

# NATIONAL INSTITUTE OF DISASTER MANAGEMENT



## INDIA DISASTER REPORT 2012



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**National Institute of Disaster Management  
2013**



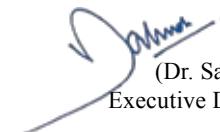
**Dr. SATENDRA, IFS**  
*Executive Director*

## FOREWORD

The National Institute of Disaster Management, constituted under the Disaster Management Act 2005 has been entrusted with the responsibility of human resource development, capacity building, training, research, documentation and policy advocacy in the field of disaster management. It becomes imperative to compile a database and document past disasters so that the above mentioned functions entrusted to the Institute can be carried out effectively. Documenting a disaster also helps in reviewing and analysing the challenges faced by the country and the emerging trends it observed during the past while dealing with disasters. The reflection of the past disasters would help in illustrating vital lessons to be learnt so that the future disasters can be handled cautiously and confidently.

Disasters may result in huge loss in life and damage to infrastructure, resulting in wiping out decades of developmental gains. However, economic damage is not a conclusive and holistic indicator of the impact of a disaster. It depends a lot on the developmental standard of the country affected. In developing countries, the economic loss may be small, but this may form considerable percentage of country's Gross Domestic Product. Disaster can undermine development investment and cause terrible human suffering, especially in communities that are fragile and lack resilience. The resultant devastation highlights the need for increased commitment and investment in disaster risk reduction. The implementation of sound disaster management laws and policies can play an important role in mitigating the negative effects of disasters and can contribute to the development of more resilient societies. The lessons learned from disasters and its management will certainly help and guide for making necessary changes and amendments in our policies, laws etc., so that we can manage disasters more effectively and efficiently.

Keeping this in view, NIDM had initiated the process of compiling Annual Disaster Report in 2011. We take this initiative and legacy forward by bringing out the Annual Disaster Report in 2012. It is expected that the continuous compilation of disaster data and its analysis would provide us with valuable information and trends on the occurrence of natural disasters and their impacts on society. As an institute working towards a disaster resilient country, we need to regularly re-evaluate what is working in the concerned sector, what needs to be improved and what kind of preparedness measures are required for exigencies, which are not very apparent to us. Doing this together fosters a collective commitment to make our organization stronger and better positioned as an academic institute with the interests of the vulnerable populace constantly in our minds.



(Dr. Satendra)  
Executive Director

आगर उचित है आपदा प्रबंधन, तभी मिलेणा विकास को धन।



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## 1. INTRODUCTION

The India Disaster Report (IDR) was started as an annual documentation effort from the year 2011, covering the major disaster events from January to December of each year in the country. When launching the maiden issue it was decided that this report will discuss major disasters of each year for which the state governments had requisitioned the Central Government for supplementary support. Further to this some unique disaster events were discussed which reported huge loss of lives and there was a lesson to be learnt from them. The list of disasters in which 10 or more human lives were lost was annexed at the end of the report under three headings Road Accidents, Extreme Weather Events and Others, along with NIDM activities. All these are covered in this issue also.

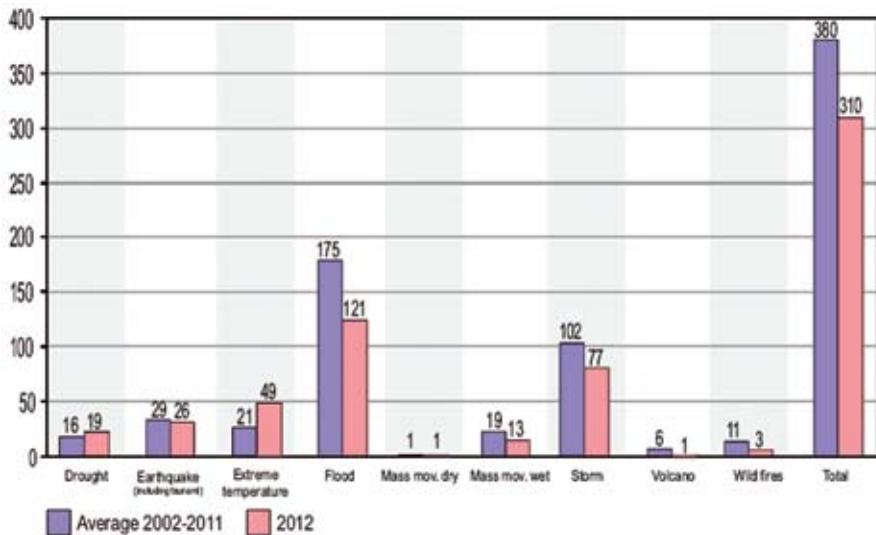
The first issue of IDR received good appreciation from various quarters for initiating such documentation process and was also cited in many web sites and referred by various stake holders working in Disaster Management sector. This has encouraged the NIDM to further strengthen this process with the help of Ministry of Home Affairs, Government of India. Further, it is to be realized that the study of Disasters, has relevance not only for the fact that it is to be documented but also for those in Disaster Management to learn from these events and use these lessons as an opportunities for development.

All the figures quoted in the text and tables, are mainly taken from the Memorandum's submitted by the respective State Governments, and are provisional, as these figures were not supplied primarily for documentation, and only based on preliminary reports and enquiries. Other figures quoted are given source of information, where ever possible.

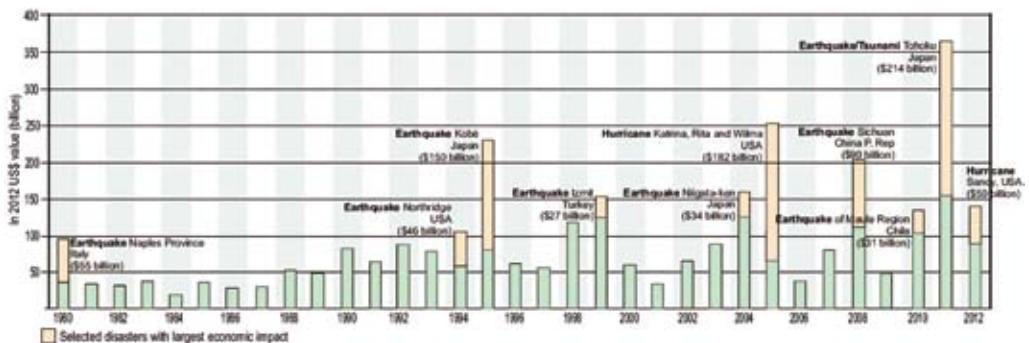
### **Disaster Data:**

The review of the World's disaster in the year 2012 reveals, 310 natural disasters were recorded in EM-DAT database in 2012, affecting 115 countries, claiming 9,930 lives, affecting 106 million people and causing economic damages worth

US \$ 138 billion (CRED CRUNCH, 2013). Figure 1 depicts the occurrence of Natural disasters of different types and Figure 2 depicts the annual reported economic damages due to disasters between 1980 and 2012.



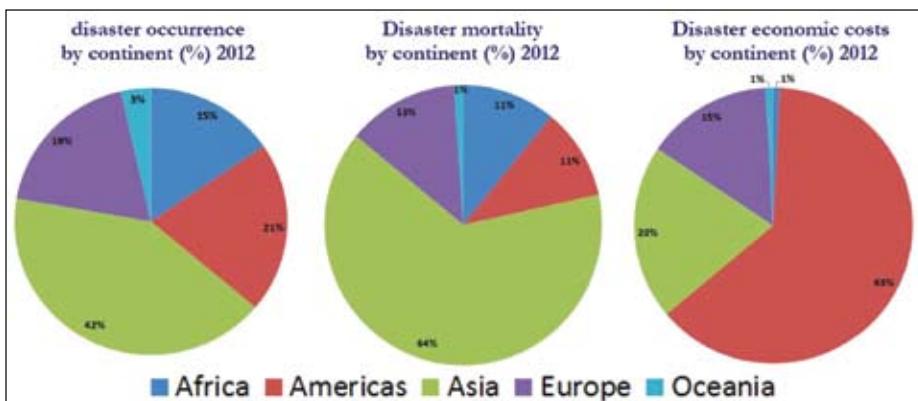
*Figure 1: Occurrence of Natural Disasters by different types  
(Source: CRED CRUNCH, 2013)*



*Figure 2: Annual reported economic damages from disasters during 1980- 2012  
(Source: CRED CRUNCH, 2013)*

As evident from these figures, once again Asian continent was the most affected by natural disasters, in terms of occurrence, persons killed and persons affected. As per EM-DAT, 2013, 42% of the natural disasters occurred in Asia and 64% disaster mortality was in Asia in the year 2012 (Figure 3).

India appears fourth among the 10 most affected countries from the Human Impact point of view with 483 deaths being reported by EM-DAT, with Phillipines topping the list with 2360 deaths. India also stands fifth on the list of number of people affected with 4.3 million people being affected due to disasters, as per EMDAT (CRED CRUNCH, 2013).



*Figure 3: Disaster Occurrence, disaster mortality and economic loss due to disasters by Continent in percent for the year 2012  
(Source: CRED CRUNCH, 2013).*

### Indian Scenario:

The year 2012 witnessed more disasters in Himalayan region, mainly in the states of Assam, Uttarakhand and Himachal Pradesh. Assam had to face natural disasters such as flood, which hits the state almost every year, forcing the people to adapt to “living with the floods”. This year the floods of Assam claimed 149 precious lives apart from the damages to property and infrastructure. Main issue of floods in Assam is that it also takes a toll on erosion, eroding away agriculture land. Assam also had to face human induced disasters during this year i.e. boat tragedy, which is covered in this report. The south west monsoon showed its fury in the northern part of the country, especially in the Himalayan region this year. Thus, the heavy rains and flash floods of Himachal Pradesh and heavy rains of Uttarkashi district of Uttarakhand also find place in this report. The heavy rains resulting in flash floods in Himachal Pradesh, claimed 29 precious lives apart from damages to roads blocking the traffic. The heavy rains in Uttarkashi especially during the peak pilgrimage time also caused havoc to infrastructure claiming 34

precious lives, though the rescue operation could save many pilgrims along with local population.

The cyclone as last year again hit the eastern coast of the country. Through it had a land fall in Tamil Nadu, it damaged some parts of Andhra Pradesh due to heavy rains claiming 61 lives. This issue also covers rail accidents in which the casualty toll was recorded to be 28 people have died and 25 were injured. The report also covers unmanned railway crossing deaths which amounts to a large part of the deaths resulting from accidents. This portion deals with the necessity of awareness among public when they cross the railway line. The lessons learnt from this disaster is a separate chapter of the report.

### **References:**

CRED CRUNCH, 2013, Disaster Data: A Balanced Perspective, Centre for Research on the Epidemiology of disasters (CRED), Issue No.31, March, 2013.

## 2. ASSAM FLOODS

Floods are a recurring phenomenon in Assam, as 45% of its area is prone to floods. Apart from the heavy **rainfall** that occurs in the State, the Brahmaputra and its tributaries and the Barak river and their tributaries swell up during the monsoon on account of rains in the upper reaches of the catchment areas of various rivers, which include China, Myanmar and Bhutan, besides the neighbouring states of India i.e. Arunachal Pradesh, Meghalaya and Nagaland.

### **Overview**

The state witnessed massive floods in June and September 2012. Incessant rainfall during the month of June 2012 and from 15th September to 27th September 2012, which was 24 % and 47 % above normal respectively, was one of the reasons for the enormous floods in Assam. Moreover, what was striking was that the rainfall activity was unusually extreme on four days of June 2012 viz. 25th, 26th, 27th and 28th and four days of September 2012 viz. 20th, 21st, 22nd and 23rd. The state of Arunachal Pradesh also witnessed very heavy rainfall during this specific period. The flood mainly occurred in three phases in Assam.

#### **April-May 2012 : First Wave of Floods**

Flood occurred in the district of Karimganj in the month of April 2012. Later in the month of May, a flood occurred in Lakhimpur district. However, the duration and magnitude of the first wave of floods was very less affecting a population of 4068 only and no relief camps were opened during this phase.

#### **June-August 2012 : Second Wave of Floods**

In the second wave of Floods, all the 27 Districts of Assam were affected. The most devastating phase came on 24th June 2012 due to incessant rainfall in the catchment areas of Brahmaputra (Table-1) (particularly in China and Arunachal Pradesh region) and its tributaries originating from Arunachal Pradesh and

Bhutan, water levels of all rivers started rising and crossed the danger level. Thus, the water level of the river Brahmaputra rose alarmingly and crossed the danger mark at Dibrugarh, Jorhat, Tezpur, Guwahati, Goalpara and Dhubri. The water level of the Brahmaputra during the month of June was recorded to be the highest since 1988, 1998 and 2004 at different locations. Besides the river Brahmaputra, the level of different tributaries i.e., Dikhow, Jiabharali, Kopili, Bharalu, Puthimari, Champamati, Aai, Gaurang, Beki, Manas, Pagladia, Saktola, Nonoi, Subhansiri, Singra, Charikhuria, Dikrong, Durpang and Jiadhai also rose above the danger level.

**Table 1: Rainfall in June 2012 – Assam**

Date	Actual (mm)	Normal (mm)	Departure (%)
24.06.2012	15.3	15	2
25.06.2012	35	14.2	+145
26.06.2012	70	13.8	+406
27.06.2012	210.9	104.1	+103
28.06.2012	21	13.1	+60
29.06.2012	0.7	12.2	(-)94
30.06.2012	0.2	13.8	(-)99

*(Source: Government of Assam)*

During the heavy rainfall in the state in June 2012, water either overtopped the embankments or breached the same causing large scale inundation within a very short timespan. The embankments of various rivers were breached at 65 places and as the breaches widened with time, more areas were affected due to inundation. Heavy flood occurred in the districts of Dibrugarh, Jorhat, Sonitpur, Nagaon, Golaghat, Morigaon, Kamrup (M), Kamrup, Goalpara, Dhubri, Bongaigaon, Barpeta, Darrang, Lakhimpur, Dhemaji, Tinsukia, Sibsagar, KarbiAnglong, Kokrajhar, ChirangBaksa, Nalbari and Udaguri. The Barak river and its tributaries Kushiyara, Kathakal & Matijuri caused floods in the three districts of Cachar, Hailakandi & Karimganj. The rainfall also triggered 27 landslides in three districts of Assam, worst affected were Dima, Hasao and Kamrup (Metro). 16 people lost their lives in these landslides.

### **September 2012 : Third Wave of Floods**

Barely had the State recovered from the devastating floods of June 2012, the State was again struck by another enormous flood in the third week of September 2012 due to heavy rainfall (Table-2). Twenty districts of Assam have been flooded due to incessant rainfall in the catchment areas affecting a population of nearly 29.14 lakh population in 2594 villages of 94 Revenue Circles.

**Table 2: Rainfall in September 2012 - Assam**

Date	Actual (mm)	Normal (mm)	Departure (%)
20.09.2012	34.3	7.3	+370
21.09.2012	28.3	7.6	+272
22.09.2012	19.2	7.7	+149
23.09.2012	14.7	10.2	+44

(Source: Government of Assam)

The heavy rainfall again caused havoc as the water entered from the already open breaches in the embankments and it also caused 9 fresh breaches. The affected districts were Dhemaji, Lakhimpur, Tinsukia, Dibrugarh, Sivasagar, Jorhat, Golaghat, Nagaon, Morigaon, Kamrup (M), Kamrup, Nalbari, Barpeta, Sonitpur, Darrang, Udaguri, Baksa, Goalpara, Dhubri and Bongaigaon.

### **Impact :**

The impact caused by the floods was devastating. Apart from loss of lives, the damage caused to infrastructure was enormous. An overview of the damage caused by floods is outlined below in Table-3.

**Table 3: Details of damages due to flood**

S.No	Items	Units	
		June 2012	September 2012
1	Total no. of Districts Affected	27	20
2	Number of Revenue Circles Affected	128	94
3	Villages Affected	4540	2594

4	Total Number of Population Affected	23.91 lakhs	29.14 lakhs
5	Crop area Affected	2.55 lakh hectar	3.28 lakh hectar
6	Human Lives Lost	112	37
7	Relief Camps Opened	768	1069

(Source: Assam State Disaster Management Authority)

The floods along with landslides damaged several National Highways. The most severe devastation was in locations where there were breaches in the embankments/dykes. There have been as many as **43 breaches by River Brahmaputra and its tributaries in 14 districts**. The dykes/embankments in various stages of disrepair were not strong enough to withstand the force of the surging river waters that were flowing above danger level. The obstruction of drainage because of infrastructure like roads and embankments has contributed to the submergence/inundation of extensive areas. Crucial rail line between Lumding and Badarpur was also damaged.

