

INDIA DISASTER REPORT

2011

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National Institute of Disaster Management
JUNE, 2012

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Dr. SATENDRA, IFS
Executive Director

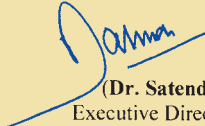
FOREWORD

It is always worthwhile for any organization to review and analyse the challenges it faced and the emerging trends it observed during the previous year. The activity is especially vital for an organization like the National Institute of Disaster Management which has been constituted under the Disaster Management Act 2005 and entrusted with the responsibility human resource development, capacity building, training, research, documentation and policy advocacy in the field of disaster management. The reflection of the past becomes extremely crucial to be able to march ahead confidently in future.

While we cannot prevent natural phenomena, we can definitely limit their repercussions on the society. The challenge in facing these natural hazards is to find a way to live with these phenomena rather than die from them. Earthly powers are a fact of life and one side of the coin of a good life. A natural disaster is only a disaster because people are in the wrong place at the wrong time, had no choice but to be in the way of a disaster or were caught unawares when it struck.

The scale of any disaster is also linked closely to past decisions taken by communities and governments, or the absence of such decisions. Pre-emptive risk reduction is the key. Sound response mechanisms after the event, however effective, are never enough. It highlights the need for much greater attention on implementation of protective strategies which can contribute to saving lives and protecting property and resources before they are lost. Despite its negative consequences, a disaster also offers a good opportunity to formulate forward looking policies pertaining to social development, economic growth, environmental quality and justice, in addition to other essential values that contribute to sustainability. We need to regularly re-evaluate what is working in the sector of Disaster Management, what can be improved and what tomorrow might bring. 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.

Keeping this in view, NIDM has initiated the process of compilation of India Disaster Report. This report is the first report being published by the Institute for the year 2011. It is hoped that the publication of this report will stimulate improved data collection and research which can enable the gaps identified in the management of the disasters to be addressed in future. The report draws on lessons learnt from the disasters of 2011 reflecting a common concern in building disaster resilient communities and reducing human, social, economic and environmental losses due to natural hazards.


(Dr. Satendra)
Executive Director

Introduction

India, with its unique geophysical setting and socio-economic conditions is highly vulnerable to disasters. The country is prone to disasters due to number of factors, both natural and human induced, including adverse geo-climatic conditions, topographic features, environmental degradation, population growth, urbanization, industrialization, flawed development practices, etc. As far as the geographic dimensions of the country are concerned, the five distinctive regions of the country i.e. Himalayan region, the alluvial plains, the hilly part of the peninsula, and the coastal zone have their own specific problems. While on one hand the Himalayan region is prone to disasters like earthquakes and landslides, the plain is affected by floods almost every year. The desert part of the country is affected by droughts while the coastal zone is susceptible to cyclones and storms. If we analyse the layers of vulnerability statistically, out of 35 States and Union Territories in the country, 27 of them are disaster prone. Almost 58.6 per cent of the landmass is prone to earthquakes of moderate to very high intensity; over 40 million hectares (12 per cent of land) are prone to floods and river erosion; of the 7,516 km long coastline, close to 5,700 km, is prone to cyclones and tsunamis; 68 per cent of the cultivable area is vulnerable to drought.

On account of its multilayered vulnerability, the country has witnessed an increase in the frequency and intensity of disasters in the past resulting in widespread devastation. This inference is drawn only on the basis of disasters which have been reported. 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. The provisional extent of damage in the country, as indicated by the Ministry of Home Affairs, is as follows:

Number of human lives lost	1432
No of cattle perished	6266
Houses damaged	6,84,901
Cropped area affected	16.28 lakh hectares

(Source: Ministry of Home Affairs, New Delhi)

The year 2011 started with a stampede in Kerala on **January 14** in which 102 Sabarimala pilgrims were killed at Uppupara on the Pullumedu-Vallakadavu forest route in Idukki district. The event took place when thousands of devotees were returning after holy darshan at the shrine of Lord Ayyappa on Makar Sankranti day. The two month long pilgrimage, which had started in November 2010, had been mostly incident-free before this mishap.

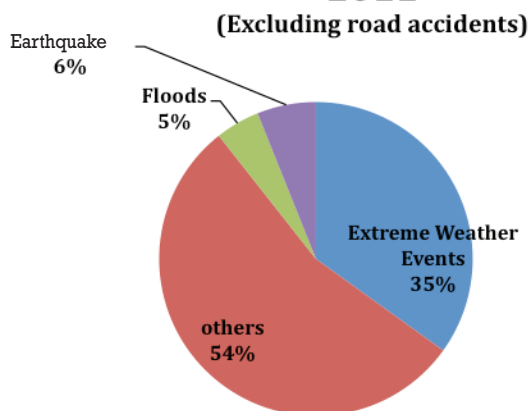
In **mid-September**, heavy monsoon rains resulted in widespread flooding in Odisha. Within two weeks, a second round of floods resulting from a tropical depression in the Bay of Bengal inundated 19 of Odisha's 30 districts. In response to heavy rainfall and to prevent breakage, authorities released water from the Rengali dam on the river Brahmani, exacerbating flooding in low-lying areas. Although the death toll was 45 in number, but the floods resulted in affecting over 3.5 million people and caused extensive damage to crops and infrastructure.

This was followed by 6.9 magnitude earthquake which hit Sikkim Nepal border region at 6.10 pm on September 18. It was widely felt in north-eastern states of India, West Bengal, Bihar, Uttar Pradesh, Haryana, Rajasthan including the capital city, Delhi. Subsequently, two more aftershocks of 6.1 and 5.3 at 6:21 pm and 6:42 pm respectively were also felt. The earthquake killed 60 people, affected 719 persons and caused substantial loss of livestock. The strong tremor caused significant building collapse and mudslides. As the earthquake occurred in the monsoon season, heavy rain and landslides added to the woes of the affected community and made the rescue work more difficult.

During the south west monsoon period from June to September, in September 2011 rainfall was the second worst event in south interior Karnataka since 1971, and in north interior Karnataka, third worst event since 1971. Failure of monsoon during September caused late

season drought of rare severity. The dry spell in interior Karnataka during September continued till October in many districts; 77 talukas recorded deficit rainfall during the period October 1st to October 14th. Ultimately Government of Karnataka declared 99 talukas as drought affected.

