal hygiene, and to ensure that drinking water remains sufficiently safe until it is consumed. Key indicators being:

1. Each household has two water collecting vessels of 10-20 liters, plus water storage vessels of 20 liters. Water collection and storage vessels have narrow necks and/or covers.
2. There is 250 g of soap available per person per month.
3. Where community bathing facilities are necessary, there are sufficient bathing cubicles for bathing at an acceptable frequency and at an acceptable time, with separated cubicles for men and for women.
4. Where community laundry facilities are necessary, there is 1 washing basin per 100 people; private laundering areas are available for women to wash and dry undergarments and sanitary cloths (IGNOU, 2006).

### **Vector Control Standards**

**Individual and Family Protection:** People have the means to protect themselves from disease vectors and nuisance pests when they are estimated to be a significant risk to health or well-being. Key indicators being:

- All populations associated with a vector-borne disease risk have access to shelters equipped with insect control.
- Control of human lice is carried out to an agreed standard where louse-borne typhus or relapsing fever is a threat.

**Physical, Environmental and Chemical protection Measures:** The number of disease-bearing vectors and nuisance animals that pose a risk to people's health and well-being are kept to an acceptable level. Key indicators being:

- Vulnerable populations are settled outside the malarial zone.

- The population of malaria-bearing mosquitoes is kept low enough to avoid the risk of excessive malaria infection.
- Vector breeding or resting sites are modified where necessary and practicable.
- Rates, flies and other mechanical and nuisance pests are kept within acceptable levels.
- Intensive fly control is carried out in high-density settlements when there is a risk or presence of diarrhoea epidemic.

### **Drainage Standards**

- 1) **Drainage Works:** People have an environment that is acceptably free from risk of water erosion and from standing water, including storm water, flood water, domestic wastewater and wastewater from medical facilities. Key indicators being:
  - There is no standing wastewater around water points or elsewhere in the settlement.
  - Storm water flows away.
  - Shelters, paths and water and sanitation facilities are not flooded or eroded by water.
- 2) **Installations and Tools:** People have the means (installations, tools etc.) to dispose of domestic wastewater and water point wastewater conveniently and effectively, and to protect their shelters and other family or communal facilities from flooding and erosion. Key indicators being:
  - Sufficient numbers of appropriately designed tools are provided to people for small drainage works and maintenance where necessary.
  - Water point drainage is well planned, built and maintained. This includes drainage from washing and bathing areas as well as water collection points.
- 3) **Food Quality and Safety:** Food that is distributed is of sufficient quality and is safely handled so as to be fit for human consumption. Key indicators
  - There are no outbreaks of food-borne diseases caused by distributed food.
  - There are no unreasonable complaints about the quality of foods distributed from recipients or programme staff.
  - Suppliers of food commodities carry out regular quality control and produce commodities that meet the official government standards or Codex Alimentarius Standards (e.g. with regard to packaging, labeling, shelf life etc.).
  - All foods supplied are systematically checked by independent quality surveyors.

- Adequate storage structure is in place and proper management of store is conducted.
- Staff has adequate knowledge about potential health hazard caused by improper handling, storage and distribution of food.
- Food Acceptability:  
Foods that are provided are appropriate and acceptable to the population.

### **Donations: Material and Fund Mobilisation**

Set-up of donation coordination team.

Specifications for types, condition, packaging of donation material to be disseminated to donors and aid agencies. This information to be based on local conditions and practices as well as nature and scale of disaster. Information to be kept in readiness during La for immediate availability on onset of emergency.

Prepackaging as relief kits to avoid inconvenience at distribution point. Packaging units to be specified. Package colour codes to be specified. Loading plan of material in trucks to be specified to enable direct downloading and distribution at distribution site.

## **9.3 Relief Coordination**

### **a. Entry Points: Air, Road, Water, Rail**

All entry points to be manned by extension teams of ESFs that need to provide immediate exposure and guidance to personnel and material entering the area. Control rooms, information kiosks, briefing venues to be established at major points of entry in the affected area.

### **b. Decentralized Material Storage Points**

Material storage points to be planned in consideration of points of entry as well as points/channels of distribution.

Distribution logistics, time and distance functions, and storage security to be considered for location of material storage points.

### **c. Relief Material : Type & Quality**

Immediate dissemination of information regarding type, quality and packaging system of relief material should be carried out to educate the donors and aid agencies.