Water sources were reported to be contaminated in all areas. Ring well and tube-wells were submerged except at few places where they were constructed on higher ground or on elevated platforms. Floods also caused damage to the infrastructure of three National Parks viz. Dibru-Saikhowa, Kaziranga and Manas National Parks and three Wildlife Sanctuaries viz Pobitora, Laokhowa and Bura Wildlife Sanctuaries.

Fisheries which have been emerging in recent years as an important livelihood activity supplementing household incomes was not able to withstand the floods and restoration have proved to be very expensive to most families. About 812 Hectare Sericulture Plantation was affected, where about 10, 00,000 plants and 1580 rearing houses were also damaged. 5000 Km of Village internal roads, 500 Km of Irrigation Channel/Marginal Bund, 425 Drinking Water units and 50 Panchayat Ghars were also damaged due to flood. (**Assam State Disaster Management Authority**).

## Response

The floods of 2012 inundated many areas which were cut off from rest of the

landmass for one to three days. In the initial phase, Amarpur and Laika areas of Sadiya subdivision in Tinsukia district and later certain parts of Sonitpur district could not be approached for one or two days. SDRF, NDRF, Army and Air Force rescued people and evacuated them to safer areas. As per estimate over 3,70,265 people were evacuated all over the State using boats from the Army,



*Figure 1: Helicopter and boat are used in rescue operation and distribution of food  
(Source: website of ASDMA)*



*Figure 2: Jawans helping in rescue operation  
(Source: Website of ASDMA)*



*Figure 3: Marooned people near river bank  
(Source: Website of ASDMA)*

NDRF, ASDMA and private boats (Figure 1 & 2). In some areas of Tinsukia and Sonitpur districts food had to be airdropped initially till boats could reach the marooned people as the river currents were too strong for boats to negotiate in the initial 24 hours (Figure 3).

A massive relief operation was undertaken in all the districts immediately. Relief Camps were opened and Gratuitous Relief (GR) distributed for immediate relief.

At one point, in June 2012 total no of relief camps that were operational in the State was nearly 768 with over 4.85 lakh people. Apart from the people in relief camps, a large number of people also shifted to roads and embankments. Drinking water, sanitation, health and veterinary services were provided in the relief camps and affected villages.

In September 2012, 1069 Relief Camps and 176 Shelters were set up with over 5.43 lakh people. A total amount of Rs 165.90 crore was given to the districts and subdivisions for providing GR to the flood victims.

Post flood situation creates more problems, especially relating to health and sanitation. People who lost their homes have to defecate in the open. The dead bodies of human beings, cattles, as well as wild animals that have been washed out by flood tends to contaminate the ground water. This increases the risk of water-borne diseases in the flood-affected areas. In the past, a huge section of the population of Assam got afflicted to diseases like malaria, typhoid and cholera, just after devastating floods. The Government mobilised teams comprising of health workers from its departments who visited camps and provided first aid and medicines. Due to the effective measures taken by the Health department, fortunately there was no outbreak of any diseases in the relief camps. For ensuring safe drinking water the Public Health Engineering Department (PHED) distributed water purifying packets, disinfected submerged spot sources, open wells, as well as restored defunct sources (Figure 4). About 6,44,173 water purifying packets consisting of lime, alum and & bleaching



Figure 4: In search of Safe drinking water  
(Source: Website of ASDMA)

powder were distributed; 3,15,000 bleaching powder packets were distributed, 10,28,001 Halogen tablets were distributed, 1594 Spot source installed, 4526 Spot source repaired, 43,691 spot source disinfected, 862 toilets constructed at Relief camps and 682 ponds were disinfected. The Department also undertook sensitization programmes on various types of hygiene practices during and after flood and educative 1,26,869 educative leaflets were also distributed among the people. Further, for ensuring proper sanitation facilities low cost sanitation facilities were also installed.

After the devastating floods of June 2012, a six member inter-ministerial central team led by Shri G.V.V. Sharma, Joint Secretary (F), Ministry of Home Affairs was deputed by Government of India for on the spot assessment of the damage and the admissibility of supplemental central assistance to the State. The Government of Assam presented a Flood Memorandum to the team seeking Rs 3986.26 crore as special assistance under NDRF and Rs 11092.12 crores as additional special package for the State. The Prime Minister of India, Dr. Manmohan Singh visited the Flood affected areas of Assam on 1st July 2012 and announced a special package of Rs. 500 crores for the flood hit victims of Assam.

Assam State Disaster Management Authority (ASDMA) in collaboration with North Eastern Space Application System (NESAC) had set up the Flood Early Warning System (FLEWS) in 14 districts of Assam. On the basis of the hydro-met analysis NESAC issued an advisory along with the names of the flooding rivers as well as the likely areas to be affected by floods. This warning was conveyed to the Deputy Commissioner's of the concerned districts as well as to the Circle Officer's of the concerned Revenue Circle's. But, in spite of these warnings, it was observed that the community suffered severely due to floods this year. This perhaps, was due to the absence of the Standard Operating Procedure clearly outlining the actions that needs to be taken by the Deputy Commissioner and the Circle Officer on receipt of the warning from NESAC and the State Control Room. The early warnings issued to the districts and revenue circles could not be conveyed to the concerned community due to lack of established procedure. Therefore, the need for a mechanism for last mile connectivity is very much required.

Among the death that occurred in the floods, 68.75 per cent were children and women. This calls for a more sustained awareness campaigns targeted for

the children and womenfolk on the do's and don'ts during floods. Awareness generation on do's and don'ts during flood has to be taken up for the better safety of this group.

One of the major challenges while dealing with any natural calamity is its unpredictability, and the inevitable element of surprise. However, if an impending catastrophe is predictable, steps can be taken in a direction, which might actually help in either overcoming it, or at least reducing the losses to a minimum. Assam is highly vulnerable to floods. Although the magnitude of the floods may vary, a majority of the districts of Assam are submerged every year by flood waters. Given its predictability, one might assume that this disaster is, on a whole, avertable. We do not have to wait for the predictable disaster to actually strike and to evoke a programmed reaction of relief and rescue from the authorities. Assam continues to face the wrath of floods till now. The amount of money that is spent on relief, if spent on infrastructural development to prevent floods could not only reduce the loss of life and property, but would also be economically viable for the authorities. Some of the priority mitigation measures can be construction of hand pumps at an elevated level in each village in an area which never gets inundated or remains competitively less submerged in flood water, which can be used for drinking purpose during flood in addition to normal time.

## References

1. Assam State Disaster Management Authority (ASDMA), (2013). Towards a Disaster Resilient Assam: Floods in Assam 2012, Government of Assam.
2. Das, D.C. 2000. Agricultural Landuse and Productivity Pattern in Lower Brahmaputra valley (1970-71 and 1994-95). Ph.D. Thesis, Department of Geography, North Eastern Hill University, Shillong.
3. Mipun, B.S. 1989. Impact of Migrants and Agricultural Changes in the Lower Brahmaputra Valley: A Case Study of Darrang District. Unpublished Ph.D. Thesis, Department of Geography, North Eastern Hill University, Shillong.
4. Shrivastava, R.J. and Heinen, J.T. 2005. Migration and Home Gardens in the Brahmaputra Valley, Assam, India. Journal of Ecological Anthropology 9: 20-34.

### 3. HEAVY RAIN IN UTTARKASHI

#### **Introduction:**

South west monsoon of the year 2012 brought heavy rains to the northern region of the country, to the extent some places witnessed cloud burst leading to flash floods and number of landslides, especially in the state of Uttarakhand. This write up is based on the field visit report of Dr. Surya Prakash, Associate Professor of NIDM supplemented by the Memorandum submitted by the Government of Uttarakhand.

Uttarkashi is one of the 13 districts of Uttarakhand which is a multi-hazard prone state, prone to many natural hazards. Along with natural causes to increased vulnerability to disasters, the State of Uttrakhand is socio-economically also very vulnerable as twenty nine percent of the people living in the Indian part of this Himalayas have income below the national poverty line with an annual population growth rate of 1.4 % and infant mortality rate of 63 per 1000 live births (Shrestha and Bajracharya, 2013).

During the year 2012 Uttarkashi district received abnormally high rainfall and incidences of localized concentrated precipitation (cloudburst) occurred between 4th and 6th August, 2012 in the upper catchment of the tributaries of Bhilangana river, particularly Assiganga and Swarigad (Disaster Relief Memorandum for Central Assistance, Government of Uttarakhand). This unprecedented rain fall resulted in rise in the waters of Bhagirathi River at Uttarkashi as also in upstream areas by as much as 04 meters above the danger level.

#### **Monsoon of 2012 & Causes of flood:**

In the year 2012 the monsoon was relatively weak and both during June and July the rains were deficient throughout the state. However, heavy and concentrated rainfall occurred in the month of August. Particularly high rainfall was received in the first week of August, especially in Uttarkashi district between 4th and 6th

August, 2012. Cloudburst in the early hours of 4th August, 2012 in the catchment of the tributaries of Bhagirathi River, particularly Assiganga and Swarigad, resulted in rise in water level in Bhagirathi, as much as 04 meters above the danger level. Water level thus rose to 1127 meters above mean sea level (m.a.m.s.l) as against danger level of 1123 m.a.m.s.l. This resulted in widespread devastation in the district and even affecting the district headquarter.

The rainfall resulted in blockage of drainage channels due to tree logs, sediments and boulders for some period of time, thereby forming transient lakes in some of the tributaries of Asiganga and Bhagirathi rivers. These transient lakes bursted on 3rd August 2012 bringing in huge volumes of water, sediment, boulders and tree logs into the Bhagirathi River and its tributaries like Asiganga. This area had also received very heavy precipitation on 4th and 25th July 2012 in the Asiganga valley resulting in a big transient dam due to the debris (sediment, boulders and tree logs) in these channels. Apart from these, transient dams and lakes along these channels, the existing lakes like Dodi Tal, located on the upstream side were also filled with water due to these cloudburst events. The narrow basin of Asiganga river is long valley with a huge watershed area with a good potential for flashfloods, landslides and debris flows. However, though the river Bhagirathi is a wider valley compared to Asiganga, the water is fed to this by numerous other tributaries and Gangotri glacier on the upstream side. This resulted in both Asiganga and Bhagirathi having heavy discharge in the river resulting in the disaster (Surya Prakash, 2012).

### **Impact:**

The river flow at high velocity mixed with heavy sediments resulted to toe erosion of the slope adjacent to riverside. The loss of toe support resulted in numerous landslides which also increased the load of sediments in the water and further resulted in the rise in water level of the rivers due to aggradation of boulders and sediments. The wooden logs drifting with high velocity water currents, also accumulated in the reservoir areas, reducing the velocity of water. The wooden logs and debris were also seen, as evidence in the eddy areas where river water gets retarded and deposits its sediment (Surya Prakash, 2012).

A number of motor and pedestrian bridges were washed off and damaged by these eventualities. Large number of pilgrims were thus stranded at various places and there was scarcity of essential services. The heavy precipitation also

washed away number of vehicular and pedestrian bridges, including motor bridge at Gangotri on the Rishikesh-Gangotri National Highway. As a result of heavy rainfall, a number of stretches of the Rishikesh – Gangotri National Highway and other connecting roads were also washed away. Connectivity to as many as 85 villages was disrupted and more than 500 persons were stranded at various stretches of the Rishikesh – Gangotri National Highway beyond Uttarkashi. The event also caused widespread devastation in the area. As many as 29 persons, including 3 Fire and Emergency Service personnel, were washed away in the event and 6 persons went missing.

Unusually high and concentrated rainfall in Uttarkashi district during the monsoon season had resulted in cloudburst and flash flood, apart from landslides discussed earlier. Cumulatively these resulted in immense loss of human lives, livestock, personal property and infrastructure (Figure 1). Around 85 villages of the district were affected by these incidences that took toll of 34 human lives. Population of more than 7,000 was directly affected by these incidences. More than 2000 residential houses were damaged, and around 100 farm animals were lost (Table 1).



*Figure 1: Photographs showing the damages of infrastructures along the river  
(Source: The Hindu & Hindustan Times)*

**Table 1: Details of Losses**

Sl.No.	Items	Details
1.	Number of villages affected	85
2.	Population affected	7,389
3.	Permanent loss of land (in lakh ha)	56
4.	House damaged :-	

	(i) Fully damaged pucca houses	131
	(ii) Fully damaged kutcha houses	07
	(iii) Severely damaged pucca houses	127
	(iv) Partly damaged houses (pucca + kutcha)	269
5.	No. of human lives lost	34
6.	No. of missing persons	6
7.	No. of persons with grievous injuries	12
8.	Animal lost	
	(a) No. of big animals lost	68
	(b) No. of small animals lost	338

(Source: *Disaster Relief Memorandum for Central Assistance, Government of Uttarakhand*)

The losses in the event that occurred at Uttarkashi district had aggravated by the topographic features and inherently fragile nature of the terrain. High relief of the area promotes fast and high surface runoff and enhanced pore water pressure together with reduced frictional forces promoting frequent mass wastage in the area. Hence heavy and concentrated rainfall (cloudburst) in the upper reaches of the catchment resulted in flash flood in the downstream areas, which was enhanced by the sudden rise in the water level. In the plains, the heavy rainfall only leads to slow onset floods and water logging, whereas in the hills, mass wastage causes permanent loss of land and infrastructure.

Transport sector was particularly hit hard by landside, flash flood, cloudburst and flood events. Rishikesh – Gangotri National Highway, along with link roads were disrupted and the Government had to arrange supply of essential commodities in the remote areas. The summary of traffic disruption along the Char Dham Yatra route highlights the seriousness of the situation (Table 2). The National Highways of Uttarkashi, Gangotri and Yamunotri were almost closed during July-August.

**Table 2: Details of traffic disruption along Rishikesh – Gangotri as also other National Highways in the state between 1st June and 18th August 2012.**

<b>S No.</b>	<b>Highway</b>	<b>Number of days when traffic was disrupted on the Highway</b>			
		<b>June (30days)</b>	<b>July (31 days)</b>	<b>August (Till 18th )</b>	<b>Total (79 days)</b>
1.	Rishikesh - Gangotri	05	09	15	29

2.	Yamunotri	03	09	16	28
3.	Rishikesh - Badrinath	Nil	08	10	18
4.	Kedarnath	02	07	05	14

(Source: *Disaster Relief Memorandum for Central Assistance, Government of Uttarakhand*)

### Relief and Rescue:

The Government of Uttarakhand mobilized its resources to manage the situation and Army, Para-military forces, Indian Air Force and NDRF assisted the state Government in rescue and relief operation. More than 34 human lives were lost due to the event that has totally devastated the entire region and gains of more than a decade of development were washed off overnight.

The State Government deployed its resources and took precautionary measures to manage the situation. All educational institutions of the district were closed and all the Government officials, who were on leave were recalled for duty. Additional Revenue officials (4 SDMs and 5 Tehsildars) were also deployed in district to assist the local administration. Support was sought from Army, ITBP, NDRF and IAF which assisted in rescue, evacuation and distribution of relief.

The monsoon season also coincides with the peak pilgrim season of the State and people in large numbers from across the nation visit Badrinath, Kedarnath, Yamunotri, Gangotri and Hemkunt Shahib Shrines situated in the Higher Himalayas. These pilgrims and tourists in large number were stranded at various places during monsoon season. The situation was more serious on Rishikesh – Gangotri National Highway, which was continuously blocked for a long period as the vehicular bridge at Gangotri was washed away.

The State Government, however, ensured that the pilgrims and tourists were evacuated at the earliest and IAF helicopters were pressed into action to evacuate the stranded pilgrims as also those requiring medical aid. State Government also ensured the supply of essential commodities and medicines and medical teams were even air dropped at remote locations. The blockade of traffic along the link roads, however, hampered supply of essential commodities to the far flung remote areas and extra effort was made to ensure that the public do not face scarcity of the essential supplies. On many occasions the State Government resorted to manual or animal transportation of essential supplies to ensure that there was no scarcity in remote areas.

Uttarkashi is a multi-hazard prone district, also facing human induced disasters resulting from unplanned development of land, forest cover, river basins, flood plains and especially from manifold population growth and tourism. Thus Uttarkashi, which forms part of the Hindu Kush Himalayan region, has to be prepared to face and cope with such disasters, especially when it is not possible to prevent them. The development of coping capacity needs to be in all the forms and also with short and long term perspectives. There should be a plan to respond in the first phase and then to prevent or mitigate the disaster and to be prepared as a follow up phase. Early return to livelihood should be the goal of all these measures. This will need for mainstreaming the disaster risk reduction (DRR) in developmental plans (Anandha kumar, K.J., 2013).