Disasterwise Distribution of Casualties, 2011

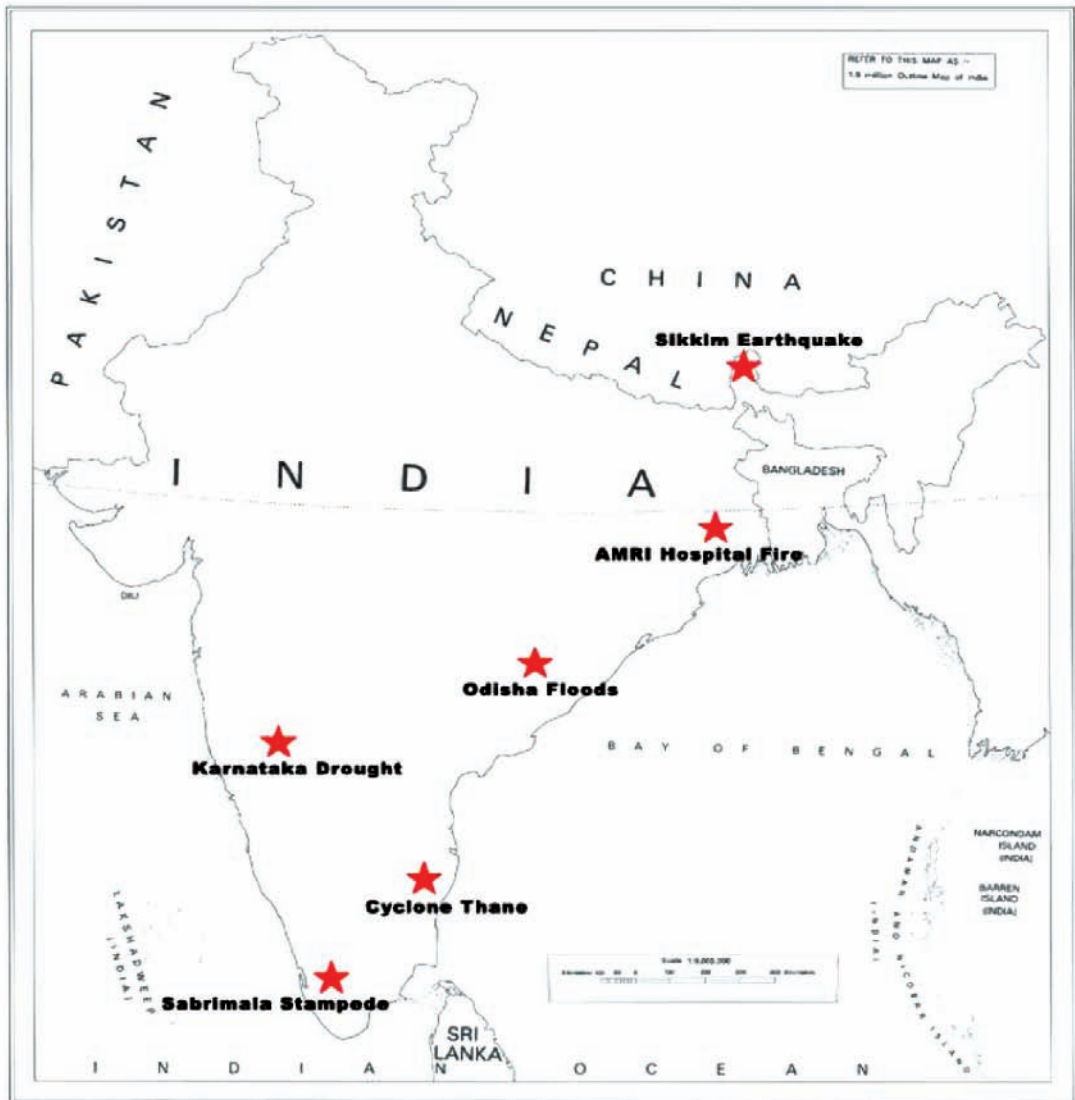


Though Andhra Pradesh declared 456 mandals spread over 15 districts as drought affected, yet no memorandum was submitted to Government of India. So this is covered as an important event in the Annexure (**Annexure-1**).

Towards the end of the year, a fire broke out in a AMRI hospital in Kolkata on **December 9**. The fire spread rapidly from the basement of the hospital, engulfing one ward after the other, trapping hundreds of people. About 91 patients, including three hospital staffers lost their lives. Many of the patients were rendered immobile and could not move out to safety and lost their lives subsequently. The privately owned hospital was accused of ignoring the basic safety laws and playing with lives of patients.

The year ended with a hydro-meteorological disaster in the form of a 'Cyclone Thane', which pummeled India's southeastern coastline. The cyclone hit Andhra Pradesh, Tamil Nadu and Puduchery. However, it took a decidedly southern turn as it made landfall, severely affecting the Tamil Nadu district of Cuddalore, south of the city of Chennai on **December 30** with winds gusting at almost 90 miles per hour at its peak. The cyclone resulted in death of over 53 people and caused severe damage to infrastructure and environment.

MAP SHOWING DISASTER EVENTS OF THE YEAR 2011
 (SOURCE OF BASE MAP : SURVEY OF INDIA, GOVT. OF INDIA)



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As we all know, in India, disaster management is essentially a state subject. However, when the state government is not able to meet the exigency, it can request the Central Government for assistance. In this report, we have discussed some major disasters for which the state

governments had requisitioned the Central Government for supplementary support. In addition, few disasters like the stampede in Sabarimala pilgrimage and fire breakout in hospital in Kolkata. have also discussed in detail due to the unique nature of these disaster events themselves and the large number of lives lost in the catastrophe. The list of disasters in which 10 or more human lives were lost is annexed at the end of the report. The list has been drawn from the daily disaster update compiled by the National Institute of Disaster Management for the reported disasters in 2011. The Ministry of Home affairs is the nodal agency for management of disasters in India. Their data has been extensively referred to for framing this document. Moreover, the source has been duly acknowledged wherever and whenever the relevant information has been presented in the India Disaster Report.

Odisha Floods

India is affected by floods in one or another part of the country every year resulting in loss of lives and property. The State of Odisha is located between 17° 48' N and 22° 35' N latitudes, and 81° 47' E and 87° 32' E longitudes. It extends over an area of 1,55,707 square km and is bounded by Bay of Bengal on the east (with coastline of about 480 km); Chhattisgarh on the west; Andhra Pradesh on the south and Jharkhand and West Bengal on the north (Fig.1) According to 2011 Census, the State has a total population (provisional) of 4,19,47,358; the rural population being 3,49,51,234. Mahanadi, Brahmani, Baitrani, Burhabalang, Subarnarekha, Rushikulya, Nagavali and Vamsadhara with their tributaries form the drainage system of Odisha. These rivers are perennial, maintaining a sluggish flow in the pre-monsoon period, but swelling menacingly with the onset of monsoon, often flooding large tracts.

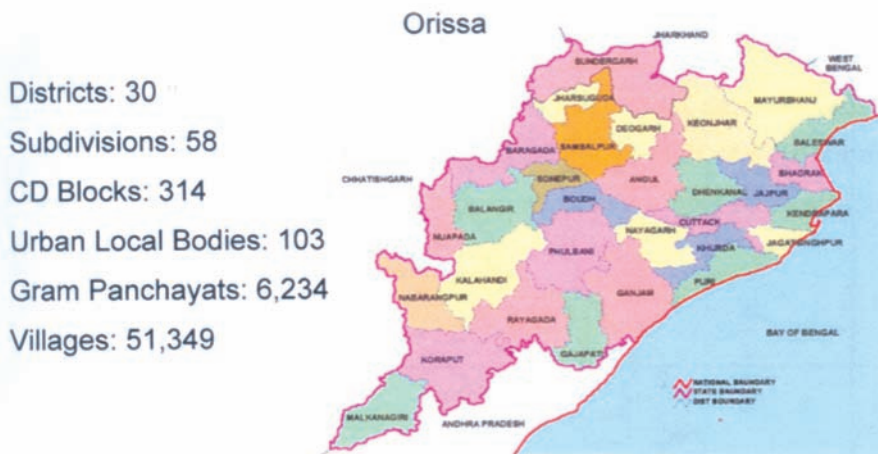


Fig. 1 Map showing district boundaries in the state of Odisha (Source: Memorandum of Govt. of Odisha)

FLOOD 2011

The flood of September 2011 in the Mahanadi river system was triggered by enormous precipitation in its upper catchment in Chhattisgarh. The inflow into the Hirakud reservoir was almost twice the full reservoir capacity and the outflow was to be balanced. The flood in river Mahanadi during September 2011 was a calamity of severe nature. The magnitude of the flood

and the severity of its impact are comparable to the high floods of 2001, 2003, 2006 and 2008. Massive devastation took place in the districts of Sambalpur, Baragarh, Subarnapur, Boudh, Angul, Nayagarh, Dhenkanal, Cuttack, Jagatsingpur, Kendrapara, Puri, Khurda and Jajpur. Normal life, livelihood and infrastructure were severely impacted due to severe flood situation.