This information should be based on local conditions and practices, as well as the nature of the disaster. The information should be kept in readiness during L0 stage.

#### **d. Distribution Modes**

##### **Government**

Public distribution systems to be strengthened where operational, and activated where non-operational.

##### **Non-Government**

Coordination to be ensured in NGO distribution systems to avoid duplication of efforts.

NGO to play this role through NGO control rooms and information centers.

#### **e. Information Management**

Disaggregated information management system to be established to provide sector specific information based on ESF functions.

Information system to be operated through feeder links from ESFs to Central Control Room.

Assimilated, processed and appropriately packaged information to flow from Central Control through control rooms and information desks to all concerned information seekers.

#### **f. Media Management**

Media management to be done through designated media management team within the Control Room.

Media releases to be issued at periodic intervals. Media teams to be briefed and provided orientation at points of entry.

Communication facilities such as sat-phone time sharing to be made available to media tea

#### **Deactivation of L2 (back to L0)**

Once the situation improves, the local administration should make all necessary efforts and extend all possible support and encouragement to the locals to settle down properly, as in the pre disaster stage.

## Chapter- X

# Review and Updation of Plan

### 10.1 Important Dates

Date on which the Plan was last revised :

Date on which the Plan was last rehearsed :

Due dates for revision and rehearsal :

The above schedule, as decided should be strictly adhered to by all the districts and send timely feed back to the Relief Commissioner regularly.

In order to make the State Disaster Management Plan (SDMP) effective it must be disseminated at three levels :

1. To the central government departments, multilateral agencies (aid agencies), Defence services, state level officials.
2. To the district authorities, government departments, NGOs, other agencies and institutions within the state; and
3. To the general public through mass media.
4. The responsibility for dissemination of the plan to the various stakeholders at state level and to all the districts should be vested with the Relief Commissioner as well as through awareness programmes organised by each of the agencies participating in disaster management. The Relief Commissioner should also involve state-level NGOs in preparing suitable public awareness material to be distributed to the public.
5. In addition to dissemination of literature related to the SDMAP, the Relief Commissioner should ensure that disaster response drills are conducted by the district authorities and other agencies on a regular basis especially in the disaster prone areas.

### 10.2 Plan Evaluation

The purpose of evaluation of the State Disaster Management Plan (SDMP) is to determine the adequacy of resources, coordination between various agencies, community participation and partnership with NGOs.

The plan be updated when shortcomings are observed in organisational

structures or when technological changes render it obsolete. The plan can also be updated following reports on drills or exercises carried out.

A post-incident evaluation should be done after the completion of relief and rehabilitation activities, in order to assess the nature of state intervention and support, adequacy of the organization structure, institutional arrangements, operating procedures, monitoring mechanisms, information tools, equipment and communication systems.

Impact studies on the above operations for long-term preventive and mitigation efforts are to be undertaken.

At the community level, evaluation exercises may be undertaken to assess the reactions of the community members at various stages in the disaster management cycle and to understand their perceptions about disaster response.

### **10.3 Plan Update**

The State Disaster Management Plan (SDMP) is a “living document” and should be updated by the office of the Relief Commissioner every year in consultation with the State Crisis Management Group (SCMG) and High Powered Technical Committee. An annual conference for SDMP update shall be organised by Relief Commissioner. All concerned departments and agencies should participate and give recommendations on specific issues.

## **Resource Inventory and Events**

### **a. Annual Summary**

#### **Personnel**

#### **Government**

Response Machinery

Emergency services-medical, fire, police

Armed forces, para military, home guards, NCC, S&G

State Technical Committee

NGOs

NSS, Civil Defence

Universities, colleges, schools

Contact Addresses, Phones

PSUs

## **Corporate Sector**

### **b. Events**

April End Updating

May Drills

Surveillance Reports

Seminars, Conferences

Training Programme

### **c. Material & Equipment (with specifications & rates)**

Mobile Communication

Search & Rescue equipment

Road Clearing Equipment

Water Treatment

#### **Power Generators**

Medical Facilities

Basic Relief Material

Blankets, tents, utensils, food, water

- d. Number and list of districts where District and Tehsil Crisis Management Committees have been formed and number of seminars and training workshops organised in each of the district at various levels. District Disaster Management Action Plan prepared and updated or not.
- e. List of villages with in each district where village Disaster Management Committee have been formed.