The predictions of the impact of the climate change through modeling studies indicate increase in intensity of rainfall in some areas, though there may not be much variation in the annual rainfall. Goswami et al. (2006) found that the frequency of occurrence, as well as intensity of heavy and very-heavy rainfall events have significant increasing trends. There is need to prepare for these eventualities and prepare the community, so that community can be a reliable first responder, before the help reaches from outside, especially when communication and approachability gets disturbed, hampering access to the area in the hilly terrain, covered with forest. Further, People centric disaster management will also bring in a sense of ownership which will sustain such initiatives. The community may have to learn to live in total harmony with the nature.

### **Reference:**

1. Anandha kumar, K.J., 2013, Flash Floods in Uttrakhand - Lessons for Disaster Management, Science Reporter, August, 2013, pp. 28-29
2. Disaster Relief Memorandum for Central Assistance, 2012 Department of Disaster Management, Government of Uttrakhand.
3. Goswami, B. N., V. Venugopal, D. Sengupta, M. S. Madhusoodanan, and P. K. Xavier, 2006: Increasing trend of extreme rain events over India in a warming environment, Science. 314, 1442– 1445, doi:10.1126/science.1132027.
4. Satendra (2003) Disaster Management in the Hills, Concept Publication, New Delhi.
5. Shrestha B. Arun and Bajracharya R. Sagar (2013)-Case Studies on Flash Flood Risk Management in the Himalayas- In support of specific flash flood policies, ICIMOD, Kathmandu, Nepal.
6. Surya Prakash, 2012, Flash Floods and Landslides in Uttarkashi district, unpublished report of NIDM.

## 4. HEAVY RAINS & FLASH FLOODS IN HIMACHAL PRADESH

### **Introduction:**

The southwest monsoon season of the year 2012 also brought heavy rains to the Himachal Pradesh and in some places cloud burst leading to flash floods. The write up of this event is based on the Memorandum submitted by the Government of Himachal Pradesh to Government of India.

Although the rainfall during the months of June-July was below than normal, it was above normal in the month of August, in ten districts, from 18th to 26th August and on 30th August. The rainfall records of India Metrological Department (IMD) also confirmed this fact. The excess rainfall varied from 2% to 55%. Similarly during the month of September, eight districts out of 12 excluding Kullu, Lahaul & Spiti, Shimla and Sirmaur recorded higher percentage over normal rainfall ranging from 10 to 76%, particularly on 8th, 12th to 15th and on 17-18th of September, 2012.

### **Impact:**

The very heavy rainfall washed away long stretches of roads, breached culverts, etc. at various location. Flash floods on account of cloud bursts at Kit Nullah area of Lahaul & Spiti, Manali area of Kullu district and Paonta Tehsil of Sirmaur district washed away road and bridges and inflicted considerable loss of life as well as to public/private property was recorded. Normal life was disrupted at many places for an extended periods of time.

As many as 29 human lives were lost due to unprecedeted very heavy rains. Also 127 heads of cattle perished. Detail of losses and damages are given in Table.1.

**Table 1: Extent of damages**

<b>S. No.</b>	<b>Item</b>	<b>Details</b>
1.	Total number of districts in the State	12
2.	Number and names of districts affected	12
3.	Number of Villages affected	17315
4.	Population affected (in lakh)	4525000
5.	Total land area affected (in lakh hac) including horticulture	128354 hect.
6.	Cropped area affected (in lakh hac):	----
	(i) Area where crops damaged was more than 50%	57981 hect.
7.	Houses damaged:-	
	(a) No. of houses damaged:-	
	(i) Fully damaged pucca houses	323
	(ii) Fully damaged Kutcha houses	456
	(iii) Severely damaged Pucca houses	598
	(iv) Severely damaged kutcha houses	536
	(v) Partially damaged houses(Pucca+kutcha)	498
	(vi) No. of huts damaged	767
9.	No. of human lives lost	29
10.	Animals lost:-	
	(a) No. of big animals lost	45
	(b) No. of small animals lost	2
11.	Damages to Public properties:-	
	(a) In physical terms (sector-wise details should be given-e.g. length of State roads damaged, length of village roads damaged, No. of bridges damaged, No. of culverts damaged, No. of School buildings damaged etc.)	Detail enclosed on enclosed appendix
	(b) Estimated value of the damage to public properties	625.96
14.	Estimated total damage to houses, crops and public properties	961.32 crore

*(Source: Memorandum of Damages due to Excessive Rain, Flash Floods etc., Government of Himachal Pradesh, 2012)*

Due to heavy rains, flash floods and cloud bursts etc. damage was also caused to the public buildings such as Patwakhanas, Kanungo huts, Panchayat Ghars, Primary health Centers etc. maintained by the Deputy Commissioners.

### ***Agriculture loss***

Economic condition of the farming community as a result of this calamity has become precarious. As much as 88,693 hectare of agricultural cropped area was affected. Out of this, in 39,107 hectare area, the crop loss was more than 50%.

### ***Horticulture loss***

The fruits that were ready to harvest could not be harvested and transported to the markets as the roads & bridges were damaged. The delay in harvesting of the fruit coupled with high humidity resulted in infection of sooty blotch and fly speck diseases, which affected the quality of fruit (less color development and black spots on the fruit). Heavy rains followed by large scale landslides and flash floods in fruit orchards, washed away fruit trees. About 11,17,503 nursery plants and 65, 683 number of fruit trees were damaged due to heavy rains/flashfloods etc. There were losses to horticulture infrastructure like poly houses also.

### ***Loss to infrastructure***

Loss of the infrastructures such as, roads, bridges, and buildings etc. which are being maintained by the Department of Public Works was also quite enormous. The roads in Himachal Pradesh are mostly kutcha and most of the length lacks cross- drainage. The topography and fragile nature of the mountains with steep gradients make cross drainage works difficult. Due to the intensive rain in a short span of time, the surface was washed away in the higher hills causing pot holes. Immense damage was caused to the retaining walls, breast- walls, roads side drains etc. A large number of bridges and culverts were damaged. Since, the roads are the lifeline for the economy of the State, the suspension of the traffic on many roads in the interior, remote areas, led to slow down in economic activities. However, due to efforts of concerned authorities the roads could be reopened to the traffic soon but land slips continued to occur in the wet months resulting in interruption in transportation and communication. A total of 17287 Kms roads, 5 bridges and 784 culverts were badly damaged due to these rains. A section of damaged road is shown in figure 1.



*Figure1 : Damaged roads in Himachal Pradesh  
(Source: Times of India)*

### ***Loss to Irrigation***

The impact of the heavy rain to the water supply scheme, irrigation schemes and the flood control schemes were also very damaging :-

- (a) Water supply schemes were damaged as the pipelines were washed away. Number of pump houses developed cracks. Intake structures and due to filling of sand the sources of many water supply schemes were also damaged.
- (b) Irrigation schemes were also extensively damaged due to cracks, slips, and landslides. Field channels were damaged due to slippage of patta on the valley side.

Further as a result of excessive rains during the later half of the monsoon season, the buildings of livestock farms and sheep breeding farms were also damaged.

### ***Loss in Urban Sector***

The urban area also suffered damages due to heavy rains during the later quarter of the rainy season and extensive damage were caused to roads, drinking water and irrigation schemes as well as to properties (Figure 2). There was heavy loss to the Municipality of Shimla/Municipal Councils and Nagar Panchayats due to heavy rain.



Figure 2: Damages in Simaur, H.P  
(Source: IBN Live)

### **Loss to Power Assets**

Power supply infrastructure, including generation, transmission and distribution systems were damaged. Many stretches of HT/LT lines as well as distribution transformers were damaged or were washed away due to copious flow of water and flash floods.

### **Relief and Rescue:**

The roads were restored and the damaged bridges and culverts were reconstructed to reopen for traffic and to restore communication. However being a hilly terrain, the extra efforts were required to bring back normalcy. Police evacuated hundreds of families residing near the river banks between Palchan and Kullu to safer places. The relief work was carried out on a war-footing and people were moved to safer places (Times of India.5th August, 2012).

Most of the points discussed in the lessons learnt in the chapter on Heavy Rains in Uttarkashi are valid for Himachal Pradesh also as the terrain is similar.

Further the economy of the state depends to a large extent on the horticulture, especially fruit cultivation. The timely transportation of the harvest to the market needs to be prioritized. The maintenance of roads in good condition, throughout the year is needed for the prosperity of the people. Further restoration of communication is important for revival of the livelihood of the community in

the hilly areas. To stabilizing road slippage and landslide it important use bio-engineering techniques. Maintenance of drainage hills also help in minimizing damage to roads. The Government may have to work with the community to plan for the Disaster Management at very grass root level as the villages are scattered in the hilly regions. These steps will go a long way in sustainable development of the area, increasing the coping capacity of the people.

**Reference :**

1. Memorandum on Damages due to Excessive rain, flash floods etc during South West Monsoon, 2012, Revenue Department, Government of Himachal Pradesh.

## 5. ASSAM BOAT TRAGEDY

**Dhubri**, the “Gateway of Assam” situated at the western most corner of the state and the district happened to be in the past a meeting place of different racial groups which mingled together to form a unique cultural heritage and historical background. This district is located between longitude 89°.42' to 90°.12' E and latitude 26°.22' to 25°.28' N. The district is situated 30 meters above the sea level on average. It has become the most densely populated district in India with a density of 584 persons per Sq.km (2001 census). Dhubri is also one of the most flood prone districts of Assam.



Figure 1: Site of Dhubri

The mighty river Brahmaputra flows through Dhubri district initially in East – West direction and then North- South direction dividing the district into two unequal parts. In the Northern part, Dhubri Town is situated (Figure 1), which is the hub of all business and commercial activity (Figure 2). It is also the headquarter of

the district with Judicial Courts including that of Sessions Court. Apart from the Sadar Sub- Division, there is one more outlying Sub-Division viz. Bilasipara Civil Sub- Division in the Northern part of the mighty Brahmaputra. Dhubri Town is well connected by road as well as rail with the State Capital and rest of the country. There is well equipped Civil Hospital in the Dhubri Headquarter. In the southern part of the district, there is another outlying Sub- Division viz. South Salmara Mankachar Sub- Division with its Headquarter at Hatsingimari. There are two revenue Circles and five Development Blocks in the Southern Part of the district. There is no Judicial Courts and Treasury Office at South Salmara Mankachar Civil Sub-Division. There is no bridge over the mighty river Brahmaputra to connect the southern part and *chars* (river islands) in the river with the district headquarters at Dhubri town. Due to continuous siltation and erosion of the river banks, many chars have grown up amidst the river. Apparently, due to heavy bank erosion in the southern bank of the river, the middle river course has become shallow widening the breadth of the river and forming abounds of sandbars in many places. As a result of which in some places breadth of the river has increased by fifteen to twenty kilometers. Due to siltation and formation of *Chars*, the river course does not remain a single but divergent of many streams and channels flowing towards the Bay of Bengal. However, most of the stream dries up during the winter season. As a result, crossing of this mighty river becomes time-consuming and tedious during the Winter Season i.e.



Figure 2: Location of Dhubri and Medartary Ghat across mighty river Brahmaputra, Assam  
(Source: Google Earth)

from November to May. It takes 3-4 hours to cross the river towards upstream journey and one and half hours to two hours to downstream journey. Moreover from the month of February, cyclonic storms with high velocity winds as well as fog makes the navigation very difficult and detrimental too. There are reports of incidents caused by collision and stuck up boats in the char/sandbars in the winter season due to poor visibility and dense fog.

Despite such troubles, people are bound to travel to Dhubri Town for their livelihood (i.e. to sell their local products like milk, fish, vegetables etc.), to get their official works done in offices and courts and to run their business as well. They are also forced to frequent visit for higher education and better medical facilities. As Dhubri is the only connectivity to State Capital and other places outside the State, they have to take the river route with all sorts of difficulties of navigation as the only alternate source of transportation. About 5,53,885 people of south Salmara Mankachar Sub Division, people from Meghalaya and Western Goalpara also use these boats plying in the great river to and fro from Dhubri Town, operated by various individuals, private parties, syndicates etc. Every day, these boats basically ply from various Ghats of Dhubri from morning to evening.

### **Overview:**

The write up about the event is based on the field visit report of **Professor Chandan Ghosh** of NIDM and other secondary information collected from different source. On the particular day of incidence, the weather was clear at the time of departure. But after sailing of the boat for about one and half hours heading towards Mederatari, at about 4:30 pm, when the vessel was reaching near Naramari Char, a terrible cyclonic storm struck the ferry. As per the statements of passenger survived, big waves (reported to be measuring 15 to 20 feet high) deliberately stroke the Vessel and twisted it from one side to other. Passengers, mostly women were screaming desperately and praying God to save their lives. People inside the boat were rolled like objects, as the boat went on twisting. The passengers held on to the posts and other supports to remain inside the vessel. It was also learnt that passengers earnestly requested the crew to stop the vessel and anchor at nearby Naramari Char. But the crew did not listen to the requests of the passengers instead increased the speed to reach the shore as soon as possible, resulting in disaster. The Vessel went twisting along as stated and rising upward and downward with the high waves

losing its control. The Vessel however reached the shore at Medertari and hit the shore with big smash. Some of the passengers jumped from the boat and saved their lives crawling. Meantime, the boat was gushed away from shore by velocity of the wind caused by storm towards the mid-stream about 100 mtrs. Again it was pushed back to shore by the rising waves and wind and rear side of the boat attached to cabin touched the land (Figure 3 & 4).

Some of the passengers escaped at that moment who were inside the cabin and on the “Choi” (top shed) by jumping and crawling ashore. Passengers, mostly women and children including infants could not exit from the sitting ward of the boat and remained inside. However some of the passengers escaped through windows and a narrow stair. Unfortunately, the boat was pushed back to the midstream again by the velocity of wind and storm. The pressure of the devastating storm was



Figure 3: People pulling out the ill-fated ferry  
(Source: From Web)



Figure 4: Accident site on 1st May 2012 - remains of 21m long boat carrying estimated 250 passengers with luggage, livestock and two wheelers, Medartary Ghat, Assam, about 12 km South of Dhubri town  
(Source: From Web)

such that the “Choi” as well as the hull portion was dismantled and the bottom of the boat got split and the entire portion sank into 3 to 3.5 M deep water. However, it was learnt that even at the time of sinking, few people escaped swimming to shore. People who were left behind remained on board and died drowning. The passengers who escaped to the bank tried rescuing, drowned people either dead or alive. Their efforts saved many and helped to trace the dead bodies and fish them out from the depth of the river (Figure 5 & 6). Several dead bodies were recovered during night hours of the day of incident, i.e. 30.04.2012.



*Figure 5: People being rescued  
(Source: From Web)*



*Figure 6: Search and Rescue operations. People being rescued (Source: From Web)*

### **Impact :**

As per report of local Administration the impact of the boat tragedy was as follows:

- 163 persons approximately swam ashore or were rescued by the community
- 41 dead bodies found & post-mortem and inquest conducted
- 35 persons injured
- 8 persons missing

### **Response :**

The Indian Army, Navy, Border Security Force, National Disaster Response Force (NDRF) and police armed with mechanized boats launched a massive search and rescue operation in the river, which continued till night. Moreover, bad weather and strong current did not allow to search for survivors. Deep sea divers and disaster rescue soldiers worked throughout the night to help survivors



Figure 7: Dead Body being retrieved from the river  
by Search and Rescue personnel  
(Source: Associated Press)

to shore and retrieve bodies from the river (Figure 7). Soldiers and members of NDRF team hauled the remains of the ferry from the river with the help of tractors.

NDRF teams, each including 40 personnel were deployed in each of the affected districts of Dhubri, Dhemaji, Jorhat, Lakhimpur and Sonitpur. Deep-sea divers and disaster rescue soldiers worked through the night to pull bodies from the Brahmaputra River. Rescue operations were centered on the tiny



Figure 8: People standing on the shore watching the Search and Rescue Operations  
(Source: Associated Press)

village of Buraburi near the India-Bangladesh border. Heavy winds and rain hampered rescue operation. Hundreds of people congregated on the banks of the Brahmaputra for information about their family members missing in the ferry capsized, as rescuers braving torrential rain searched the river for survivors (Figure 8).

The Border Security Force (BSF) Water Wing, State Police Force, Army, etc. also arrived at the spot on call and took part in the rescue operation with local people and survivors at Mederatari. The Telephone number 0361-2842972 at BSF frontier Headquarter Guwahati was made the helpline. This Telephone number was made operational 24 hours for public who wanted to seek information.