Besides the flood in the Mahanadi system, the State experienced flood in two-three phases in river Subarnarekha, Budhabalanga and Baitarani between July and September 2011, affecting the districts of Balasore, Bhadrak, Kendrapara, Jajpur and Mayurbhanj. The flood affected districts have been delineated in the following map:(Fig.2) shown below

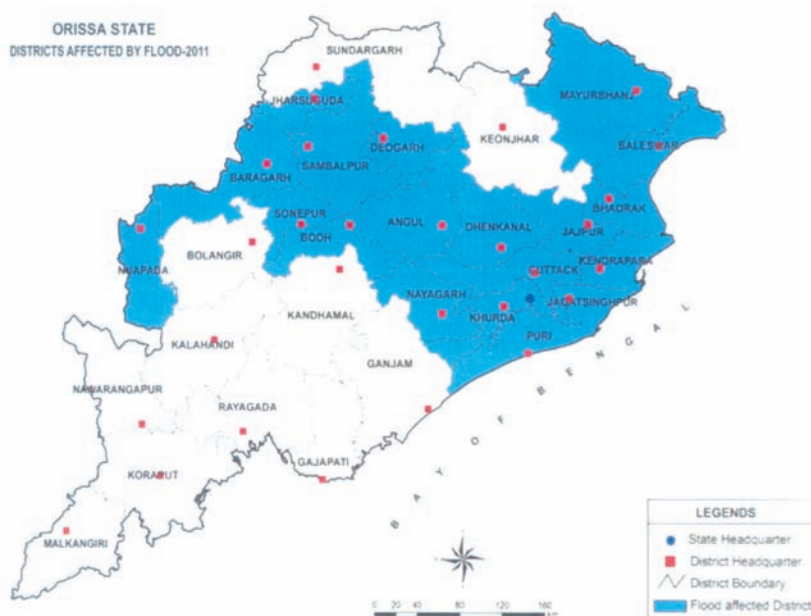


Fig.2. Map showing districts in Odisha, which are affected by Flood of 2011.

(Source: Memorandum of Govt. of Odisha)

Causes and Occurrence:

Heavy rainfall occurred for about 5 days from September 6, 2011 in the upper catchment of river Mahanadi, in the state of Chhattisgarh. From September 8, 2011, Hirakud reservoir started receiving more than 9 lakh cusecs of water and on September 9, 2011, the inflow in the reservoir dangerously exceeded 11 lakh cusecs. As the reservoir level steadily approached the full reservoir level (FRL) i.e 630 feet, commensurable flood water had to be discharged in

to the river Mahanadi. Added to this there was also heavy rain in the upper catchment of the tributaries of river Mahanadi, thus increasing the outflow from Hirakud reservoir. Due to heavy discharge of water the mighty Mahanadi created floods in delta areas. The peak flood discharge of Mundali i.e delta head was 13.67 lakh cusecs on September 11 2011.

Downstream flood water of Hirakud reservoir coupled with huge inflow from the neighbouring state of Chhattisgarh caused severe damages in Sambalpur, Bargarh, Boudh , Subarnapur, Nayagarh, Cuttack, Jagatsinghpur, Kenrapra, Jajpur, Puri and Khurda districts in the Mahanadi basin (Fig 2).

IMPACT



Figure.2: Submerged area in flood water (Source: Media)

Extensive damage was reported in 23 districts (Fig.2) due to floods in the year marked with loss of lives, damages to houses and affecting lakhs of people of these areas. The table below shows an abstract of the extent of damages.

Table-1: Abstract of extent of damages due to floods is indicated below (First Phase): (Source Memorandum of Govt. of Odisha)

Damages	September	June to August
No. of districts affected	19	4
Blocks affected	102	5
GPs affected	1067	33
Villages affected	4897	119
ULBs affected	21	1
Population affected (in lakh)	34.44	1.21
Human live cost	40	5
Houses damaged	116706	31

The flood in early September (First Phase) affected 102 blocks in 19 districts. The details of this impact are given in table - 2.

Table-2. September Floods, 2011 (First phase) (Source Memorandum of Govt. of Odisha)

Sl. No.	District	Blocks Affected	GPs Affected	Villages Affected	ULBs Affected	Population Affected	Human Casualty	House Damage
1.	Angul	2	12	49	1	15249		275
2.	Balasore	6	49	252	1	239253		34
3.	Baragarh	6	165	507		75000		2022
4.	Bhadrak	4	39	173		28000	2	30
5.	Boudh	3	22	122	1	57000		1779
6.	Cuttack	14	169	508	3	526923	1	14880
7.	Deogarh	3	44	123	1	25000		1350
8.	Dhenkanal	1	4	8		5018	2	16
9.	Jajpur	9	142	499		491114	13	8221
10.	Jagatsinghpur	7	16	126		87661		5585
11.	Jharsuguda	1	4	9	1	11679		357
12.	Kendrapada	9	116	473	2	507145	13	27000
13.	Khurda	6	48	236	1	161559	1	525
14.	Mayurbhanj	1	6	24	1	6887	3	148
15.	Nayagarh	3	15	110		73117		446
16.	Nuapada	2	28	322	1	17300		3464
17.	Puri	10	121	701	2	625897	2	38345
18.	Sambalpur	9	27	515	3	440000	3	6491
19.	Subarnapur	6	40	140	3	50187		5738
	Total	102	1067	4897	21	3443989	40	116706

Due to floods in June and August, 1.23 lakh people of four districts namely Balasore, Sambalpur, Keonjhar and Mayurbhanj were affected. The detailed figures of the damages of these floods are given in table -3.

Table-3 June & August Floods, 2011 (Detail) (Source Memorandum of Govt. of Odisha)

Sl. No.	District	Blocks Affected	GPs Affected	Villages Affected	ULBs Affected	Population Affected	Human Casualty	House Damage
1.	Balasore	4	31	114	-	121338	-	31
2.	Mayurbhanj	1	2	5	-	1400		
3.	Keonjhar (flash flood)	1	1	1	-	300	3	-
4.	Sambalpur (flash flood)	-	-	-	1	700	2	-
	Total		33	119	1	123738	5	31

The damage to the houses in the first phase of September, 2011 flood was extensive, weakening the capacity of the population and delaying the resilience. The details of the houses damaged are given in table - 4.