## Chapter XI

# Coordination and Implementation

Many organizations play a very useful role in disaster management and can offer rapid response and willingness to help the situation improve on the disaster site. They offer immediately available communications from within and outside the disaster affected area, technical services, manpower, and financial support to categorize organization by their operating behaviour and fields of expertise in this way:

- a) NGOs with large resources have international support and can respond quickly with large amounts of supplies and services.
- b) Registered local organization run by social workers addressing local issues related to development, agriculture, education children, women etc.
- c) Religious bodies: they band on their faith generally organized around this temples for aid of a community, offering capabilities for shelter and mass feeding.
- d) Development technology related: these are usually in their own commercial research and development, but their equipment and expertise can be used in time of need in such areas as sanitation building technology etc.
- e) Occupation groups: groups such as medical association provide specialized services and generate specialized resources.
- f) Residents' association: these are important means of mobilizing the local community. They generate community participation in disaster relief as well as planning and disaster mitigation efforts.
- g) Educational institutions: private and government educational institutions play a critical role in reaching large parts of the population with information about preparing for and recovering from disasters. 3.
- h) Interest groups: groups such as the Rotary Club or the Lions Club make resource contribution during disaster events.

### 11.1 Religion Based Organizations

A large number of NGOs are religion based and have a very committed work force. The groups working at the community level usually get financial support from parent organizations. Religious beliefs and commitments make these groups very effective in rescue and relief operations. These religious groups generally own institutes / places of worship that are "Pucca" buildings, usually slightly away from the core habitation which can be used as shelters during disaster situation. These groups also often have necessary infrastructure and resources for mass feeding.

Some international and national religious institutions have a mandate on social activity and disaster management. These missions provide services

like social counseling and promote communal harmony. During disaster situation they, come forward for relief operations and also undertake reconstruction and restoration activities. Some of these organisations have technical professionals associated with them and have good training and other infrastructure. Their services, technical/professional expertise and training infrastructure could be fruitfully used for all disaster management activities.

The religious organisations can play crucial role in planning and preparedness through

- Creation of contingent funds for disaster management and generate resource from other agencies, patrons and individuals.
- Organising congregations and other cultural functions and in raising community consciousness on disaster preparedness.
- Organising awareness and skill development trainings on various aspects of disaster management

## 11.2 Bilateral Organisations

Bilateral agencies play a major role in disaster management and work through government as well as NGOs and other partner agencies. They provide resources for preparedness, research, networking and institution development, relief, reconstruction and rehabilitation. They can assist in making suggestions for possible changes in policies by sharing of disaster management applications in other parts of the world. In addition they can provide technical expertise and give support by mobilizing advanced rescue and evacuation teams from other countries during the time of extreme emergencies. These organisations carry out responsibilities in coordination with the Government of the affected country, other donor Governments, international organisations, UN agencies and NGOs.

## 11.3 Corporate Bodies

So far the role of corporate sector has been limited to relief and reconstruction activities following emergencies. Some business centers and corporate houses have special cells to take up relief activities. After super cyclone of Orissa many PSUs and corporate houses like NALCO, ONGC, SAIL, and TATA constructed dwelling houses for the affected families and the various business houses which are having industrial units, power plants and or are engaged in other business activities with in the territory of Uttar Pradesh shall be encouraged to become important stakeholders in the Disaster Management initiative in this state.

- ◆ The corporate sector can play an active role in preparedness and planning through raising community awareness in their respective project areas on various aspects of disaster preparedness

- ◆ Providing specialised equipments (earthmoving equipments, boats, etc.) for disaster response
- ◆ Mobilisation and creation of contingency fund for relief and recovery activities
- ◆ Provision of technical know-how to manage disasters (fires etc.) in the immediate aftermath of squall.

#### **11.4 UN Agencies:**

The UN resolution affirms that the humanitarian assistance must be provided in accordance with the principles of humanity, neutrality and impartiality. The UN has a central and unique role through the organizations under its aegis to coordinate, international co-operation in the field of disaster management and mitigation. Even though disaster management and mitigation rests on the National Government, the UN agencies are responsible for providing advice and assistance to the governments of member nations and responsible to mobilize and provide technical and material assistance according to its mandate and resources.