### ***Measures Undertaken by the Government of Assam***

There were some immediate measures taken by the administration after the boat tragedy. All the deputy commissioners were asked to undertake checks carried out on the operation of the vessels to ensure that they do not carry passengers exceeding their carrying capacity. Inland Water Transport (IWT) was asked to ensure that there were adequate life jackets and life buoys in the boats and vessels .The carrying capacities of the ferries were to be displayed prominently for information of the passengers. The local administration was asked to check all vessels for its fitness to ply in water. The deputy commissioners were also instructed to carry out regular checks for next 30 days for ensuring 100% compliance of the vessels to safety norms and send the progress report to State Disaster Response and Information Centre every day.

In the aftermath of the Dhubri ferry tragedy; there was an increasing demand to improve the state's disaster management units as the tragedy showed that the units are not prepared to handle calamities in the state. The Assam State Disaster Management Authority (ASDMA) directed Inland Water Transport Department to conduct safety audits for all the ferries that ply in different parts of the state. To avoid any mishap, the Department was also requested to ensure that the ferries did not exceed the goods and passengers' carrying capacity. Strict orders needed to be enforced to halt the excess loading in all modes of transportation. The ferry tragedy also highlighted that advanced weather warning system was a necessity. Thus, ASDMA in collaboration with the North Eastern Council has decided to install advanced weather warning system in high-density river transportation areas across the State.

Some of the other mid term as well as long term measure which were undertaken to avert future disasters such as the boat tragedy include:

- The Indian Meteorological Department (IMD), Guwahati to ensure that the Regional Monitoring Centre (RMC) Guwahati was in a position to issue bulletins of near time forecasting (Nowcasting) of weather conditions over the river Brahmaputra as needed by Inland Water Transport (IWT).
- IWT boats to be deployed at each of these Ghats for running the Ferry Services as models to be emulated by the lessees who will continue to run their services alongside the IWT Ferries. IWT Ferries would have experienced/trained crew and will be in good mechanical condition with adequate safety equipments (Life buoys and Life-Jackets etc) as per the Act/Rules.
- Competent IWT Officials to be nominated as Ferry Ghat Managers at each Ghat. They are to be equipped with mobile phone.
- Proper communication-protocol to be organized and constant liaison would be maintained by IWT/Deputy Commissioners (DC) Control Room with IMD on one hand and Ferry Ghat managers on the other so that there is no breakdown in constant flow of 3 hourly weather bulletins to the Ghats.
- The system of coded messages which give all information about locations, freight, passengers etc. have already been evolved by the IWT. This would be a valuable tool in proper monitoring of all riverine movements across these Ghats. Log books would be maintained at the ferry Ghats for this purpose.
- Prominent sign boards be put up at the Ferry Ghats where weather information should be updated every 3 hours, especially before departure of Ferry Service.
- A 3-part danger signal arrangement with Green, Yellow and Red Flags to be put up at each Ghat to display the prevailing weather conditions and explained in the Signboard (Green Flag would indicate normal good weather; Yellow: Moderately turbulent weather when due care and caution is to be observed and Red: dangerous weather conditions where no boat should ply till the weather improves and Red Flag is replaced by Yellow or Green).

- Mass Public Awareness Programme to be undertaken through various means (Radio, Television, Press Release and distribution of Leaflets to Ferry passengers along with the tickets.)
- Special training Program to be organized for the Crews.
- Departmental Ferry Service to be a model for the lessees to emulate in these Ghats and others. Operation of ferry service by more than one Service Provider would encourage competition for providing better services and safety to passengers and give choice to the passengers to choose the better operator.
- A proper regulatory regime of periodical surprise inspection of vessels and equipments (especially of the safety equipments like Life-Buoys/Jackets etc) to be brought into force and strictly implemented. List of safety equipments to be displayed prominently on each boat for the passengers to view.
- Standard Operating Procedures (SOPs) was to be prepared for normal operation and for meeting emergencies and other contingencies.
- Quick Response Teams to be organized by the River Police at each Ghat.
- Regular inspections of the Ghats and observance of the mandatory and cautionary arrangements shall be conducted by the Directorate of IWT. Representative of ASDMA would also be associated with this exercise.
- In case of Assam, the Inland Water Transport (IWT) of Assam should carry out a comprehensive review of the Safety Management System (SMS) to determine which areas are functioning effectively and which areas need improvement. These measures will go a long way in maintaining safety of passengers.

In Assam, where inland water transport through Brahmaputra and its tributaries is a lifeline for thousands, over aged boats still ply overcrowded not only with people, but also with vehicles and animals. It was found that the ill fated ferry that capsized on 30 April, 2012 was carrying nearly 300 people and was operated without a proper permit since 1994. There is a need for proper checking of permits and renewing them regularly. At many places in the country, boats still run without life jackets or tubes, engines are not checked for fitness, and there

is blatant violation of rules on the river highways. Such boats do not have any safety measures, but daily passengers have no other means.

### **References:**

1. Chandan Ghosh (2012), Report on Boat Capsize Incident Near Medartari Ghat of Dhubri District, Assam, National Institute of Disaster Management, New Delhi.
2. DM Plan of Dhubri District, Assam.
3. "The cyclone struck suddenly and the ferry was hurled in the air". The Hindu. 1 May 2012. Retrieved 2 May 2012
4. "Assam boat tragedy: 103 killed, over 100 missing". The Times of India. 1 May 2012. Retrieved 2 May 2012.

## 6. RAILWAY FIRE ACCIDENT - TAMIL NADU EXPRESS

Indian Railways is one of the largest networks of the world under a single administration i.e. Government of India. Indian Railways has 64,460 kilometers (Km) route, out of which 55,189 Km is broad gauge and balance 14% is metre/narrow gauge. It has 7,133 block stations, 53,220 passenger coaches and 92,13 locomotives. Indian Railways carry about 1,000 million tonnes of freight traffic per year and around 23 million passengers per day. Indian Railway employ around 13 million staff in the 17 zonal railways and 69 divisions. The Railways play a significant role in driving economic growth of the country, offering highly affordable, environment-friendly transportation to passengers and freight, especially bulk commodities, across the country.

Being one of the largest networks, it is fraught with accidents. The data of the accident scenario of the Indian railways, from year 2003-2004 to 2011-12 (Figure 1) is depicted below.

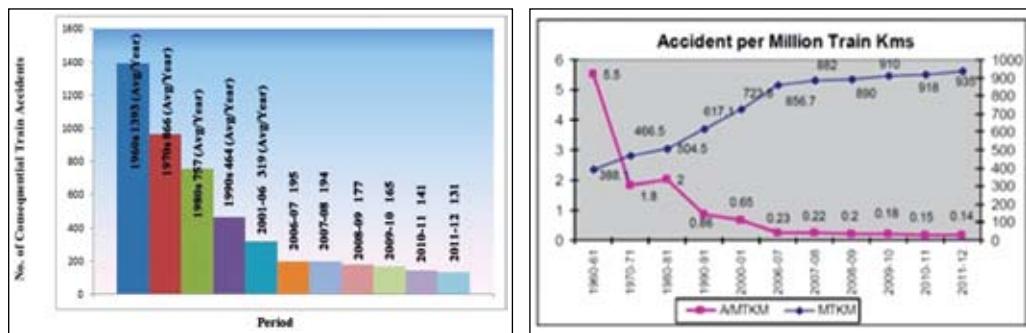


Figure 1: Total accidents over Indian Railways. (Source: Ministry of Railways)

### Overview :

An unfortunate incident of fire in Tamil Nadu Express bearing the train Number 12622, which was to travelling from New Delhi to Chennai, took place at Nellore station of Vijayawada Division of South Central Railway at about 04.28 hrs. on

30.07.2012. While the train was passing through Nellore station, fire broke out in Sleeper Class Coach No. S-11 (positioned 20th from train engine and 5th from the rear). Gateman of Level Crossing Gate No. 116 noticed fire. Deputy Station Superintendent of Nellore Station attempted to stop the train and the train could stop only after passing Old South Cabin of Nellore.

The cause of the incident was being investigated from all possible angles, in cooperation with the State Government authorities of Andhra Pradesh. Forensic experts also visited the accident site to collect evidence. Statutory inquiry into this incident was ordered to be conducted by Commissioner of Railway Safety (CRS), South Central Circle, under the Ministry Civil Aviation. The inquiry revealed that the cause of the railway accident was a fire breakout in the unfortunate coach which was due to bursting of a cracker.

Every accident in unfortunate and every single death in train accident is a cause of concern and needs to be looked from a preventive angle to provide safe and secure journey to rail users. The causes of train accidents for the decade 2002-2012 are highlighted in Table 1.

**Table 1: Causes of Consequential Train Accidents**

Causes of accidents	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2011 (April-July)	2012 (April-July)
Failure of Railway Staff	186	161	119	120	85	87	76	63	56	58	14	14
Failure of other than Railway staff	36	21	13	21	12	16	13	10	9	7	3	3
Failure of equipment	18	18	14	8	9	9	-	6	5	3	2	1
Sabotage	10	18	4	6	8	7	13	14	16	6	1	3
Combination of factors	2	2	1	-	1	0	4	1	3	1	-	-
Incidental	15	17	16	11	7	8	5	4	4	2		3
Could not be established conclusively	2	2	2	3	1	2	4	2	-	-	-	-
Under Investigation											-	-
Grand Total	269	239	169	169	123	129	115	100	93	77	20	24

(Source: Ministry of Railways)

## Impact :

During the present accident, the affected coach (S-11) got completely burnt. As per information received from the Ministry of Railways, 28 passengers lost their lives in this unfortunate incident and 25 passengers with burn injuries were admitted to different Government and private hospitals of Nellore. Out of these 7 passengers have suffered grievous injuries and 18 passengers have suffered simple injuries.

## Response :

Medical relief was immediately dispatched through Accident Relief Medical Train (ARMV) from Bitragunta Station. ARMV, Bitragunta left at 05.18 hrs. along with team of doctors and reached accident site at 06.20 hrs. Accident Relief Train/ Bitragunta Station was also ordered at 4.29 hrs., left at 05.20 hrs. and arrived Nellore at 06.22 hrs. Fire Brigade was arranged immediately from Nellore and it reached the site at 04.50 hrs. Fire was extinguished at 05.00 hours. Front portion of the train (Train Engine and 19 coaches) left the accident site at 06.36 hours. for its onward journey and reached Vedayapalem at 06.55 hrs. Rear portion with five coaches including affected coach was backed on Line No.3 of Nellore Station at 07.30 hours. Divisional Railway Manager, Vijaywada rushed to the site by a special train at 06.25 hrs. along with a team of officers and doctors to supervise the relief and rescue operations. Chairman, Railway Board and Member Electrical rushed to the accident site by first available flight. General Manager, South Central Railway along with Departmental Heads also left for site by a special train. The Minister of Railways visited the site and met the injured passengers in hospitals. Arrangement was also made to run a special train to carry relatives of affected passengers from Chennai to Nellore.

The General Managers of all Zonal Railways were instructed to exercise extra vigil as well as to launch a special safety drive regarding precautions to be taken to avoid recurrence of such accidents. An enhanced ex-gratia of Rupees five lakhs to the next of the kin of each deceased, rupees one lakh for each grievously injured and Rs.25, 000/- for each simple injured passengers was announced. A multi-disciplinary team consisting of high ranking officers was deputed to inspect and examine the coaches of the affected rake of 12622 Tamilnadu Exp. to ascertain the clues behind the fire incident. The team examined the rake of Tamilnadu Exp. at Basin Bridge Coaching Depot, Chennai on 30.7.2012

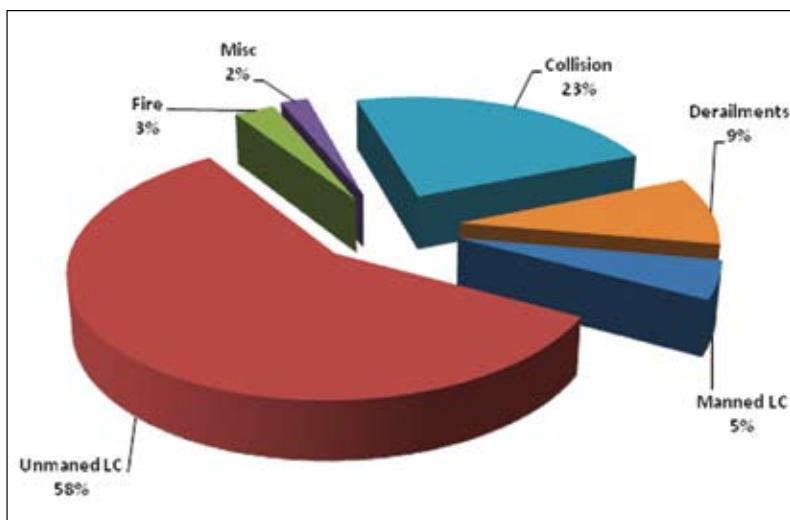
and 31.7.2012. The rake was visually examined from electrical safety point of view. All the rotary switch boxes, electric supply arrangements, AC Panels were checked. Tests, namely, Earth Testing, Meggaring, specific gravity of battery cell were carried out. The wiring of few coaches was checked by removing the side panel of coaches and examined. Samples of material used in coaches, including cable and switches was taken from few coaches and the sealed sample were sent for testing of fire retardancy and toxicity in a laboratory of national repute. The electrical coach maintenance practices of Chennai Division were examined and discussed with the officers of Chennai Division.

Indian Railways undertook various measures to prevent incidents of fire in trains, which include the following:

- I. Ministry of Railways constituted 2 separate Fire Safety Audit Teams vide Order dated 24.7.2012 to plan safety audit in selective stations, coaching depots and workshops, etc. The mandate of these teams included-
  - ❖ Visit to National/Regional test centres of repute to familiarize with fire safety measures, testing procedures, toxicity characters in coach furnishing materials, electrical cable and equipment, fire retardant properties, automatic fire detection systems, fire extinguishing systems and latest standards adopted by European Railways.
  - ❖ Scope of up gradation to match latest fire safety norms of international standards
  - ❖ System of providing, refilling and use of fire extinguishers
  - ❖ Security checks of passenger luggage and unauthorized smoking, carrying of inflammable and fire prone materials in trains
  - ❖ Fire safety measures in pantry cars, power cars and vehicles having DG sets
  - ❖ Loading of inflammable materials in brake van/parcel van, etc.
- II. In order to enhance fire worthiness of coaches by using more fire retardant furnishing material. Specifications for such furnishing materials have been periodically upgraded to incorporate fire retardant parameters in line with national and international norms. All new manufacture of coaches/ periodical overhauling of existing coaches is being carried out with fire retardant specifications of the furnishing materials.

- III. With a view to improve fire safety in running trains, a pilot project for provision of Comprehensive Fire and Smoke Detection System was taken up in one rake of Rajdhani Express on Northern Railway. Field Trains on this rake were found to be working satisfactorily. It was decided to provide similar automatic fire alarm system in 20 more rake for extended field trials. The system would provide advance warning in case of any fire hazard in running train and thus enable the passengers to protect them from fire.
- IV. Guard-cum-Brake Van and AC Coaches in all trains were provided with portable fire extinguishers to cater for emergencies due to fire accidents.
- V. Improved materials for electrical fittings and fixtures such as MCB, light fittings, terminal boards, connectors etc. were being used progressively.
- VI. Detailed instructions have been issued to zonal railways for observance of safe practices in handling of pantry cars and for ensuring periodical inspection of electrical and LPG fittings in the pantry cars.
- VII. Intensive publicity campaigns to prevent the travelling public from carrying inflammable goods were regularly undertaken.

Safety is accorded the highest priority by Indian Railways and all possible steps are undertaken on a continual basis to prevent accidents and to enhance safety. Various safety measures, both long term and short term, have been taken in the recent past to further improve the safety environment over Indian Railways. However, along with the initiatives of railways, public support and cooperation is also required to ensure safe travel for commuters. The commuters need to refrain from practices which might contribute to the vulnerability of other passengers. For example, the rail accident in Tamil Nadu express was attributed to fire breakout caused by a cracker. This was eventually due to negligence of the commuters. Amidst discussions with railway officials, the problem of accidents at unmanned level crossing was highlighted. As on 01.04.2012, there were a total of 31,846 level crossings spanning over 64,460 route kilometers i.e. average of 49 level crossings per 100 kilometers in Indian Railways. Out of which 13,530 were unmanned and 18,316 were manned. Out of 18,316 manned level crossing 9,978 (54%) are interlocked i.e. protected by a Gate Signal as an additional layer of safety. Analysis of 5 year data of consequential train accidents for the period from 2007-08 to 2011-12 (Figure 2) reveals that a large chunk of 779 deaths (58%) (Figure 2) and 670 injuries (27.5%) were due to unmanned level



*Figure 2: Loss of life in Train accidents (2007-08 to 2011-12).  
(Source: Ministry of Railways)*

crossing accidents attributed to the negligence of road users and it constituted 36.4% of the total train accidents. Manned level crossings accidents which are about 5 % (Figure 2) of total tally resulted in 4.8% deaths and 5.5% injuries.