Table-4 House Damage (Detail) (Source: Memorandum of Govt. of Odisha)

Sl. No.	District	Fully damaged		Severely damaged		Partially damage	Huts damaged	Total
		Pucca	Kutchra	Pucca	Kutchra			
1.	Angul	00	62	00	00	213	00	275
2.	Balasore	00	2	00	5	24	3	34
3.	Baragarh	00	266	00	565	1191	00	2022
4.	Bhadrak	00	00	00	00	30	00	30
5.	Boudh	00	188	00	832	759	00	1779
6.	Cuttack	00	148	00	444	11777	2511	14880
7.	Deogarh	00	44	00	00	1306	00	1350
8.	Dhenkanal	00	00	00	00	16	00	16
9.	Jajpur	00	177	00	1113	5186	1745	8221
10.	Jagatsinghpur	00	171	20	968	2728	1698	5585
11.	Jharsuguda	00	131	00	68	142	16	357
12.	Kendrapada	35	1745	15	1985	18020	5200	27000
13.	Khurda	00	24	00	81	420	0	525
14.	Mayurbhanj	00	1	00	5	112	30	148
15.	Nayagarh	00	4	00	27	415	00	446
16.	Nuapada	00	32	00	276	3156	00	3464
17.	Puri	5	2893	87	5192	14937	15231	38345
18.	Sambalpur	2	446	00	914	4976	153	6491
19.	Subarnapur	00	1150	00	1400	2960	228	5738
	Total	42	7484	122	13875	68368	26815	116706

RESPONSE AND RELIEF MEASURES:

During the year about 179387.38 hectares of Kharif crop had sustained crop-loss, more than 50% due to floods. Agricultural land of 803.4 hectares had been sand cast, 14.67 lakh livestock were affected and 280320 people were evacuated to safer places and kept in temporary shelters during the floods. Evacuated people were provided with adequate quantities of dry food and cooked food through 542 free kitchen centres covering 280320 beneficiaries. For rescue and relief operations 1265 boats were pressed into action. The flood situation became grim from September 9-12. A large chunk of area was marooned. All ten units of ODRAF (Odisha Disaster Rapid Action Force) were deployed in Cuttack, Puri, Kendrapara, Jajpur and Jagatsinghpur districts for rescue and relief operation.

In view of the intensity of the high floods and devastation, emergent relief was sanctioned for a period of 7 to 15 days for the marooned people of the flood affected districts. Emergent relief in the form of rice, chuda and gud was distributed in the flood affected villages. In addition to dry food, candles, matchboxes, kerosene and other essential materials were also distributed. Children and infants in the marooned areas were provided with nutritious baby food for a period of 15 days as per CRF/SDRF norms. The helicopters of Indian Air Force and Indian Navy were requisitioned in order to facilitate the air-dropping of 23,272 food packets in the marooned areas of Kendrapara, Cuttack, Jagatsinghpur, Puri, Nayagarh and Boudh Districts. And also 1,21,256 families were provided with polythene sheets for temporary shelter, since their houses were damaged either fully or severely.(Fig.3)



Figure 3: Relief being distributed to the affected community (Source Media)

Health and Sanitation:

In order to prevent outbreak of epidemics, 135 medical teams were deployed in the flood affected districts and 482 Medical Relief Centres were opened to distribute 1,73,374 ORS packets and 52,74,613 Halogen tablets. Adequate arrangements were made for supply of safe drinking water in the flood affected areas with 600 water tankers and 3,600 mobile vans. 46,74,300 water pouches were also distributed in the affected areas.

Disinfection of drinking water sources was carried out in tube wells, public water supply system restored and bleaching powder was distributed in bags to utilise at each households. The disinfection of these hand pumps was carried out to prevent water borne diseases. Affected animals were shifted to safer places and 349 veterinary teams were deployed in the flood affected areas. Arrangements were made to vaccinate 5.39 lakh livestock and 19220.41 MT of cattle feed of high quality was distributed among 12, 87,200 livestock in 4499 cattle camps.



Figure 4: Children drinking water from hand pump submerged in flood water (Source: Media)

Second phase of flood in September, 2011

Further as a result of depression over northwest Bay of Bengal, off North Odisha and West Bengal Coasts, there was heavy to very heavy rains on September 22 - 23 over Brahmani, Baitrani, Budhabalang and Subarnarekha basins which caused major damages in districts affecting 71 blocks, 890 Gram Panchayats and a population of 25,32,313 with 42 persons dead. (Additional Memorandum submitted by Govt. of Odisha).

WAY FORWARD

As the floods are becoming an annual feature, the government needs to gear up the system by training the community to live with it and make them more resilient and ensure that their livelihood is affected to the minimum and they spring back to normalcy as early as possible. All the governmental programmes may be planned with this objective. The cattle population affected by floods also affects the livelihood of the farmers, who are dependent on their health. Some NGOs have taken care of animals as reported in the media, however there is a need to plan a strategy about their well being during such natural hazards and maintain their wellbeing by assisting the farmers or training them to take care of them during disaster situation.

References:

1. Memorandum: Floods 2011 Relief Commissioner, Revenue and Disaster Management Department, Govt. of Odisha, 2011.
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3. Hydro geological Atlas of Orissa, Central Ground Water Board, Ministry of Water Resources, South-Eastern Region, Government of India, 1985 .

Sikkim Earthquake

OVERVIEW

Sikkim is a mountainous state which is crisscrossed by narrow valleys and steep cliffs. It has a fragile ecology being the steepest and the highest state in India, and the third highest landscape globally. It is located in the highest seismic zone and has weak geological formations, comprising of sedimentary and low grade metamorphic rocks which are prone to landslides. The State also experiences heavy monsoons with an average rainfall to the tune of 2800 mm. Cupped in the lap of eastern Himalaya, the north eastern State of Sikkim falls in high seismic zone (Zone V). The region has experienced relatively moderate seismicity in the past, with 18 earthquakes of Magnitude 5 or greater over the past 35 years within 100 kilometres of the epicentre of September 18 event. The largest of them was of Magnitude 6.1 in November, 1980. The last significant earthquake in the region occurred in February, 2006 measuring 5.3 on Richter scale.

An earthquake measuring 6.8 on Richter scale occurred on September 18, 2011 at 18:10 hours in the Sikkim Nepal border region. The epicentre of the earthquake (27.7oN, 88.2oE) was located near the Sikkim-Nepal border, about 68 km northwest of Gangtok, Sikkim at a shallow depth of about 19.7 km. The earthquake caused strong shaking in many areas adjacent to its epicentre lasting for about 30-40 seconds. It was widely felt in all North Eastern states of India, West Bengal, Bihar, Uttar Pradesh, Haryana, Rajasthan including capital city Delhi. The Indian Meteorology Department recorded two aftershocks of M 5.7 and M5.1 within two hours and another of M 4.6 at 3:21 am on 19th September, 2011. The earthquake claimed 60 lives in Sikkim, including 16 at the Teesta Stage III hydroelectric power project site and injured 719 persons and caused extensive damage. The devastation caused by the earthquake was intensified by seasonal heavy monsoon rains that caused landslides, mud slides and also caused floods that destroyed thousands of homes, buildings and infrastructure. More than 300 landslides occurred all over the state and disturbed the road connectivity to major towns like Mangan, Chungthang, and Lachung and even NH31A, main route connecting Sikkim and West Bengal. It was followed by road blocks, falling boulders, lake bursts and flash floods with incessant rain which continued for over a week after the earthquake.