- A mandate issued by the UN general assembly for setting up of United Nations Disaster Management Teams (UN-DMT) to be convened and chaired by UN resident coordinators in each disaster prone nation. Essentially the composition of UN-DMT is determined by taking into account the types of disasters to which a country is prone to and capability of the organizations present in the country working in the area of disaster mitigation and relief. The primary purpose of UN-DMT is to ensure a prompt effective and concerted response in the event of a disaster
- Coordinate UN assistance to the Government in post disaster rehabilitation and reconstruction process
- Undertake long-term disaster mitigation measures

##### **11.4.1 UNICEF (United Nations International Children's Emergency Fund)**

UNICEF, assists in child health, sanitation and nutrition especially in emergency situations and has done creditable work at the time of many disaster in India and elsewhere in the world.

- Provision of emergency relief to the affected communities
- Immunization
- Restoration of health infrastructures
- Supply of educational and other infrastructures to the affected schools
- Restoration and augmentation of sanitation and drinking water facilities

- Establishment of child labour prevention school
- Supporting NGOs in disaster mitigation and preparedness activities

The key areas of UNICEF's involvement in disaster mitigation will be

- ◆ Post disaster situation and needs assessment with the help of NGOs or Govt. machinery.
- ◆ Promoting & guiding disease surveillance
- ◆ Training support for medical personnel for control of epidemics
- ◆ Provision of relief support to the affected community as per its mandate.
- ◆ Supply of emergency food aid, medicine and study materials for children of the affected communities.
- ◆ Allocate/generate financial assistance for restoration and rehabilitation activities in the affected areas.
- ◆ Restoration of drinking water and sanitation facilities in post disaster period.
- ◆ Incorporate disaster preparedness aspects in its ongoing programs.
- ◆ Special programmes for child and mother health

#### **11.4.2 UNDP (United Nations Development Programme)**

UNDP is mandated to promote incorporation of disaster mitigation in development planning and provide financial support and technical assistance for different facets of disaster management. Assistance is also provided in the planning and implementation of post disaster rehabilitation and reconstruction and incorporation of risk reduction techniques in the affected areas.

Following the Super-cyclone in 1999, UNDP took a lead in coordinating and facilitating relief and rehabilitation efforts of various agencies.

UNDP plays the role of convener of the UN's DMT which is an inter-agency working group and works on disaster management in collaboration with Govt. and NGOs.

The activities of UNDP in the State are

- Co-ordination of NGO activities in the affected areas
- Promotion of alternative housing techniques in the affected areas
- Strengthening of disease surveillance
- Supporting Disaster Preparedness initiatives in the State through organizing workshops, training programmes for various stake holders

- Initiating community based disaster preparedness programme in the State
- Initiation of sustainable livelihood programmes, agro service centers
- Provision on agricultural inputs immediately after emergencies
- Provision of tents, family relief kits

UNDP can play the following roles in a disaster management;

- ◆ Incorporation of disaster mitigation in development planning.
- ◆ Support and get involved in planning and implementation of relief and rehabilitation activities of the Govt.
- ◆ Propagate disaster preparedness in community level through NGOs, CBOs, PRIs and Govt. machinery.
- ◆ Play a vital role in preparing disaster management plans at state, district, block and community levels.
- ◆ Play a vital role in designing early warning systems.

#### **11.4.3 WFP (World Food Programme)**

World Food Program provides targeted food aid to vulnerable community for humanitarian relief and supports rehabilitation, reconstruction and risk reduction development programmes. WFP in collaboration with State Govt. provides food support under the ICDS scheme.

#### **11.4.4 FAO (Food and Agriculture Organisation)**

FAO provides technical advice in reducing vulnerability and helps in the rehabilitation of agriculture, livestock, fisheries and local food production. It also monitors food production and forecasts any requirements of exceptional food assistance.

#### **11.4.5 WHO (World Health Programme)**

WHO provides advice and assistance in various aspects of preventive and curative health care including preparedness of health services for rapid disaster response. WHO played a major role in initiating and strengthening the disease surveillance system in the cyclone affected Districts of Orissa shortly after the Super Cyclone.