Accidents at level crossings happen primarily because the road users do not respect the right of way of railways. The primary causes of accidents are failure of road users e.g. mis-adventure to cross level crossings in the face of an approaching train, road vehicles getting stalled at the locations, rash driving of un-licensed tractor drivers etc. It was also observed that the road vehicle drivers misjudge the speed of trains due to the fact that human reaction time is 2.5 seconds, which is just enough to coordinate the reflexes against speed of 60-70 kmph. However, trains on Indian railways generally ply at a speed of about 100-120 kmph for which the reaction time is inadequate. Road users continue to cross the tracks even if the train is visible and approaching causing leading to level crossing accidents. The problems of mobility and accident prevention at level crossings can best be addressed by joint efforts of all concerned - Central Government, State Government, Municipalities, NGOs, educational institutions and private operators and primarily the public. Hence, in order to prevent loss of lives due to unmanned level crossings, a greater level of public awareness, participation and cooperation is needed. We need to adopt a culture of safety to prevent ourselves from putting our lives at risk.

## 7. HEAVY RAINS & FLOODS IN ANDHRA PRADESH (NILAM CYCLONE)

### Introduction

Cyclones are common in the eastern coastal region of the country. India faces the fury of cyclone every year either during the months of May-June or October-November. This year the cyclone "Nilam" hit the eastern coast. Nilam cyclone had a land fall near Mahabalipuram, near Chennai in Tamil Nadu on 31st October, 2012. It was located by IMD and forecast were made well in advance regarding its land fall (Figure1). The cyclone had a less impact during its land fall from 2nd November onwards. The IMD bulletins indicated that the forecast was made for depression (and not for Cyclone) with a forecast for isolated heavy rain, though on 6th November, 2012, the IMD bulletin mentioned about cyclonic circulation. The depression which resulted from the Nilam Cyclone, has affected 19 districts of the state of Andhra Pradesh, when it moved to the adjacent states. In this cyclonic event, about 380 mandals, 8,707 villages and 20.42 lakhs people were affected, which led to complete disruption of normal life in the State of Andhra Pradesh.

Andhra Pradesh is one of the most vulnerable states in India to multiple natural disasters like cyclones, heavy rains and floods, including drought in view of its widespread and peculiar geographical location. The State has a vast coast line of about 1,030 Kms, which is the second largest in the country, next to the western coastal State of Gujarat. Andhra Pradesh has the longest coast line on the Eastern coast of India. The total coastal area is spread over 92,906 Sq. Kms in the nine Coastal districts.

### 'NILAM' CYCLONE:

The path of the Cyclone Nilam in the initial stages is illustrated in the Figure 1 as per the IMD. The Cyclone "Nilam" brought heavy rains resulting in floods during the period from 29.10.2012 to 06.11.2012 and affected 19 districts of the state, as mentioned below.

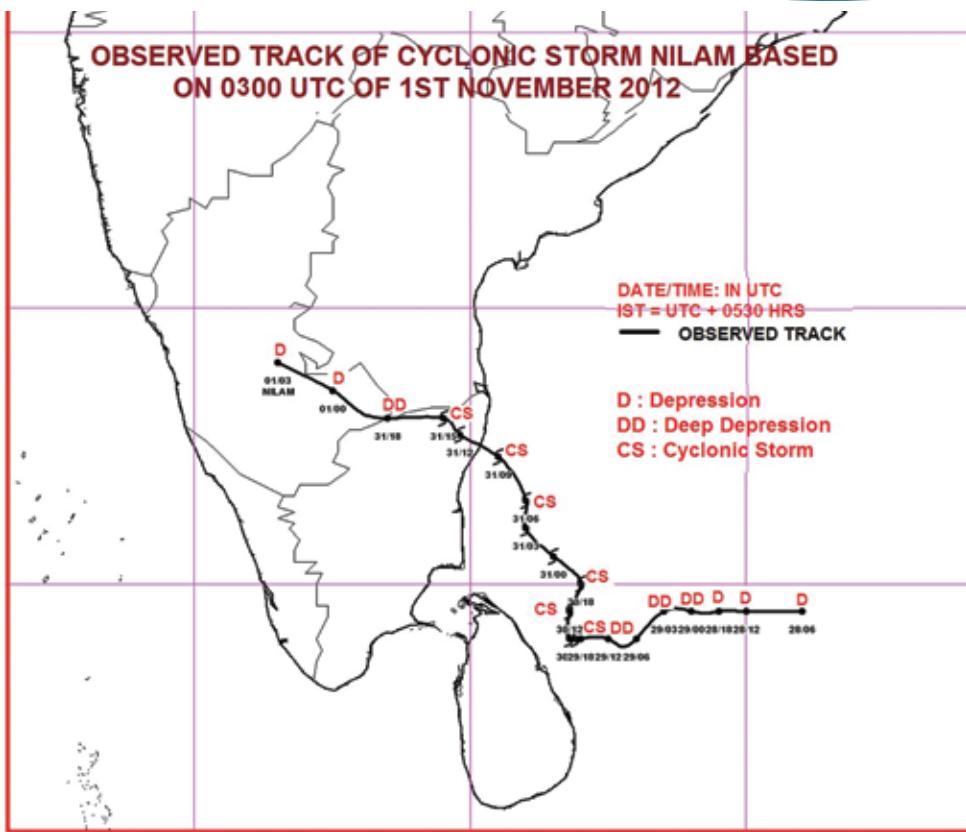


Figure 1: Observed track of Cyclone Storm Nilam till 1st November, 2012  
(Source: IMD web site-[www.imd.gov.in](http://www.imd.gov.in))

Rainfall in Andhra Pradesh is normally influenced by both South-West and North-East Monsoons. Of the normal annual rainfall of 940 mm, 624 mm (66%) is contributed by South-West Monsoon (June-September), followed by 224 mm (24%) during the North-East Monsoon (October to December) and the balance 92mm (10%) of the rainfall occurs during the winter and summer months. The Nilam cyclone brought heavy rainfall during the period from 29-10-2012 to 06-11-2012. Table-1 illustrates district-wise rainfall (mm) for the period i.e. 29-10-2012 to 06-11-2012. The average normal rainfall is 41.4 mm each from 2009 to 2010 for this corresponding period, but the actual rainfall during the aforesaid period was 157.1 mm, which is more than 3 times of normal rainfall. However, district wise analysis of the actual and normal rainfall for the aforesaid period, including percentage of deviation shows that in East Godavari District, the normal

rainfall was 51.0 mm, and in contrast, the actual rainfall was 356.4 mm, with a deviation of 599%, followed by Khammam district with normal rainfall of 21.1 mm and actual rainfall of 202.5 mm with a deviation of 1574%, West Godavari with normal rainfall of 31.1 mm and actual rainfall of 288.5 mm with a deviation of 828%, Visakhapatnam with normal rainfall of 47.6 mm and actual rainfall of 332.3 mm with a deviation of 598%, Krishna with normal rainfall of 41.0 mm and actual rainfall of 261.1 mm with a deviation of 537%, Vizianagaram with normal rainfall of 42.3 mm and actual rainfall of 268.0 mm with a deviation of 534%, Srikakulam with normal rainfall of 58.5 mm and actual rainfall of 256.2 mm with a deviation of 338%, Guntur with normal rainfall of 45.9 mm and actual rainfall of 185.7 mm with a deviation of 305% and so on.

**Table – 1: District-Wise Average, Normal and Actual Rainfall during the Period (in mm)**

<b>Sl. No.</b>	<b>District</b>	<b>Calamity period From 29-10-2012 to 06-11-2012</b>		
		<b>Actual</b>	<b>Normal</b>	<b>% Dev</b>
1	East Godavari	356.4	51.0	599
2	Visakhapatnam	332.3	47.6	598
3	West Godavari	288.5	31.1	828
4	Vizianagaram	268.0	42.3	534
5	Krishna	261.1	41.0	537
6	Srikakulam	256.2	58.5	338
7	Khammam	202.5	12.1	1574
8	Guntur	185.7	45.9	305
9	Prakasam	179.4	68.7	161
10	Nellore	139.5	155.8	-10
11	Chittoor	112.9	73.2	54
12	Kadapa	63.8	47.4	35
13	Nalgonda	62.3	22.8	173
14	Anantapur	60.2	22.2	171

15	Warangal	59.9	16.7	259
16	Medak	47.2	13.1	260
17	Kurnool	40.6	12.3	230
18	Mahabubnagar	34.8	13.6	156
19	Karimnagar	34.1	11.0	210
<b>State Average</b>		<b>157.1</b>	<b>41.4</b>	<b>279.7</b>

(Source: Memorandum on “Nilam’ Cyclone/Heavy rains, Government of Andhra Pradesh)

### **Impact :**

This unprecedented rainfall during the above period resulted in large damage to agricultural and horticultural Crops, milch and draught animals and poultry birds, in addition to extensive loss to the infrastructure of the fisherman. The rain also caused extensive damages to public and private properties including roads, bridges and buildings.

This resulted in death of 61 human lives. Public Infrastructure suffered huge losses as per the Memorandum submitted by the Government of Andhra Pradesh (Table-2).

**Table-2 Details of damages due to Natural Calamities**

S. No.	Item	Details
1	Number and Names of the District Affected	19 - Srikakulam, Vizianagaram, Visakhapatnam, East Godavari, West Godavari, Krishna, Guntur, Prakasam, SPS Nellore, Chittoor, YSR Kadpa, Anantapur, Kurnool, Mahabubnagar, Medak, Karimanagar, Warangal, Khammam & Nalgonda Districts
2	Number of Villages	8707
3	Population Affected (in lakh)	20.42
4	Total Land Area Affected (in lakh ha)	
5	Cropped Area Affected (in lakh ha)	8.91

	(i) Total Cropped Area Affected (in lakh ha) (Agri+Hort)	8.91
	(ii) Area where Cropped Damages was more than 50% (in lakh ha)	5.23
6	<b>House Damaged:-</b>	
	(a) No. of Houses Damaged	
	(i) Fully Damaged Pucca Houses	49
	(ii) Fully Damaged Kutcha Houses	688
	(iii) Severely Damaged Pucca Houses	524
	(iv) Severely Damaged Kutcha Houses	3434
	(v) Partly Damaged Houses (Pucca + Kutcha)	17681
	(vi) No. of Huts Damaged	7311
	(vii) No. of cattle sheds attached to houses	1286
7	No. of Human Lives Lost	61
8	<b>Animal Lost :-</b>	
	(a) No. of Big Animals Lost	505
	(b) No. of Small Animals Lost	1353
	(c) No. of Poultry Birds	98757
9	<b>Damage to Public Properties :-</b>	
	(A) In Physical Terms (Sectors wise details should be given - e.g. length of State roads damaged, No. of Bridges damaged, No. of culverts damaged, No. of School buildings damaged etc.)	
	<b>(a) Roads &amp; Buildings</b>	
	No. of KMs of road surface damaged (length in KM)	6108.63
	No. of Breaches, Potholes etc.	72

	No. of Scoured	17
	No. of Cross Drainage Works	443
	No. of Trees removal of traffic interruption clearing debris and diversion of overflows etc.	123
	<b>(b) Panchayat Raj roads</b>	
	No. of Road Works Damaged (KMs)	9987.14
	No. of CD works	1128
	No. of Building Damaged	937
	<b>(c) Urban water Supply &amp; Infrastructure</b>	
	Roads (in KMs)	673.71
	Water Supply Pipe Line (KMs)	56.42
	<b>(d) Rural Water Supply</b>	
	Repairs to pumping Machinery (Nos)	229
	Repairs to Leaking OHRs/GLSRs (Nos)	10
	Repairs to Damaged Intake Structure (Nos)	178
	Replacement of Damaged Approach Gantries/Jetties (Nos)	1
	Replacement of Damaged Pipeline (KMs)	211
	<b>(e) Irrigation - No. of Breaches/Damages</b>	
	Major Irrigation	1465
	Medium Irrigation	459
	Minor Irrigation	3123
	<b>(f) Handlooms and Textiles</b>	
	Loss of Loom Equipment (No)	47
	Loss of Yarn and Other Materials (No)	3123

<b>(g) Fisheries</b>	
(i) No of Units damaged (Boats, Nets etc.)	6260
<b>(h) Animal Husbandry</b>	
Community Animal Health Centers(no)	128
<b>(i) Sericulture</b>	
Silk Worm Rearing Sheds and Buildings	4
Fodder Seed (Qts - Mts)	934
<b>(j) AP Transco</b>	
No of Poles	3479
Conductors in KMS	182.89
DTR's / PTRs No	3139
Other Material	79

*(Source: Memorandum on "Nilam' Cyclone/Heavy rains, Government of Andhra Pradesh)*

## RESCUE & RELIEF :

The Revenue (Disaster Management) Department established a control Room in the State Headquarter and in all the District Headquarters in June, 2012. Similar steps were taken in the Revenue divisional and Taluka level, which continued during whole North-East Monsoon season. The district collectors alerted the people living in the low-lying coastal areas and other affected districts and also assisted the people to move to the safer places, in view of 'NILAM' Cyclone.

Necessary arrangements for evacuating the affected people to safer places, like cyclones shelters, school buildings, gram panchayat offices, public health centers, high schools, rice mills, cinema theatres, etc. were also made available by the district collectors. Alternate communication network, such as the Ham Radio network and satellite phones were utilized by the district administration. The district administration in coordination with Civil Supplies department arranged for adequate food stocks, including drinking water sachets, emergency lamps/ lights etc.

Medical and Health department's supplies sufficient quantities of essential medicine and 108 & 104 telephone number medical ambulance services were

made ready for providing medical facilities, first aid to the people affected. The Energy Department of the state took special care to monitor the power situation and avoided human loss due to electric shocks; short circuits etc.

Andhra Pradesh State Road Transport Corporation arranged sufficient buses for evacuation of people and supply of essentials to them. The Police and Fire departments were keeping constant vigil and were in touch with district administration. The district collectors alerted Medical and Health Dept. and Animal Husbandry Dept. These departments utilized the stock of essentials medicines and deployed medical and para medical staff, where ever and when ever required.

The Roads and Bridges and Panchayat Raj Departments kept vigil on roads and all bridges and culverts in vulnerable areas. The General Manager, South Central Railway ensured constant vigil on the railway lines, bridges etc. during the whole period of South-West monsoon. The Revenue (DM) Dept. was in touch with National Disaster Force, Army and Navy.

Further, the State Government had taken up massive relief measures for the provision of food, shelter, water, essential medicine etc. at relief campus and also to the people whose houses had been marooned. Medical teams were constituted to take necessary measures to prevent the out-break of any epidemics. Damaged infrastructure – minor irrigation sources, roads and bridges of the R&B department as well as of the Panchayat Raj Department, Rural Water Schemes, and Urban Water Supply schemes were restored on priority basis.

### **Relief:**

Relief Measures were taken up by the State on war footing. These included:-

- (i) Ex-gratia of Rs.1.50 lakh to the kin of the deceased, apart from Rs.50,000/- under *Apathbandhu Scheme* to those eligible.
- (ii) Organization of Relief Camps in the affected areas;
- (iii) Distribution of 20kg rice and 5 ltrs. of kerosene to the families whose houses have been fully and severely damaged.
- (iv) Assistance of repair/restoration of damaged houses;
- (v) Assistance for clothing and utensils to the affected families whose houses have been marooned/inundated due to excessive rainfall and flood.

- (vi) Distribution of food, milk for children and water packets in the affected areas; and
- (vii) Organization of Medical Camps in the affected areas.

The State Government organized 410 relief camps in the nine affected districts. In East Godavari 190 relief camps were organized, followed by Visakhapatnam-76, West Godavari-70, Krishna-34, Guntur-15, Vizianagaram-6, and Srikakulam-4. About 3,52,584 people were evacuated and 3,51,321 people took shelter in the relief camps. Further, about 10, 13,686 food packets and 14, 73,595 lakhs water sachets were distributed. Similarly, 1,894 Medical camps were organized / conducted for catering to the need of the people who were evacuated to the relief camps. Average duration of operation relief camps was more than five days.

Initial Preparedness was useful in saving lives as far as possible. However, more preparedness, especially community preparedness can save more lives and property. There should be more coordination between IMD and the various state agencies, who monitor the movement of such cyclones/depression. Meetings can also be held during normal period, so that these agencies are in constant touch and understand each other's way of working and to some extent the technicalities of the forecast.