Map showing the Earthquake Epicentre and Affected Areas

At its location, the continental Indian and Eurasian Plates converge with one another along a tectonic boundary beneath the mountainous region of northeast India near the Nepalese border. Although earthquakes in this region are usually interplate in nature, preliminary data suggests the Sikkim earthquake was triggered by shallow strike-slip faulting from an intraplate source within the over-riding Eurasian Plate. Initial analyses also indicate a complex origin, with the perceived tremor likely being a result of two separate events occurring close together in time at similar focal depths.

IMPACT

The north district of Sikkim, which mostly comprises of the tribal population was the closest to the epicentre and was badly hit. Extensive damage and loss of public infrastructure was reported in the following sectors all over the State:

1. *Transportation infrastructure* comprising of roads and highway networks, bridges, tunnels, culverts, retaining walls and village footpaths.
2. *Energy infrastructure* in the form of generation plants, electrical grid, substations and transformers
3. *Water management infrastructure* comprising of drinking water supply, drainage systems, irrigation systems and flood control systems.
4. *Governance infrastructure* of government offices at the village, block, district and state level, military infrastructure along with residential buildings.

5. *Social infrastructure* including the health care system, education and research system and social welfare system primarily ICDS.
7. *Economic infrastructure* comprising of marketing hubs, manufacturing centers, agriculture, horticulture, animal husbandry, forestry and fisheries infrastructure.
8. *Recreation infrastructure* like community halls, playgrounds, sports complexes etc.
9. *Cultural heritage infrastructure* like historic monasteries, chortens shedas (monastic schools), archaeological sites, temples, churches etc.



Damage caused to various buildings in the Sikkim earthquake

The loss and damage from the Earthquake is depicted in the following table

Loss and Damage	Number
Human Lives lost	60
Injured	710
Houses	34159
Government Buildings	1255
Cattle Lost	525
Sheep, Goats, Pigs lost	808
Agriculture crops	7500 Hectares
Roads Damaged	3230kms
Village footpaths	1596
Bridges/Culverts	8135
Water Supply schemes	1529
Minor Irrigation Works	204
Flood Control Management works	533
Power Infrastructure	Major Damage

Schools	759
Hospitals	377
ICDS (Anganwadi)	875
Historic Monuments, Monasteries and Religious Institutions	259
Gram Panchayat Offices	60
Village level co-operatives	49
Rural product Marketing Centres	8

(Source: Memorandum submitted by Government of Sikkim)

The State estimated a loss to the tune of Rs 7425 crore and sought a relief from Rs 6890 crore.

RESPONSE

Heavy rain, fog and blocked roads prevented the rapid deployment of rescue workers in the initial phase of the earthquake response. Rescue teams experienced difficulties in accessing some of the remote worst affected areas in northern Sikkim State and in the eastern region of Nepal that borders the State. As heavy rains eased on 22 September, relief teams reached the worst affected areas in northern Sikkim State by Indian Air Force's (AIF) helicopters. Massive operations were launched to rescue the injured and trapped population from the buildings and houses by the state administration along with the army, ITBP, SSB, NDRF, central government and state agencies.



Army and Indo-Tibetan Border Police personnel use earthmoving equipment to clear the road at Bitu village, Sikkim on Tuesday.



Army jawans distributing food to the earthquake survivors after they were rescued from Chungthang in North Sikkim about 110 km from Gangtok

About 103 relief camps were made operational in the entire four districts and 14360 members of the affected community were accommodated and provided with food, clothing and medical care. The relief camps were set up in almost every gram panchayat units. The State government declared an ex gratia payment of Rs 5 lakh each to the next of kin of the deceased while the central government announced an ex gratia payment of Rs 2 lakh. The central government also gave Rs 1 lakh for the injured persons while the state government gave Rs 50,000/- to the families of each injured person.

REHABILITATION AND RECOVERY

Several steps were taken at the central and state level to rehabilitate the affected community and to “build back better”. The central and the state government worked together towards reconstruction and rehabilitation in such a way so as to mitigate any such future disaster. The Prime Minister Shri Manmohan Singh announced an assistance of Rs.1, 000 crore to the State of Sikkim to meet the requirements of relief and rehabilitation in the wake of the massive destruction caused by the earthquake. The central government assured the Sikkim government of “every possible assistance” to manage effectively the task of reconstruction, rehabilitation and re-development”. The Sikkim government was also advised to learn from its experience by using proper building technology and building by-laws so as to be better prepared in the event of recurrences of earthquakes. An expert’s team on earthquake-resistant technology was sent by the Centre to assist the State in rebuilding its infrastructure and to make Sikkim a model State in earthquake mitigation and to show the way to other earthquake-prone States in the country.

The Ministry of Power had also asked the National Hydro Power Corporation (NHPC) to extend all possible assistance to State Government of Sikkim to bring normalcy to the earthquake affected areas near NHPC’s Teesta Hydrel Power Station and Rangit Hydrel Power Station in the State. It was decided to avail the services of seismic experts from IIT Roorkee to analyse the earthquake data and conduct the earthquake impact study at the dam sites of NHPC in the region and more specifically those in Sikkim.

Apart from this, an Expert Team of Geologists, Engineers and senior executives of NHPC from its Headquarters in Delhi were also asked to visit the site and submit report to the authorities. Power Supply position in Gangtok was also reviewed and Power Grid Corporation was instructed to expedite restoration of power. North Eastern Electric Power Corporation (NEEPCO) was also asked to compile the seismic data collected from its power stations in North Eastern States for further analysis at Indian Institute of Technology, Roorkee.

Documentation & Workshop by NIDM

National Institute of Disaster Management (NIDM) deputed Dr. Chandan Ghosh, Professor and Head and Dr Surya Parkash, Associate Professor, Geohazards Division to document the Mw6.8 Sikkim Earthquake that struck on Sunday, 18 September 2011, at 18:10:48 hrs (IST). The team carried reconnaissance survey of the affected areas from 21 to 25 September 2011 and held interactions with officials from the State and Central Government Agencies, armed forces, communities, NGOs and civil societies involved in the relief and rescue operations. The team mainly noted the extent of damages incurred to buildings, roads and infrastructures; response mechanism and relief measures being adopted, emergency control room operation at the district head quarters, in addition to media and press briefing to tackle the situation on emergent basis.

The documentation was followed by one day workshop on Feb 9, 2012 to ensure pulling together information into a single, consolidated report detailing information on the physical impacts of the earthquake event, the economic value of the infrastructure and social damages, physical and economical losses, the human impacts as experienced by affected populations, and related early and long-term recovery needs and priorities. The workshop was attended by 50 delegates and speakers who had visited the earthquake affected sites. The aim of the workshop was to bring all professionals having direct exposure of working in the earthquake affected region and policy makers on one platform, so that lessons learnt from Sikkim earthquake are discussed and documented. The outcome is expected to facilitate in managing future disasters more effectively.