## **Integration of the Media into Disaster Mitigation Activities and during disasters**

- a) The second step in building links with the news organizations is to more effectively link the media into an intensified effort in disaster mitigation, including such activities as
  - Risk assessment
  - Avoidance measures
  - Early warning and evacuation
  - Public awareness and education
  - Organization for self-help and effective response to risk.
- b) The media are seen as relayers of official information and measures, which the citizens are expected to undertake immediately and at the same time are conduits for relaying information through inter-governmental structures and channels, to bring the citizens, concerns to official attention.
- c) In the event of a disaster, media has a responsibility of reporting the same on a day-to-day basis. Such reporting can contribute to
  - Bringing true stories of disaster to public
  - Stimulating public response to needs and sufferings caused by disaster
  - Drawing attention of concerned departments and agencies.
  - Improving efficiency by reducing response time
  - Motivating public and generating disaster assistance and resources.
- d) However, care should be taken to safeguard the authenticity of the information and the credibility of the media. This can be done by
  - Avoiding reinforcing stereotypes that the people carry about disaster “victims”
  - Promoting sensitivity as against sensationalism
  - Highlighting both the positive and the negative aspects of disaster management
  - Cross-checking information from the disaster site as well as the official sources.

During disasters, it is important to organize regular press meetings and issue press releases. The importance of the coordinated efforts of various

non-governmental agencies engaged in relief operations and the community should be highlighted through such briefings. This will ensure highlighted transparency in all operations, concern, and commitments to those affected.

A rational approach to media involvement in disaster management would include familiarization of media about preparedness activities and action plans for disaster management, roles and responsibilities, strengths and limitations of media. This will prepare the ground for utilising the technological and human resources available with mass media. Tapping the media's capabilities can, and will improve the preparedness and response to disasters. Conversely, the study and application of disaster mitigation techniques can enhance the quality of, and interest in the services the media can provide. The media have the definitive opportunity to play a leadership role in the transition in thinking and action away from post-disaster relief and towards, preparedness and disaster mitigation.

## References and further reading

Albert Irvin Frye (1913). *Civil engineers' pocket book: a reference-book for engineers, contractors*. D. Van Nostrand Company. p. 462.

Carter, W. Nick, 1991. *Disaster Management: A Disaster Management Handbook*, Asian Developmentbank, Manila.

Chris C. Mooney (2007). *Storm world: hurricanes, politics, and the battle over global warmin*. Houghton Mifflin Harcourt. p. 20. ISBN 9780151012879.

David O. Blanchard (September 1998). "Assessing the Vertical Distribution of Convective Available Potential Energy". *Weather and Forecasting* (American Meteorological Society) 13 (3): 870–7. doi:10.1175/1520-0434(1998)

Draft State Disaster Management Action Plan of Uttrakhand

FMI (2007). "Fog And Stratus - Meteorological Physical Background". Zentralanstalt für Meteorologie und Geodynamik.

<http://www.zamg.ac.at/docu/Manual/SatManu/main.htm?/docu/Manual/SatManu/CMs/FgStr/backgr.htm>. Retrieved 2009-02-07.

Government of India, Ministry of Agriculture, Department of Agriculture and Cooperation, 2001, *National Disaster Response Plan: A Document prepared by the High Powered Committee on Disaster Management*, New Delhi.

Government of India, Ministry of Home Affairs, *Handbooks and compendium of Instructions of Civil Defense*, New Delhi.

IGNOU (2006). *Disaster Response* (PGDDM study material), IGNOU, New Delhi Publication.

Micheal H. Mogil (2007). *Extreme Weather*. New York: Black Dog & Leventhal Publisher. p. 210–211. ISBN 978-1-57912-743-5.

Maharashtra State Disaster Management Action Plan

National Severe Storms Laboratory (2006-10-15). "A Severe Weather Primer: Questions and Answers about THUNDERSTORMS". National Oceanic and Atmospheric Administration.

[http://www.nssl.noaa.gov/primer/tstorm/tst\\_basics.html](http://www.nssl.noaa.gov/primer/tstorm/tst_basics.html). Retrieved 2009-09-01.

National Weather Service (21 April 2005). "Weather Glossary - T". National Oceanic and Atmospheric Administration.

<http://www.weather.gov/glossary/index.php?letter=t>. Retrieved 2006-08-23.

National Severe Storms Laboratory (September 1992). "tornadoes...*Nature's Most Violent Storms*". *A PREPAREDNESS GUIDE*. National Oceanic and Atmospheric Administration.

<http://www.nssl.noaa.gov/edu/safety/tornadoguide.html>. Retrieved 2008-08-03.

Orissa State Disaster Management Action Plan



Uttar Pradesh Disaster Management Act, 2005

Uniyal, A. (2003). "Overview of Mitigation Strategy". Proceedings of Workshop on State Disaster Management Strategy under GOI-UNDP Disaster Risk Management Programme in Uttarakhand (2003-2007) organized by Disaster Mitigation and Management Centre Uttarakhand Secretariat, Dehradun pp 12-15.