The aim of an effective Disaster Management system is first to reduce the loss of life to the bare minimum and until this aim is achieved, there should be efforts to improve the preparedness and coping capacity. Long term measures should be taken to mitigate these impacts through structural and non-structural measures. The on-going World Bank assisted, National Cyclone Risk Mitigation Project, is under implementation in the state of Andhra Pradesh. The State Government should fully utilize this project to achieve the desired target, both for disaster mitigation in the coastal areas. The vulnerable areas where inundation of flood water occurs have to be mapped for future mitigation measures & preparedness among the community through community mapping.

#### **Reference:**

1. Detailed Memorandum on "Nilam' Cyclone/Heavy rains & Floods in Andhra Pradesh-2012, Revenue (Disaster Management) Department, Government of Andhra Pradesh, December,2012.



## 8. LESSONS LEARNT

The annual disaster report has attempted to compile and analyse the major disasters which caught the attention of the country in this year. Given the fact that the frequency, intensity and unpredictability of natural disasters is expected to increase as a result of climate change, it is more important than ever that we learn from the past. Going by the pattern of disasters in the specific year, it was the state of Assam which bore the impact of two disasters, which included floods and a boat tragedy. As far as the classification of disaster goes, it was the hydrometeorological disasters, mainly floods in Assam, heavy rain in Uttarkashi, heavy rains and flash floods in Himachal Pradesh, and heavy rains & floods in Andhra Pradesh due to cyclone Nilam which made its presence felt in 2012. Going by the number of lives lost and damage caused to infrastructure, it may appear that the year was devoid of a mega disaster. However, what one needs to notice is that these disasters at a local level are more or less those calamities which are recurring almost every year and their cumulative losses incurred over years would be comparable to any other mega disaster.

Floods are a recurring disaster in India. Every year, floods are experienced by the vulnerable regions of the country. When recurring disasters strike the same communities i.e. communities which have not yet recovered from the previous disaster suffers and thus the results are more devastating. The resilience of affected individuals and communities is undermined. If the communities are poor and marginalized, then it is even more difficult cope up with the disasters. The recurring disasters in 2012 highlights the need for increased commitment and investment in disaster risk reduction.

The scale of any disaster is also linked closely to past decisions taken by communities and governments, or the absence of such decisions. It needs to be realized by the government as well as by the community that even today floods are occurring almost every year resulting in death and destruction. Some initiatives have been undertaken to reduce risk, but their implementation

at the ground level is not adequate to address the concerns of the vulnerable community. We are still relying on a response driven approach to this disaster inspite of the fact that early warning can be generated before the disaster strikes. It implies that there are some major gaps in the generation of warning and its effective dissemination to the community. The government needs to strengthen this mechanism of early warning dissemination. A community that is prepared to face disasters receives and understands warnings of impending hazards and has taken precautionary and mitigation measures will be able to cope better and resume their normal life sooner. Moreover, measures for flood risk mitigation in the vulnerable areas needs to be implemented on a war footing to prevent the disaster from eroding the developmental gains every year.

The community has a greater role to play in reducing the risk of floods to the country. The vulnerability of the country to floods is aggravated by the community itself to some extent. Over the years flood plains have been taken over by human settlements. Traditional flood detention areas are now residential. Erosion, large-scale felling of forests and the spreading of concrete jungle has left the land with little capacity to infiltrate rainwater. All these factors arising from human greed has resulted in greater risk. The government, as well as the communities need to come together on a common platform to address this hydrometeorological disaster rather than waiting for it to happen every year and then responding to the destruction with a programmed approach.

The lesson which needs to be learnt from the natural disasters occurring in India is that although the country boasts of a paradigm shift of management of disasters from post disaster management to preparedness and mitigation, it is still not being reflected on the ground. We still approach disasters by focussing towards coping with the issues of post disaster management such as evacuation, communications, search and rescue, fire fighting, medical and psychiatric assistance, provision of relief and sheltering etc. After the initial trauma of the occurrence of the natural disaster is over within the first few days or weeks, the phase of reconstruction and economic, social and psychological rehabilitation is taken up by the administration. Soon thereafter the occurrence of the disaster is relegated to historic memory till the next one occurs, either in the same area or in some other part of the country. We need to understand that the proactive approach for risk reduction is by far better than seeking to restore the country to its pre-disaster status and then, waiting for history to repeat itself.

Between disaster management and disastrous management lies the shadow of our degree of preparedness and mitigation. The length of this shadow diminishes in direct proportion to the quality of our preparedness to face disasters. The paradigm shift needs to be visible at the grassroots level, which unfortunately is not the case. We do not have to be reminded time and again that a relatively smaller investment in disaster preparedness can save thousands of lives and vital economic assets, as well as reduce the cost of overall relief assistance.

The global cost of natural hazards in 2011 was estimated to be \$380 billion—resources that could have been used in productive activities to boost economies, reduce poverty, and raise the quality of life. (Learning from Mega disasters, World Bank report, 2012). No region or country is exempt from natural disasters, and no country can prevent them from occurring. But all can prepare by learning as much as possible about the risks and consequences of devastating events, and by making informed decisions to better manage both. Disaster management is increasingly important, as the global economy becomes more interconnected, as environmental conditions shift, and as population densities rise in areas around the world. A proactive approach to risk management can reduce the loss of human life and avert economic and financial setbacks. To be maximally effective, and to contribute to stability and growth over the long term, the management of risks from natural disasters should be mainstreamed into all aspects of development planning in all sectors of the economy

On the other hand, human made disasters like the Assam Boat tragedy, Railway Accident in Tamil Nadu and loss of lives at unmanned railway crossings raises the crucial issue of lack of a culture of safety prevalent in the country. Disaster management, and disaster preparedness and mitigation in particular, are issues that concern the cultural and attitudinal attributes of the government, other organizations, and the public at large. We are used to living with risk and have adopted it as a part of everyday life. This is quite evident through everyday incidents like road accidents, children bundled overboard in vehicles transporting them to schools; be it a rickshaw or a school van, and as the case of overboard boat in Assam or the way in which we travel in unreserved compartments in railways where a bursting of a cracker caused the death of 28 passengers in Tamil Nadu Express. Culture is a set of attitudes and thinking pattern which evolves over a period of time. The change in culture is a very slow process and inculcating values of safety in our existing culture will be full of challenges.

Poverty and population explosion in our country would be some of the major challenges. Hence, we need to have a vision and long term plan to address risk reduction for building a disaster resilient nation. We need to adopt a culture of safety and preparedness which permeates all aspects of national life be it physical, social or economic. We need to work on the attitudes and perception of society and individuals towards risk and make them responsible for making the things better.

If we need to develop a culture of safety, we have to target at our socialization process and inculcate positive attitudes of safety amongst our children. The message needs to be imparted at homes as well as in schools to children. Educating children can be an effective approach in ensuring the building of an alive generation, which is sensitized towards disaster risk reduction at an individual as well as at a societal level. The best time to influence the mindset of children to inculcate a culture of prevention of disasters is the time when the children are at school. Schools also form a crucial link in the community life of children. Children become harbingers of important messages to parents and community itself. Hence, the key to empower the community through knowledge, skill and attitude can be done through schools. Community should be involved, on a continuous basis, with disaster education practices in schools, for sensitizing the present generation along with the future generation in preventing hazards from becoming disasters. Let us try to show this world that our knowledge and culture can help us in coping effectively with various hazards, when we cannot prevent them from happening.

**Annexure**

**National Institute of Disaster Management**  
**Ministry of Home Affairs**  
**Disasters that have occurred during 2012**

S. No.	Date	States	Mortality Rate & injured	Damage Caused	Source
<b>Road Accidents</b>					
1.	2.01.2012	Haryana near Ambala	11 lives lost 20 injured	Ten children on their way to school were among 11 killed and 20 others injured when an overloaded van carrying them collided head-on with a truck amid dense fog on the Saha-Shahabad road near Ambala in Haryana.	DD News
2.	11.01.2012	Uttarakhand	12 lives lost	At least 12 people are feared killed in a road accident in Tehri Garhwal district of Uttarakhand. Earlier 11 people were killed in an accident in Pithoragarh on Monday when a boulder fell on a vehicle.	News on air
3.	06.02.2012	Dimapur in Nagaland	10 lives lost 36 injured	At least 10 persons were killed and 36 injured when a Shillong-bound bus plunged into a gorge near Piphima, around 40 km away from Dimapur at night. The accident took place at around 10.30 pm when the Rajdhani Travels bus coming from Churachandpur in Manipur fell into the 200-feet gorge, while negotiating a sharp turn near the Assam Rifles Camp at Piphima.	TNN
4.	08.02.2012	Karnataka	13 lives lost 6 injured	Eight people were killed in a collision, involving a Tempo Trax and a North - Western Karnataka Road Transport Corporation (NEKRTC) bus near Ittagi in Hadagali taluk of Bellary district. In two separate accidents, 13 persons lost their lives and six were injured in Hadagali taluk of Bellary district.	The Hindu
5.	08.02.2012	Mainpuri, Uttar Pradesh	26 lives lost	At least 26 people of a marriage party were killed on Tuesday evening, when an overloaded mini-bus collided head-on with a speeding truck in Uttar Pradesh's Mainpuri district. The driver of the mini-bus also died and more than a dozen others were injured.	Hindustan Times

S. No.	Date	States	Mortality Rate & injured	Damage Caused	Source
6.	10.02.2012	Basavana Betta, Karnataka	10 lives lost 14 injured	Ten people, including six women and a three-year-old child died and 14 were injured when a maxicab in which they were travelling fell into a deep ditch at Basavana Betta in the Halagur police station limits in Mandya district's Malavalli taluk in Karnataka.	The Hindu
7.	15.02.2012	Powari village in Himachal Pradesh	17 lives lost 2 injured	Seventeen personnel of the Border Roads Organisation (BRO) were killed and two others seriously injured on Tuesday when the vehicle in which they travelled from Pooh to Powari fell into a gorge at Spillow on the India-Tibet National Highway. The injured were rushed to hospitals at Pooh and Spillow, which is 330 km from here. Sources said 16 bodies were recovered, while one was trapped under the vehicle.	PTI
8.	20.03.2012	Uttar Pradesh	15 lives lost	Fifteen people were killed and two others seriously injured when the Mathura- Kasganj Express rammed into a jeep at an unmanned railway crossing in Hathras.	DD News
9.	11.04.2012	Yadgir Karnataka	12 lives lost	Twelve people, including four children, were crushed to death when the ambulance in which they were travelling collided with a lorry near Dadesugur village in Raichur district's Sindhanur taluk.	The Hindu
10.	16.04.2012	Belgaum Karnataka	10 lives lost	Ten persons were killed when a goods carrier by which they were travelling hit a stationary lorry near Bidaki village on Belgaum-Bagalkot road in Katkol.	The Hindu
11.	20.04.2012	Namakkal Tamil Nadu	13 lives lost 25 injured	Thirteen persons, including nine women, were killed and 25 others injured when a van collided with a private bus on the Rasipuram- Atayampatti main road in Rasipuram taluk in Namakkal district.	The Hindu
12.	29.04.2012	Khammam Andhra Pradesh	11 lives lost 10 injured	The ghastly accident that occurred at Turubaka in Khammam district on Saturday. Eleven persons were killed and ten were injured in four different accidents in Kadapa and Khamman on Saturday.	The Hindu

S. No.	Date	States	Mortality Rate & injured	Damage Caused	Source
13.	30.04.2012	Gorakhpur Uttar Pradesh	20 lives lost more than 20 injured	At least 20 people were killed and more than 20 others critically injured when a government bus collided head-on with a private bus in Maaniram area of Gorakhpur district.	DD News
14.	02.05.2012	Nallakalva Andhra Pradesh	10 lives lost	Ten members of a family hailing from Bangalore were killed in a ghastly road accident at Nallakalva near Atmakur in Kurnool district. According to reports reaching here, Venkatesh and his family were on a pilgrimage to Srisailam and Mahanandi after visiting Hyderabad.	The Hindu
15.	07.05.2012	Moga, Punjab	18 lives lost	18 persons were killed in a road accident near Moga on Sunday night. The incident occurred when the jeep, in which the victims were traveling, collided head on with a truck coming from Ferozpur side.	News on air
16.	22.05.2012	Penneconda (Andhra Pradesh)	15 lives lost 70 injured	Fifteen persons were killed and 70 others injured when the Bangalore-bound Hampi Express overshot a signal and collided with a stationary goods train at Andhra Pradesh's Penneconda station.	Times of India
17.	31.05.2012	Karnataka	10 lives lost 2 injured	Ten persons were killed and two others injured in a collision between a car and a goods carrier at Nippani town in the district.	The Hindu
18.	16.06.2012	Rajasthan	15 lives lost more than 40 injured	Fifteen persons were killed and more than 40 injured at Sanchore in Rajasthan's Jalore district when the bus in which they were travelling caught fire after colliding with a tanker. The casualties were mostly those inside the bus while the injured were reportedly travelling on the roof of the bus. Sanchore is a township near the India-Pakistan border.	The Hindu
19.	16.06.2012	Maharashtra	32 live lost 14 injured	An untoward incident struck a pilgrim group when at least 32 people were killed and 14 injured when a private bus carrying pilgrims fell off a river bridge near Osmanabad town on early Saturday morning.	The Sunday Indian

S. No.	Date	States	Mortality Rate & injured	Damage Caused	Source
20.	23.06.2012	Uttar Pradesh	0	At least 15 people were killed and 24 others injured, two of them critically, when a bus rammed into a tree on Amroha-Joya road. The incident took place when the overloaded bus coming from Haridwar was on its way to Kamalpura village in Sambal district.	Asian Age, Amroha
21.	26.06.2012	Uttar Pradesh	14 lives lost 18 injured	The worst accident, which killed 14 persons and injured 18, occurred under the Didauli police station in Amroha district in Western UP.	The Tribune
22.	12.07.2012	Shillong (Meghalaya state)	15 live lost	Emdat	
23.	16.07.2012	Jammu & Kashmir	15 lives lost 18 injured	Fifteen persons were killed and 18 injured when a bus ferrying Amarnath pilgrims from the Kashmir Valley plunged into a 300-feet deep gorge on Jammu- Srinagar National Highway in Ramban district after the driver allegedly fell asleep.	The Hindu
24.	23.07.2012	Mizoram	18 lives lost 17 injured	At least 18 people were killed and 17 others injured when a bus fell into a deep gorge after being hit by a massive landslide near Keifang village, about 100 km east of Aizawl in the wee hours on Saturday.	DD News
25.	30.07.2012	Haryana	29 lives lost many other were injured	In Haryana 29 people were killed in a road accident in Bhawanidistrict. Many other were injured as the canter in which they were travelling collided head on with a truck near village Sainiwash at Hisar-Rajgarh road.	News on air
26.	01.08.2012	Uttarakhand	22 lives lost 30 injured	In Uttarakhand, 22 persons were killed and over 30 injured in a road accident. The accident occurred when passenger bus on way from Anol to Vikasnagar fell into a gorge near Chilhal.	News on air
27.	03.08.2012	Kurukshetra, Haryana	12 lives lost 11 injured	In Haryana, 12 people were killed and 11 injured when a state roadways bus collided with a canter near Ladwa in Kurukshetra district.	News on air

S. No.	Date	States	Mortality Rate & injured	Damage Caused	Source
28.	09.08.2012	Meghalaya	31 lives lost 27 injured	Thirty-one passengers were killed and 27 injured when a bus proceeding from Guwahati to Agartala fell into a 400-foot-deep gorge in East Jaintia Hills district of Meghalaya.	The Hindu
29.	12.08.2012	Chamba, Himachal Pradesh	52 lives lost 45 injured	Fifty-one passengers were killed and 46 injured when an overcrowded private transport bus veered off the road and fell into a 300-foot-deep gorge near Chamba.	The Hindu
30.	23.08.12	Ahmadabad, Gujarat	15 lives lost 53 injured	Fifteen persons were killed and 53 injured, when a tractor-trolley fell into a deep roadside ditch near the famous Ambaji temple in Banaskantha district of north Gujarat.	The Hindu
31.	02.09.2012	Challakere taluk Karnataka	12 lives lost 3 injured	Twelve people were killed in three separate accidents on Monday in Challakere taluk of Chitradurga district. Two persons died on the spot and three others were injured when the car in which they were travelling overturned at Hirehalli village in the taluk.	The Hindu
32.	11.09.12	Palampur, Himachal Pradesh	34 lives lost 3 injured	The toll in the bus accident near Malli on the Palampur-Ashapuri road near Palampur rose to 34 on Tuesday with authorities recovering 20 more bodies. Five others, including two women and a child, were seriously injured in the mishap which took place when a Himachal Road Transport Corporation (HRTC) bus rolled 1000 ft down into a deep gorge.	DD News
33.	27.09.2012	Buldhana, Maharashtra	24 lives lost 30 injured	Twenty-four passengers were killed and over 30 injured, some of them seriously, when a state transport bus fell into Purna river in Maharashtra's Buldhana district.	DD News
34.	22.11.2012	Churu, Rajasthan	13 lives lost 39 injured	Thirteen persons died and 39 others injured in a road accident in Churu district in Rajasthan. The accident occurred near Sardarshahar on Kishangarh-Hanumangarh Mega Highway this morning when a private bus collided with a truck.	News on air