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Karnataka Drought

OVERVIEW

Karnataka covers an area of 1,91,976 sq km and comprises humid, sub-humid, semi-arid and arid climatological regions. The population of the State is 6.11 crores, out of which 66% are rural based and dependent on agriculture. Two thirds of the geographical area falls under semi-arid to arid conditions. Nearly 76% of the sown area is under rain fed agriculture and is vulnerable to the vagaries of the monsoon.

The Karnataka has experienced drought during the years 2001, 2002, 2003 and 2004 consecutively. During the year 2005, state was under heavy floods. During 2006, it experienced both flood and drought situations. During 2007, it repeatedly faced floods 4 times. For the years 2008 and 2009, there were both drought and flood in the State. During the year 2011 the monsoon started in time and all parts of the State, except Karavali and Malnad regions, experienced moderate rain during September 2011.

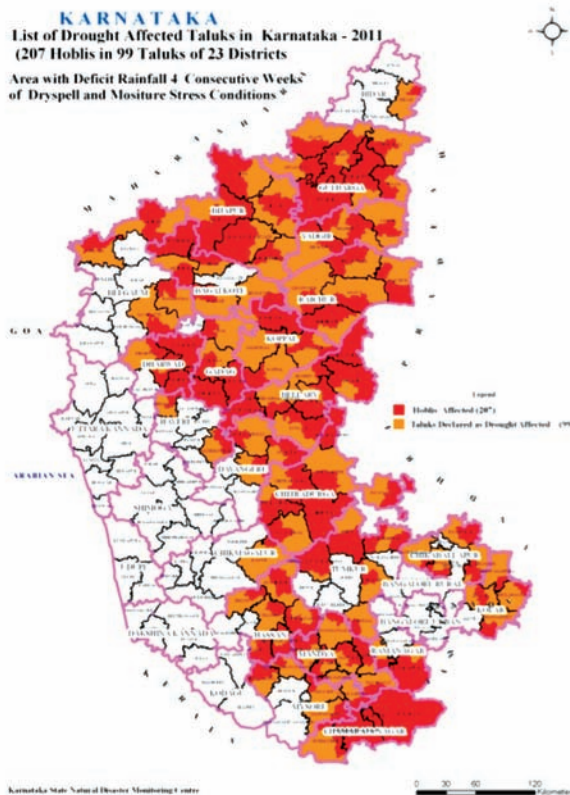
Rainfall during south west monsoon - 2011

During May-2011, the state as a whole recorded, 71.7 mm rainfall as against its normal rainfall of 85.2 mm, with departure from normal being (-) 16%. Out of 176 talukas in the State, 79 recorded deficit / scanty rainfall. The onset of monsoon over the southern part of State was on June 2nd and was on time. The progress of the monsoon trend was normal and covered most part of the State by June 10th, except parts of Bidar, Gulbarga, Yadgir and Raichur districts. Monsoon covered the entire state by June 15th. During June-2011 the State as a whole received actual rainfall of 200 mm as against its normal rainfall of 183 mm with (+) 10 % departure from normal. The interior parts of Karnataka received below normal rainfall but the rainfall was normal to excess in the districts of Malnad and coastal regions. During June rainfall was deficit in 58 talukas. During July, the state as a whole recorded 234 mm rainfall as against its normal rainfall of 266 mm with departure from normal being (-) 12 %. The districts of Chitradurga, Davanagere, Chamarajanagara, Mysore, Belgaum, Haveri, Dharwad, Hassan and Chikmangalur recorded deficit rainfall. However, during the month 72 talukas recorded deficit /scanty rainfall. The coastal, Malnad and South interior Karnataka regions recorded below normal rainfall. During August, the State received 230 mm rain as against normal rainfall of 196 mm with departure from normal of 17%. The rainfall was deficit during the month in the districts of Chitradurga and Bellary. The discussion indicates that the rainfall was more or less normal from May-August, 2011.

During September, the State witnessed scanty rainfall in 17 districts of interior Karnataka with departure from normal up to (-) 81%. The coastal and Malnad region received excess rainfall during the month. South interior Karnataka recorded only 44 mm rain during the month as against the normal rainfall of 134 mm. The North interior Karnataka region received 57 mm rainfall as against normal rainfall of 152 mm. **September 2011 rainfall was the second worst event in South Interior Karnataka since 1971, and in North Interior Karnataka, third worst event since 1971. Failure of Monsoon during September 2011 caused late season drought of rare severity.** The dry spell in interior Karnataka during September 2011 continued to October 2011 in many districts. 77 talukas recorded deficit rainfall during the period October 1-14 2011.(Fig.1)

Though the cumulative rainfall departure from normal for the State as a whole during June 1-14, 2011 was (-) 4% from normal, failure of monsoon during September and October resulted in late season drought.(Fig.2 & 3)

(Fig.1)



(Soure : Memorandum, Government of karnataka)

Key drought Indicators during Kharif 2011:

The dry spell during the crop growth period causes agricultural drought. Agricultural drought occurs when soil moisture and rainfall are inadequate during the crop growing period causing extreme moisture stress and wilting. It thus arises from variable susceptibility of crops during different stages of crop development, from emergence to maturity. It is defined as a period of 4 consecutive weeks with a rainfall deficiency of more than 50 % of the long term average from mid-May to mid-October

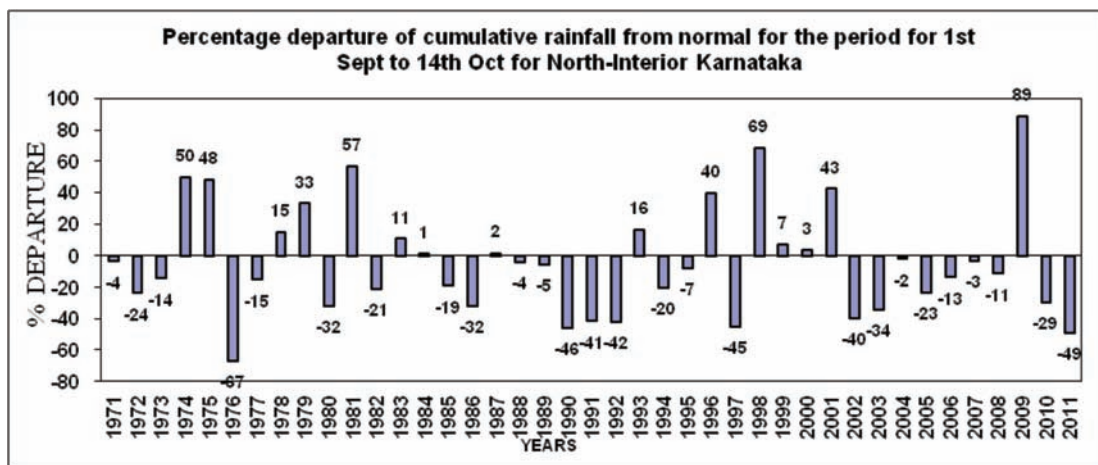
Drought Monitoring:

Karnataka has established institutional mechanism to monitor the drought indicators by setting up Drought Monitoring Cell way back in 1988. GPRS enabled Telemetric rain gauges have been installed and operational in all the 747 hoblis (villages) and 770 gram panchayats. GPRS enabled weather stations have been installed at 135 sites. Karnataka State Natural Disaster Monitoring Centre has taken a lead in monitoring the recurring drought situation on a scientific basis. The centre has made operational for various programmes on knowledge management and decision support system.