Uniyal, A. and Prasad, C., (2006). "Disaster management strategy for mass wasting hazard prone areas in Upper Tons valley, Uttaranchal (India)". *Disaster Prevention and Management: An International Journal*. Vol.15, No. 5,2006; pp.821– 837.

Uniyal, A. (2007). "Geographical Information System as decision support tool for disaster risk reduction", Abs. Vol.. *Nat. Conf. on RS and Surface Processes*. Organised by Centre for Advance Studies in Geology, University of Lucknow, pp 65.

Uniyal, A. (2008). "Prognosis and mitigation strategy..". *Disaster Prevention and Management: An International Journal*. Vol.17, No. 5, pp622–644.

Vulnerability Atlas of India (1997).. BMTPC, Gol, Nirman Bhavan, New Delhi

[http://en.wikipedia.org/wiki/Dust\\_storm](http://en.wikipedia.org/wiki/Dust_storm)

<http://en.wikipedia.org/wiki/Thunderstorm>

[http://www.thaindian.com/newsportal/lifestyle/squall-claims-45-lives-inuttar-pradesh\\_10048865.html](http://www.thaindian.com/newsportal/lifestyle/squall-claims-45-lives-inuttar-pradesh_10048865.html)

<http://news.oneindia.in/2008/05/15/squall-claims-45-lives-uttar-pradesh-1210831500.html>

<http://saarc-sdmc.nic.in/latest57.asp>

[http://www.thaindian.com/newsportal/enviornment/dust-storm-leaves-sixtydead-in-uttar-pradesh\\_10048964.html](http://www.thaindian.com/newsportal/enviornment/dust-storm-leaves-sixtydead-in-uttar-pradesh_10048964.html)

[http://www.thaindian.com/newsportal/enviornment/hailstorm-thundershowers-claim-20-lives-in-uttar-pradesh\\_100191334.html](http://www.thaindian.com/newsportal/enviornment/hailstorm-thundershowers-claim-20-lives-in-uttar-pradesh_100191334.html)

[http://www.thaindian.com/newsportal/enviornment/17-killed-in-uttar-pradesh-storm\\_10053234.html](http://www.thaindian.com/newsportal/enviornment/17-killed-in-uttar-pradesh-storm_10053234.html)

<http://news.indiainfo.com/2003/06/12/12squall.html>

Vinson Kurian (2008) <http://www.blonnet.com/2008/04/05/stories/2008040551911200.htm>

<http://www.latestnewsonline.net/india/20-perish-in-rains-in-uttar-pradesh-north-sweats/15236.html>

<http://www.newkerala.com/nkfullnews-1-41635.html>

<http://www.hinduonnet.com/2007/05/07/stories/2007050708130100.htm>

<http://www.thehindu.com/2002/05/12/stories/2002051202590700.htm>

<http://www.hindu.com/2009/05/08/stories/2009050859350300.htm>

<http://www.religie24.nl/asp/default.asp?t=article&newsid=177463>

<http://www.samaylive.com/news/13-more-perish-in-rains-north-continues-to-sweat/629321.html>

<http://www.financialexpress.com/news/dust-storms-hit-mango-output-in-uttar-pradesh/312789/>

weather code of IMD (1982)

Yikne Deng (2005). *Ancient Chinese Inventions*. Chinese International Press. pp. 112–13. ISBN 9787508508375.

[http://books.google.com/books?id=ssO\\_19TRQ9AC&pg=PA112&dq=Kongming+balloon](http://books.google.com/books?id=ssO_19TRQ9AC&pg=PA112&dq=Kongming+balloon). Retrieved 2009-06-18.

**Feedback Form**

**1. About you :**

**2. Your Experience on using this Plan :**

**3. Comments :**

**4. Suggestions for improvement :**

- 
- 
- 
- 
- 
- 
- 

**5. Send this form to : The Director,  
Remote Sensing Applications Centre  
Sector-G, Kursi Road  
Lucknow – 226021**

**Annexure - I**

**Emergency Telephone & Address Directory (to be prepared and updated by  
functionaries of State Emergency Operations Centre)**

<b>Name of key functionaries</b>	<b>Office Address</b>	<b>Residential Address</b>	<b>Mobile No.</b>	<b>Office Phone No.</b>	<b>Residential Phone No.</b>