S. No.	Date	States	Mortality Rate & injured	Damage Caused	Source
35.	23.11.2012	Gurdaspur, Punjab	14 lives lost 39 injured	At least 14 persons, three of them from Gurdaspur district, were killed and 39 injured when a truck carrying fruit and vegetables collided head-on with a luxury bus at Hariyasar.	The Tribune
36.	24.11.2012	Sirmaur, Himachal Pradesh	11 lives lost 15 injured	Eleven people were killed and fifteen injured when an overcrowded multiutility vehicle carrying locals fell into a gorge near Timbi on BakhaliTimbi road of Sirmaur district of Himachal Pradesh.	PTI
37.	25.11.2012	Udhampur, Jammu and Kashmir	18 lives lost 64 injured	The death toll in Saturday's bus accident in Udhampur district of Jammu and Kashmir has risen to 18. Sixty four people are injured and have been admitted in various hospitals of Udhampur and Jammu districts.	News on air
38.	04.12.2012	Nandagudi Karnataka	11 lives lost	Eleven persons died and 15 were injured when a minibus collided with a KSRTC bus at Nandagudi in Hoskote taluk, about 30 km from here.	The Hindu
39.	12.12.2012	Tripura	10 lives 4 injured	At least ten people, including three women and a child, were killed and four others injured when a jeep collided with a truck in West Tripura district.	News on air
40.	18.12.2012	Jammu and Kashmir	11 lives lost	In Jammu and Kashmir, at least 11 persons were killed and two minors critically wounded in a tragic road mishap in mountainous Reasi district of Jammu division.	News on air
41.	18.12.2012	Madhya Pradesh	18 lives lost	Eighteen persons, including half a dozen women and three girls, were killed in a road accident. The accident, involving four vehicles, took place near Maihar Cement plant in Maihar tehsil of the district. A car was hit by a truck from behind, killing all its four occupants on the spot.	News on air
42.	18.12.2012	Khammam, Andhra Pradesh	10 lives lost	Hyderabad: At least ten persons, including four women, were killed when the vehicle in which they were travelling collided head-on with a lorry on the outskirts of Kothagudem in Khammam district of Andhra Pradesh.	PTI

S. No.	Date	States	Mortality Rate & injured	Damage Caused	Source
<b>Others</b>					
1.	02.01.2012	Tamil Nadu	26 lives lost	Thane Cyclone, which crossed the Tamil Nadu coast, claimed 26 lives and hit the power distribution in Cuddalore district. Restoration of life in Cuddalore district, which had witnessed extensive damage following the very severe cyclone, has been the priority of the State administration.	The Hindu
2.	17.01.2012	Andhra Pradesh	15 lives lost	Andhra Pradesh is in the grip of the most severe cold wave in its recorded history which during the last two days has claimed 15 lives. Five people died in Karimnagar district, and four each in Visakhapatnam and Guntur districts.	IANS
3.	11.02.2012	Andhra Pradesh	10 lives lost	At least 10 patients have died since Friday night at government-run hospitals in Andhra Pradesh where emergency services are crippled following a strike.	IANS
4.	23.02.2012	Kashmir	16 lives lost	Five junior commissioned officers were among 16 Army personnel killed in two massive avalanches that struck military posts along the Line of Control in central and north Kahshmir. Three soldiers are still reported missing.	The Hindu
5.	30.03.2012	Maharashtra and Rajasthan	21 lives lost	Fresh outbreaks of dreaded H1N1 virus have surfaced in Maharashtra, Rajasthan and some other states claiming at least 21 lives in the last three months.	DD News
6.	30.04.2012	Andhra Pradesh and West Bengal	26 lives lost	Lightning claimed 26 lives in Andhra Pradesh and West Bengal. In Andhra Pradesh, 17 people were killed in different districts after being struck by lightning.	News on air
7.	05.05.2012	Odisha	14 lives lost	At least 14 people, including four women, were killed and ten injured after being struck by lightning in different parts of Odisha.	The Hindu
8.	12.05.2012	West Bengal	11 lives lost	Eleven persons, including a woman and a child, were killed by lightning in West Bengal's Uttar Dinajpur and Malda districts. Nine persons died in Karandighi Block of the Uttar Dinajur district while two died in the Chanchol subdivision and Gajole block in neighbouring Malda district.	The Hindu

S. No.	Date	States	Mortality Rate & injured	Damage Caused	Source
9.	24.05.2012	Gujarat	40 lives lost	At least 40 people have been killed in the heatwave in Gujarat in the last four days as the mercury continued to rise above 45 degrees Celsius in most parts of the State, barring coastal areas.	The Hindu
10.	07.06.2012	West Bengal	15 lives lost	Heat wave in West Bengal kills 15 more deaths were reported from West Medinipur district over the last three days, while one more occurred in Bankura.	The Hindu
11.	05.07.2012	Madhya Pradesh and Punjab	10 lives	Ten persons succumbed to the heat wave in Madhya Pradesh and Punjab on Wednesday even as the prevailing hot and humid conditions in North India and Western India, coupled with unscheduled power cuts, made life miserable for people.	The Hindu
12.	14.09.2012	Uttarakhand	12 lives lost	Heavy damage to life and property has been caused in Rudraprayag and Bageshwar districts of Uttarakhand in different incidents of cloud-burst and incessant heavy rain. In Ukhimath Tehsil of Rudraprayag, 12 persons have died while about 35 people are buried under the debris after a cloud-burst occurred in 6 villages.	News on air
13.	20.09.2012	Uttar Pradesh	18 lives lost	During the past 24 hours, 18 persons lost their lives in rain-related incidents in different parts of Uttar Pradesh where a belated monsoon has caused moderate to rather heavy rainfall, disrupting normal life.	The Tribune
14.	14.01.2012	Madhya Pradesh near Ratlam	10 lives lost	At least 10 people were killed when a stampede broke out in Hussain Tekri near Jaora town in Madhya Pradesh's Ratlam district on the occasion of Chellum, a Muslim religious observation that comes after Moharram.	DD News
15.	21.01.2012	Jharkhand	13 lives lost	Thirteen policemen were killed and two others injured on Saturday when their vehicle was blown up by Maoists in the jungles of Bariganwa in Garhwa district of Jharkhand.	DD News

S. No.	Date	States	Mortality Rate & injured	Damage Caused	Source
16.	11.02.2012	Odisha	36 lives lost	The death toll in the hooch tragedy has increased to 36 with the death another person in the SCB Medical College and Hospital at Cuttack. About 66 people, who fell ill following drinking of spurious liquor are still under treatment in different hospitals in Bhubaneswar. At least six persons have lost vision after consuming the spurious liquor.	New on air
17.	24.03.2012	Bihar	10 lives lost	At least 10 children died in a village in Bihar's Madhubani district due to a disease commonly referred as 'khasra' or measles, an official said Saturday. Eight children have died over the past few days. In the last 24 hours, two children have died of the khasra.	Zee news
18.	28.03.2012	Maharashtra	12 lives lost	Twelve Central Reserve Police Force (CRPF) jawans were killed and 28 injured when suspected Maoists triggered a landmine blast at Pushtola in Gadchiroli district, Maharashtra.	The Hindu
19.	30.04.2012	Assam	205 lives lost 150 injured	In Assam, four more bodies have been recovered in the boat-capsize tragedy in the river Brahmaputra. With this the number of bodies recovered from the river has gone up to 205 and 150 injured. The boat capsized last evening in the river due to a heavy storm at Burha-Burhi district. Over 200 people are still reported missing in the boat carrying over 300 passengers.	News on air
20.	14.06.2012	Tamil Nadu	36 lives lost	A total of 2,566 persons in the State were afflicted with dengue fever and 36 succumbed to the disease, according to the Health Department. Similarly, 204 persons in the State have so far been infected with A (H1N1) and five had so far died of the infection.	The Hindu
21.	15.06.2012	Gujarat	24 lives lost	Twenty-four people including eight children were killed while 15 others injured when their truck overturned on the Sanand-Viramgam Highway in the district.	The Asian Age

S. No.	Date	States	Mortality Rate & injured	Damage Caused	Source
22.	25.06.2012	Uttar Pradesh	15 lives lost	At least 15 people were killed and 24 others injured two of them critically, when a bus rammed into a tree on Amroha-Joya road in the wee hours on Monday.	The Asian Age
23.	30.07.2012	Andhra Pradesh	35 lives lost 26 injured	In Andhra Pradesh, 35 persons have been charred to death and 26 injured when the Chennai bound Tamil Nadu express caught fire between Nellore and Vedaypalem on Vijayawada-Gudur section during the early hours.	News on air
24.	05.08.2012	Assam	12 lives lost	12 inmates, including five children in the age group of one-eight, have died due to various ailments in relief camps in the four violence-hit districts of Kokrajhar, Chirang, Dhubri and Bongaigaon, where diarrhoea and dysentery cases have been reported.	The Hindu
25.	07.08.2012	Tamil Nadu	10 lives lost	The death toll at a construction site yesterday at Kanchipuram near Chennai has risen to ten, The migrant labourer who was admitted in a serious condition in a hospital at Chennai succumbed to his injuries.	News on air
26.	31.08.2012	Kerala	11 lives lost	In Kerala the death toll in the LPG tanker explosion near Chala in Kannur district has gone up to eleven. Eight people are still in various hospitals in a critical situation. The accident took place on Tuesday causing injuries to about 40 people.	News on air
27.	26.09.2012	Assam	18 lives 10 missing	The flood situation in most of the districts of Assam remains grim. So far 18 people have died and 10 went missing in flood related incidents. The number of affected people due to flood wave has gone up to around 21 lakhs in 16 districts.	News on air
28.	23.12.2012	Uttar Pradesh	591 lives lost in a year	Two children succumbed to encephalitis in a government hospital here pushing the death toll due to the viral infection in the eastern region of Uttar Pradesh to 591 this year.	PTI

## NIDM ACTIVITIES 2012

**1. NIDM team visited Cyclone 'Thane' affected Region (16 - 21 January 2012, Tamil Nadu & Puducherry)**

A two member team of NIDM (Hydro Meteorological Division) comprising Dr K.J Ananda Kumar, Associate Professor and Head of Division and Mr Biswanath Dash, Assistant Professor visited the cyclone affected areas of Cuddalore District, Tamil nadu and the UT of Puducherry during 16-21 January 2012 to study the causes, the impact and lesson learnt.



*D. K.J. Anandha of NIDM during the visit interacting with the local administration and Community.*

**2. National Workshop on Sikkim Earthquake (09 February 2012, New Delhi)**

NIDM organized a one-day brainstorming national workshop on 9th February 2012 at its premises in Delhi to synthesize different expert's comments, feedback and suggestions for formulating guiding road map for recovery, rehabilitation and redevelopment of the affected area.



*Dr. H.K. Gupta, Hon'ble Member NDMA was the Chief Guest for the inaugural session of the workshop.*

**3. Joint Indo-Japanese Training cum Field Workshop on Landslides and Disaster Management (13 - 17 February 2012, Sikkim)**

NIDM organized 2nd Indo-Japanese Training cum Field Workshop at Gangtok, Sikkim during 13-17 February 2012, jointly with Land Revenue and Disaster Management Department, Government of Sikkim. The programme was inaugurated by the Chief Secretary, Government of Sikkim in the presence of Member of Parliament, Ministers, Parliamentary Secretary, and Secretaries from various other departments, district magistrate, city mayor and other dignitaries etc., Ninety six participants, including nineteen Japanese delegates attended the workshop.



*Prof. Chandan Ghosh of NIDM presenting his views during the workshop.*

**4. 3rd NIDM-UNSPIDER Training Workshop on Space Technology Applications in Disaster Risk Reduction and Emergency Response (02 - 04 April 2012, New Delhi)**

NIDM and UNSPIDER jointly organized the 3rd training workshop on "Space Technology Applications in Disaster Management and Emergency Response" during 02-04th April 2012 at NIDM, New Delhi. This workshop was aimed at bridging the gap between the disaster management functionaries and providers of space based data and geo-spatial applications.



*Group photo of the three days training programme on space Technology Applications in Disaster Risk Reduction and Emergency Response.*

**5. Training programme for MCD Engineers of Delhi on “Seismic Safety Assessment of Buildings in Delhi by Rapid Visual Screening” (24 – 27 April 2012, New Delhi)**

National Institute of Disaster Management organized a state level Training programme on “Seismic Safety Assessment of Buildings in Delhi by Rapid Visual Screening”, from 24-27 April 2012 for MCD Engineers of Delhi. The programme was inaugurated by Shri Tejendra Khanna, Hon'ble Lt. Governor Delhi and presided over by Shri M. Shashidhar Reddy, Hon'ble Vice Chairman, National Disaster Management Authority.



*Shri Tejendra Khanna, Hon'ble Lt. Governor, Delhi, addressing the dignitaries and participants during the inaugural session of the training.*

**6. NIDM participated in IPCC SREX Event (02 - 03 May 2012, New Delhi)**

NIDM participated in the event “Managing the Risks of Climate Extremes and Disasters in Asia - What can we learn from the IPCC Special Report? “ held at Le Meridian Hotel, New Delhi, India on 2-3 May 2012. The new IPCC Special report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation (SREX) was tabled in the event. Executive Director, NIDM, made a presentation on various initiatives taken by the institute in the field of Climate Change Mitigation and Adaptation.



*Executive Director, NIDM presented initiatives taken by institute in the field of Climate Change mitigation and adaptation.*

**7. Workshop on “Disaster Management in SAARC Nations” (22 - 24 May 2012, Dhaka, Bangladesh)**

The International Search and Rescue Advisory Group (INSARAG) organized a three days' workshop on disaster management in SAARC nations at Dhaka, Bangladesh. The workshop was attended by about 40 senior level officers of SAARC member states. NIDM was represented by ED, in the workshop.



Hon'ble Minister Home of Bangladesh

Ms. Shahara delivering inaugural address during the workshop on Disaster Management in SAARC Nations.

**8. World Environment Day Function (05 June 2012, New Delhi)**

National Institute of Disaster Management (NIDM) observed the “World Environment Day” on the theme “Safeguard Environment for Disaster Reduction” on 5th June 2012 at the Auditorium of SCOPE Complex, Lodi Road, New Delhi. The objective of the event was to generate awareness on safeguarding environment for disaster risk reduction. The focus of the event was on climate change and its impact on hydro-meteorological disasters like floods, drought, forest fire, cyclone and epidemics. Book for children learning on Disaster management was released during the function.



Release of work book on Disaster Management for school children during the World Environment Day function.

**9. Validation Consultation for customized Modules of Incident Response System (04 - 15 June 2012, New Delhi)**

NIDM being the nodal Institution for training and institutionalization of Incident Response System (IRS), organized the Validation Consultation for customized modules of IRS in collaboration with United States Agency for international Development (USAID) and the U.S. Forest Service (USFS). The validation consultation was held at Hotel Taj Vivanta, New Delhi during 4-8 June and at National Institute of Disaster Management, during 11-15 June.



*Dr. Satendra, Executive Director, NIDM, Mr. Garry Robbin, USAID, consultants and representatives from NDMA, MHA, NIDM and States participating during the validation consultation on June 4, 2012.*

**10. Training Programme on Emergency Operation Centres (EOC) (25 - 29 June 2012, New Delhi)**

National Institute of Disaster Management (NIDM) in collaboration with the United States Agency for International Development (USAID) conducted a five days Training Programme on Emergency Operation Centres (EOC) during June 25 - 29, 2012 at NIDM under Disaster Management Support (DMS) Project being implemented by the Ministry of Home Affairs. Mr. Garry Robbins of USAID highlighted on the progress made in IRS training and institutionalization in India under the collaborative arrangement. The objective of the said training programme is to impart necessary knowledge and functioning of the EOCs/Control Rooms in post-disaster as well as



*Mr. Steve Heil, USFS, conducting sessions during the training programme.*

pre-disaster phases. The programme was facilitated by Resource Persons from the United States Forest Service (USFS) and coordinated by Shri Arun Sahdeo, consultant of NIDM.