Moisture Adequacy Index:

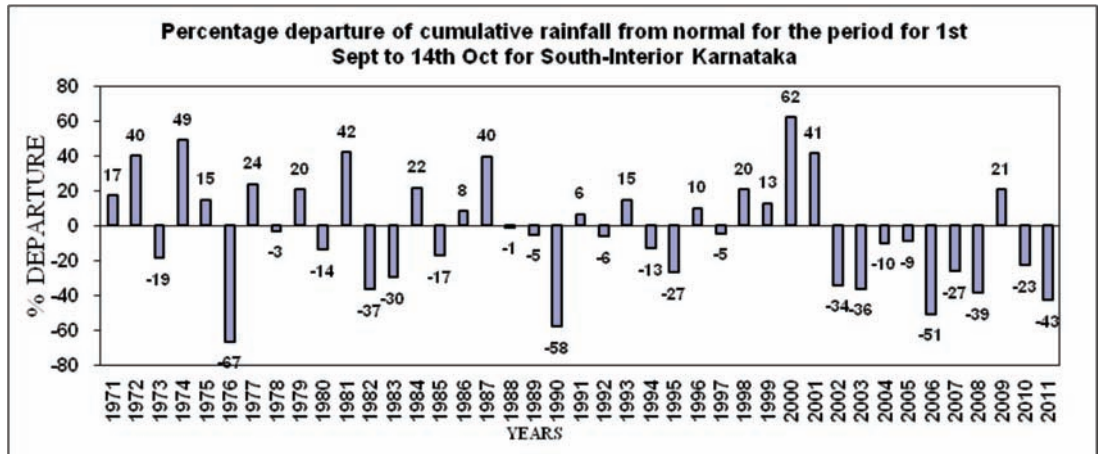
Karnataka State Natural Disaster Monitoring Centre (KSNDMC) has developed moisture adequacy index based on rainfall, potential evapotranspiration, actual evapotranspiration, soil moisture condition, available water capacity of the soil and using soil water budgeting. Moisture adequacy index are classified into severe moisture stress (MAI < 25%), moderate moisture stress (MAI - 25.1 to 50%), agriculturally favorable (MAI - 50.1 to 75%) and Humid region (MAI >75%).

Fig.2



(Source : Memorandum, Government of Karnataka)

Fig.3



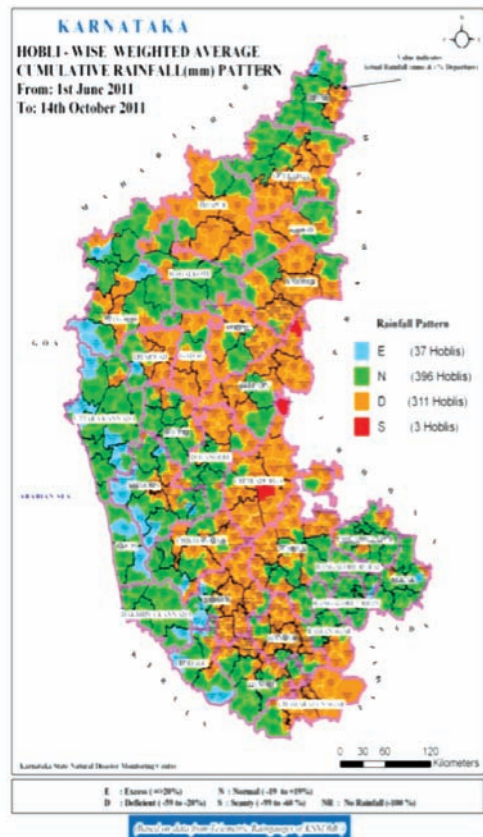
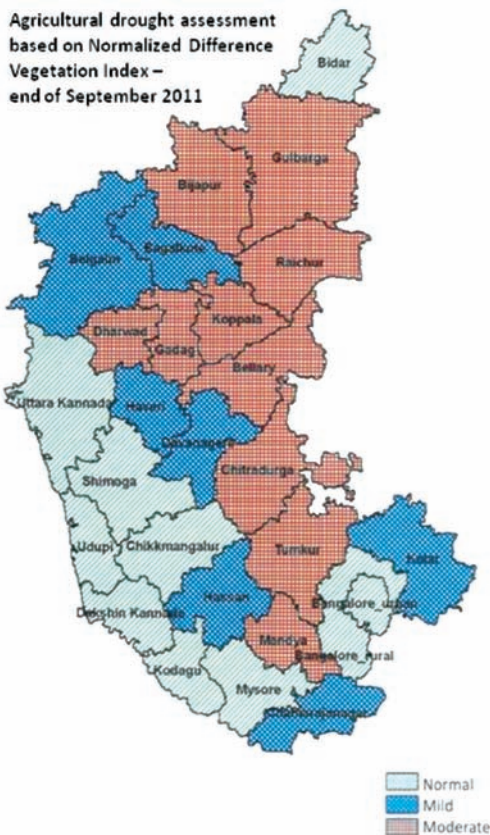
(Source : Memorandum, Government of Karnataka)

As on end of September 2011, 27% of the geographical area in the State was under moderate/severe moisture stress covering interior regions of the state. This indicator has assessed the moisture stress experienced by agriculture/ horticulture crops.

Normalized Difference Vegetation Index:

Assessment of agricultural drought and crop condition was carried out during Kharif 2011 by the State in association with National Remote Sensing Centre, Government of India. The report at the end of September has indicated drought condition prevailing in 20 districts of the Karnataka (Fig.4). It is also to be noted that out of 22 districts in the country under "Moderate drought", Karnataka had 11 districts under the category, which accounts to 50% of the total area in the country. Similarly out of the 49 districts in the country under "Mild drought", Karnataka has 11 districts falling under the said category constituting 22% of the total area of the country. Hence NDVI indicator had identified the drought situation in the State (Fig.4). Along with the above mentioned indicators, deficit rain, dry spell, moisture stress pattern were also vital indicators of drought.

Fig.4



(Source : Memorandum, Government of Karnataka)

DECLARATION OF DROUGHT:

As per the recommendations of Cabinet Sub Committee in 2004, area with a continuous dry spell for more than 4 weeks period may be considered for declaring as drought affected.

For declaring drought the following parameters were considered.

- 1) Continuous dry spell of 4 weeks or more.
- 2) Percentage departure of rain (-) 20% or more.