**11. NIDM participated in International Workshop on Kosi Basin Programme (KBP) Phase I, (03 - 05 September 2012, ICIMOD HQ, Kathmandu, Nepal)**

Dr. Anil K Gupta, Associate Professor of NIDM, participated in the International Workshop on Kosi Basin Programme (KBP) Phase 1 (03-05 September, 2012, ICIMOD HQ, Kathmandu, Nepal) as rapporteur of the hazard risk mitigation lead group, and delivered a special address to the workshop on challenges of hydro-meteorological disasters in Kosi Basin and downstream with perspectives of policy planning and research.



*International workshop on Kosi basin programme in progress*

**12. NIDM participated in "EAS Seminar on Capacity Building for Disaster Preparedness" (17 - 21 September 2012, Beijing, China)**

Dr. Satendra, Executive Director attended "EAS Seminar on Capacity Building for Disaster Preparedness" during 17 to 21, September 2012, in Beijing, China. The seminar was attended by representatives of more than

12 countries and international organizations. The seminar was organized by the Government of People's Republic of China intended to share the knowledge of participants and their experiences in disaster preparedness capacity building, promote mutual understanding and communication among the participating countries about disaster preparedness laws and regulations, organizational structure, materials reservation etc



*EAS Seminar on capacity Building for Disaster Preparedness*

**13. NDMA and NIDM observed “Disaster Reduction Day (10 October 2012, New Delhi)**

NDMA & NIDM observed “Disaster Reduction Day” on the 10th October, 2012 at New Delhi. This is in line with the United Nations’ (UN) International Day for Natural Disaster Reduction which is annually observed to raise public awareness on the issues related to disaster risk reduction. The theme for the Disaster Reduction Day of 2013 was “School Safety”. The occasion was graced by Shri. T. Nanda Kumar, Hon’ble Member, NDMA, Dr. Muzaffar Ahmed, Hon’ble Member, NDMA and Shri A.K. Mangotra,



*Release book on Slogans and Poem on Safe guard environment for disaster risk reduction during the DRR day.*

Secretary (BM), Ministry of Home Affairs and other dignitaries, officials & children.

#### **14. EAS Workshop (08 - 09 November, New Delhi)**

NIDM along with Ministry of Home Affairs & Ministry of External Affairs organized “EAS-INDIA Workshop - 2012: Building Regional Framework for Earthquake Risk Management” for EAS region.



*Group Photo of EAS-INDIA Workshop – 2012*

#### **15. NIDM Participated in IITF (14 - 27 November 2012, New Delhi)**

First time since its establishment, NIDM took part in the International Trade Fair-2012 held at Pragati Maidan November from 14th to 27th, 2012. NIDM along with National Disaster Management Authority (NDMA) & National Disaster Response Force (NDRF) displayed its products and activities i.e. Training, Conferences and the Modules published by NIDM. NIDM also distributed thousands of awareness materials.



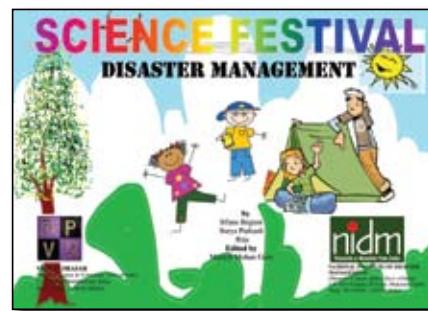
*NDMA and NIDM stall at Pragati Maidan was a centre for attraction, especially for children.*

## NIDM PUBLICATIONS – 2012

### **Work Book on Disaster Management for children**

Authors: Irfana Beghum, Surya Prakash & Rita

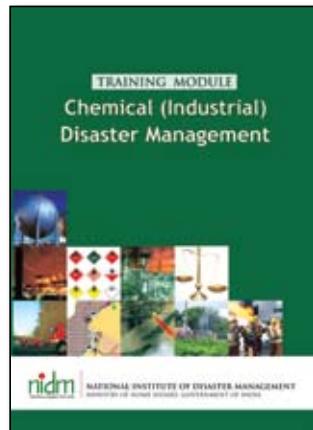
A work book on Disaster Management is developed jointly by NIDM and Vigyan Prasar to generate awareness amongst the school children regarding the hazards, vulnerability and disasters. This book also provides “do’s and dont’s” for specific hazards like earthquake, flood, fire, landslides etc.



### **Training Module on Chemical (Industrial) Disaster Management.**

Authors: Anil K. Gupta & Sreeja S. Nair

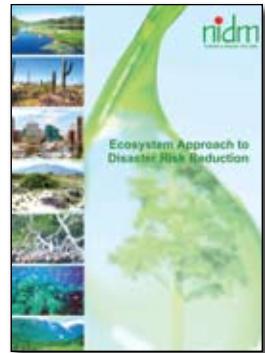
Training Module on Chemical (Industrial) Disaster Management is developed by the institute for the use by institutions engaged in training on Chemical (Industrial) Disaster Management. The module gives description of the learning units, objective, target group, duration, training and performance aids and tips for the trainers. This publication is having 5 modules, viz. Introduction, Legal Framework for Chemical Disaster Management, Field Exposure and Onsite Planning, Tools, techniques and Methods. The module contains sample schedule, pre-training assessment and evaluation formats as its annexure.



## **Ecosystem Approach to Disaster Risk Reduction**

Editors : Anil K. Gupta & Sreeja S. Nair

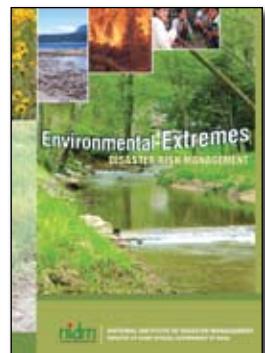
This book is an overview of the concept of Ecosystem Approach to Disaster Risk Reduction (Eco-DRR), with case studies on natural resource management and disaster linkages, focussing on Eco-DRR concepts in various phases of disaster management, including post disaster recovery in wide range of human environmental settings. Chapters cover coastal, mountain and urban ecosystems and specific hydrometeorological risks like floods, forest fire, epidemics, EIA and post disaster environmental management aspects.



## **Environmental Extremes and Disaster management : Addressing Climate Change**

Editors : Anil K. Gupta & Sreeja S Nair

This publication gives a glimpse of climate change related disaster management issues in South Asia, and more particularly in India. This publication is built on the theme chosen by the National Institute of Disaster Management (NIDM) for the world environment day, “Safeguard the environment for disaster risk reduction,” which reflects the pressing need for arresting environmental degradation and improving management of ecosystems and natural resources for achieving disaster risk reduction and adapting to climate risks. It is intended to be used as a reference for the local policy makers and planners, and in general for people at large who try to concisely on challenges, issues and solutions for climate change – adaptation and its integration with disaster risk management.

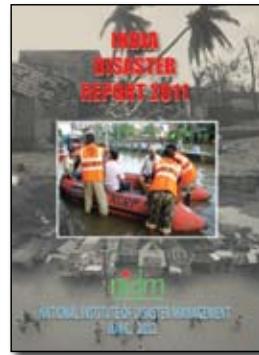


## **India Disaster Report 2011**

Dr. K. J. Anandhakumar, Dr. Ajinder Walia and Mr. Shekhar Chaturvedi

India has witnessed an increase in the frequency and intensity of disasters in the past resulting in widespread devastation. Many of the disasters, particularly in

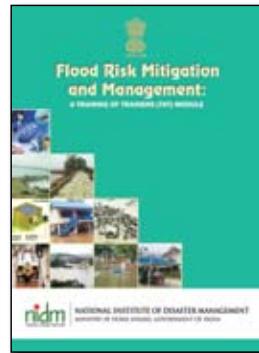
remote areas, go unreported because local administration lack the technical and human resources for community-level disaster monitoring and are not able to fully identify or map potential local hazards or develop the appropriate disaster management plans. Losses from low-intensity, but more extensive disaster events continue to affect housing, local infrastructure, and large numbers of people. These disasters at the local level are so frequent that many communities accept them as an integral part of their existence and with varying degrees of success, learn to live with them. During the year 2011-12, 14 States and one Union Territory reported damage to various disasters like cyclonic storms, heavy rains, floods, landslides, earthquakes, etc. in varying degrees. These states were Assam, Bihar, Goa, Gujarat, Himachal Pradesh, Karnataka, Kerala, Maharashtra, Odisha, Punjab, Sikkim, Uttar Pradesh, Uttarakhand, West Bengal and Union territory of Puduchery. India disaster report 2011 is an effort to systematically collect, collate, analyze and document the disaster happened in India during the 2011 and the lesson learned from them.



### **Flood Risk Mitigation & Management: A Training of Trainers Module**

Author : Dr. A. D. Kaushik

“Flood Risk Mitigation & Management, Training of Trainers Module” has been developed with the technical support of Central Water Commission, New Delhi to conduct the training programmes on flood for senior & middle level Officers of various sectors of Central and State Governments and trainers of various training institutes engaged in disaster management-There are five modules viz., Flood Disaster Management System in India; Flood Mitigation; Flood Preparedness; Flood Response and Cross Cutting Issues & Lessons Learnt. Each module has further been classified as sub modules i.e. learning units to cover the related issues of flood risk mitigation and management. This module can be used as a guide book by trainers who have already undergone the training or involved in conducting training programmes on disaster management. The module is self-explanatory and complete, and a person new to the subject can also use

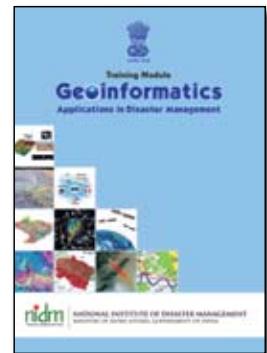


it effectively. The organizations such as Disaster Management Centres located in State Administrative Training Institutes (ATIs), National Disaster Response Force (NDRF), State Institute of Rural Development (SIRDs) and other training institutes at regional and district levels in the above-mentioned departments, people working in NGOs/CBOs and social organizations, volunteers in NCC, NVKS, NSS may be the potential users of the module.

### **Training modules on Geoinformatics Applications in Disaster Management**

Author : Sreeja S. Nair

This training modules on Geoinformatics Applications in Disaster Management has been prepared as a training guide for building the capacity of technical professionals and disaster managers to optimally use Space Technology, The module would help the participants to acquire knowledge and basic skills of effectively utilizing geoinformatics in managing disasters. The module is tested for technical experts representing state remote sensing application centres, research development organizations, administrators etc. In addition it can also be used by other training facilitators and self-learners as well. Based on needs assessment and feedback from the national, state and district level technical professionals and Disaster Managers the module is presented as a series of units containing introduction to Geoinformatics as well as applications in various phases of disaster management i.e. pre, during and post disaster phases. The module has two Annexures, Annexure I containing formats and Annexure II: Practical manual developed using widely used proprietary software like Arc GIS, ERDAS and ENVI as well as in open source products like Quantum GIS , ALOHA, Marplot, Google Earth.

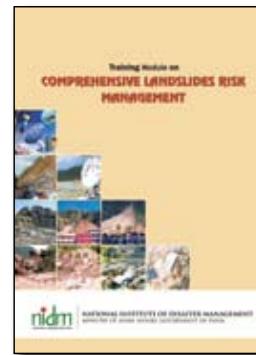


### **Training Module on Comprehensive Landslides Risk Management**

Author : Dr. Surya Prakash

The module on “Comprehensive Landslides Risk Management” is developed for five day training course focusing on imparting basic and requisite knowledge / skills needed by different stakeholders at various levels in the field of Landslide

Management. This module is divided into 14 submodules. The module is developed with inputs from Geological Survey of India (GSI), Border Roads Organization (BRO) Central Road Research Institute (CRRI), Advanced Technical Engineering Services (ATES), Central Building Research Institute (CBRI), Snow and Avalanches Studies Establishment (SASE), Wadia Institute of Himalayan Geology (WIHG) and Community Based Disaster Risk Management society (CBDRMS). The module has been designed with multi- hazards risk management approach and briefly discusses various types of vulnerabilities in a holistic manner. The document will provide an insight to the trainees about landslides and measures required for reducing the risks at different levels.



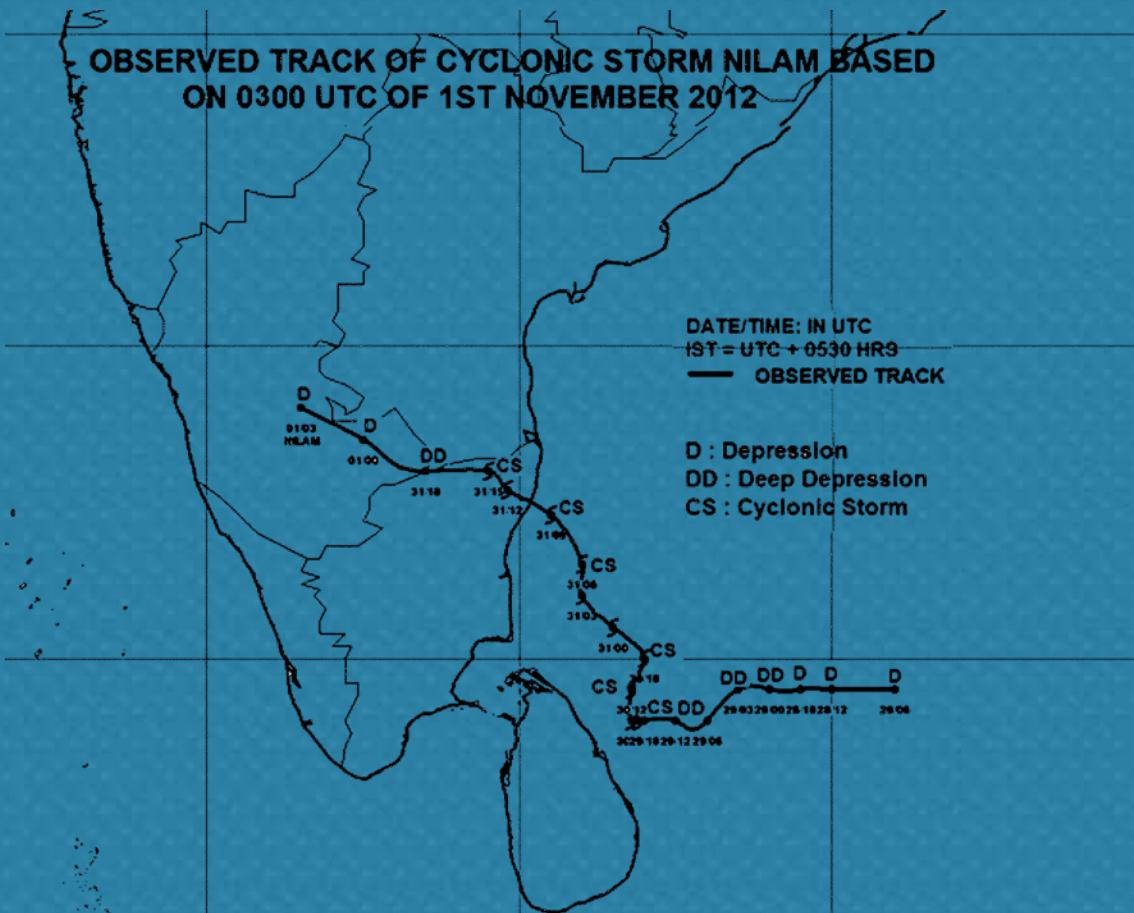
**NIDM faculty's book on Disaster Management released**

Shri Mullappally Ramachandran, Hon'ble Minister of State for Home Affairs, Government of India released the book entitled, "Disaster Management - Engineering & Environmental Aspects" by Dr. H. Sarvothaman & Dr. K.J. Anandha Kumar (Associate Professor, NIDM) of Asiatech Publishers Inc, in the presence of Shri T.V.R. Shenoy, Eminent journalist and Padma Bhushan Awardee. Disasters that are caused due to the natural phenomena and the human activities are dealt with in this book. Among the natural phenomena, the dynamics of natural disasters such as earthquake, volcano, tsunami and seismically-triggered landslide, Cyclone, floods, El Nino, drought and landslides are explained. Fundamental of Plate Tectonics which is the root for the natural disasters is summarized. Basic information on Seismology, including definitions of terminology in earthquake science is an important feature of this book. Major disasters that occurred as a result of anthropogenic hazards are highlighted and the management measures of such disasters are also discussed. The disasters due to degradation of environment such as global warming, 'enhanced greenhouse effect', acid rain and ozonedepletion, air pollution and noise pollution, disaster due to water scarcity are included and measures for their management in Indian context in particular are also included Book being released by Hon'ble Minister of State for Home Affairs Shri Mullappally Ramachandran in the book. This book is meant for students of B.Tech./ M.Tech, B.E., B.Arch., Environmental Study, B.Sc, M.Sc Library Reference, General Reference.



*Book being released by Hon'ble Minister of State for Home Affairs  
Shri Mullappally Ramachandran*






  
 Towards a disaster free India.....

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