South West Monsoon drives the Kharif agricultural activities in the state of Karnataka. Generally September 30 2011 is the normal withdrawal of South West Monsoon in the state. Taking into consideration the drought indicators, deficit rain, dry spell/moisture stress prevailed in 70

talukas of the state and thus they were declared as drought affected on October 4 2011 and 14 talukas were declared as drought affected on October 7. The situation was again reviewed on October 15 and 6 more talukas were declared as drought affected. With no respite in the situation, 9 more talukas were declared as drought affected on November 8. Thus in all 99 talukas were declared as drought affected in the State.(Fig.1)

IMPACT

The severe drought condition adversely affected not only agriculture, but other sectors like horticulture, livestock, etc. The summary of loss due to Drought during 2011, as per the memorandum submitted by Government of Karnataka, is presented in the table.1 below:

Table.1 : Summary of Loss due to Drought during 2011

Sl. No.	Item	Estimated loss	Relief claimed as per CRF Norms in crores
1	Agriculture Crop loss	4245.84	202.54
2	Horticulture Crop loss	299.00	13.94
3	Animal Husbandry		
	a) Opening of Goshalas		23.92
	b) Purchase of Fodder mini kits		4.20
	c) Purchase of Fodder Banks		7.60
	d) Nutrient supply and Vety care		4.20
	Total of Sl No 3		39.92
4	RDPR Dept		
	a) Revival of PWS		24.42
	b) Revival of MWS		24.52
	c) Retrieval / hydro fracturing of bore-wells		18.23
	d) Drilling of new bore-wells		18.24
	e) Transportation of water		36.63
	Total of Sl. No. 4		122.04
5	Additional funds under MGNREGS		4.80
6	Additional funds under Health Sector		10.00
7	Additional funds under Power Sector		330.00
	Grand Total of Sl. No. 1 to 6	4544.84	723.24

(Source: Memorandum, Government of Karnataka)

FOLLOW UP ACTION TAKEN:

The Government of Karnataka has been reviewing periodically the seasonal conditions of

Agriculture crops at State / district levels. Agriculture Department was conducting periodic review of status of agriculture. Department was also in constant touch with taluka and District officials through weekly video conference to review the crop conditions. Contingent action plan was prepared by scientists of agriculture university and was executed in the affected districts. Nodal-officers were appointed in all the districts to review the seasonal crop conditions. "Bho-Chetana" scheme was extended to all the districts during the year. The scheme focuses on retaining / increasing soil fertility and micro nutrients of agriculture land and increase crop production. About 23 lakh farmers were covered under this scheme in the whole state. Seeds and fertilizer requirements in the districts were monitored constantly. Steps were taken to distribute seeds at subsidized rates for alternate crops. Close watch on Crop cutting experiments and special attention was paid to ensure none of the experiments will lapse. Micro and Macro irrigation programmes continued to cover more land under irrigation for less utilization of ground water. Scientists from university of agriculture, horticulture and fisheries were closely monitoring the seasonal conditions and advising farmers to improve crop conditions.

The villages, which were facing / likely to face shortage of drinking water, were identified and contingent action plan was prepared and implemented to tackle the issue. This mainly included - constant monitoring for effective implementation of on-going drinking water schemes, quick implementation of works approved during 2011-12, and repair and rejuvenation works, emergency supply of drinking water through tankers, purchase of more motor-pumps, extension of pipelines, effective implementation of flushing, deepening and hydro-fracturing works, functioning of control rooms at taluka level, drilling of bore-wells, steps to ensure effective supply of clean drinking water through tankers, etc.

MGNREGS is one of the flagship programmes being implemented in all the districts of Karnataka. For the livelihood of rural people, who are poorest among the poor, are required to be provided employment in order to avoid migration. In order to combat the drought situation effectively, all the implementing officers were instructed to gear up the administrative machinery for providing employment to the people, by implementing the employment generation works, especially in the drought affected talukas.

Further, circulars and guidelines have been issued to set-up goshalas, fodder banks, veterinary care centres, funds were released to the districts to purchase fodder mini kits to grow adequate green fodder in the affected areas. Health packages, including necessary medicines, vaccination, etc. were supplied to the affected districts for health-care of the cattle.

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Sabarimala Stampede

OVERVIEW

A stampede is a sudden rush of a congregated, active or polarized aggregate of people, resulting in many injuries and death from suffocation and trampling. The two major behavioural reasons of any stampede are anxiety and panic. It has been claimed that most of the stampede disasters can be prevented by simple crowd management strategies.

The famous Sabarimala Sree Dharma Sastha Temple, dedicated to Lord Ayyappa, is situated on a hilltop (about 3000 feet above sea level), named Sabarimala in Pathanamthitta district of Kerala State. The uniqueness of the temple lies in the fact that it is open to all, irrespective of caste, creed or religion. However, the female between the age of 12 and 50 years are not allowed in the temple. It is open for worship only during the days of Mandalapooja, Makaravilakku and Chitra Vishu. The temple attracts pilgrims not only from the southern states of Kerala, Tamil Nadu, Karnataka and Andhra Pradesh, but also from other parts of the country and abroad. It is said that the pilgrims have to follow fasting for 41 days to cleanse their minds before going to Sabarimala. The journey to the temple is to be taken through difficult paths in the forest as the vehicles can go only up to Pamba. To enter the Sabarimala temple, the pilgrim has to pass Pathinettampadi (holy eighteen steps).



Pilgrims gathering in sabarimala for worship makarajyothi (Source: The times of india)



Policeman inspects the site of stampede (source: The Time of india)

On January 14, a large number of pilgrims gathered to attend the Makarjyothi darshan, on the last day of a yearly festival which attracts millions of devotees, at a Hindu shrine in Pamba. After witnessing the Makarajyothi at Pamba, the pilgrims were returning and on way back around 8 p.m. the incident happened, killing 102 pilgrims and injuring at least 100 more.



Bereaved woman is consoled by her relatives
(Source: The Times of India)

The preliminary report submitted by Idukki District Collector on Sabarimala stampede suggests that the tragedy occurred when an auto and jeep overturned. Both the vehicles were filled with the devotees. Initially, the fully packed auto overturned after it lost control. While the pilgrims were trying to lift the auto, the jeep overturned, triggering the stampede. The autopsy report also suggested that most of the pilgrims had died of injury to their internal organs due to the stampede at Pulmedu.

RELIEF EFFORTS

Hon'ble Shri V. S. Achuthanandan, the then Chief Minister of Kerala, announced a judicial inquiry into the stampede that claimed the lives of 104 Sabarimala pilgrims. He also announced a solatium of Rs five lakh for the families of each of the victims. The seriously injured would be given Rs



An injured pilgrim being carried into an ambulance
(Source: nimma Begaluru weekly newspaper)

50,000 and those with minor injuries Rs 25,000 each. It was announced that the government



Medical treatment being to survivors
(Source: nimma Begaluru weekly newspaper)

would meet the flight and road transport expenses for ferrying the bodies of victims to their home towns. He also reviewed with cabinet colleagues on the spot arrangements to transport the bodies, as most of the deceased were from neighbouring states of Tamil Nadu, Karnataka and Andhra Pradesh.

Kerala declared three days of mourning, as the toll in the stampede near the state's famed Sabarimala temple climbed to 104 with more bodies being brought to hospitals.

Hon'ble Prime Minister of India, Dr. Manmohan Singh, offered condolences for the deaths and announced a compensation of 100,000 to the next of kin of the dead and 50,000 for those injured. A team of National Disaster Response Force (NDRF) was sent to the site of the tragedy to carry out rescue operations. The then Chief Minister of Tamil Nadu, Shri M. Karunanidhi, announced 1,00,000 to the family of each victim on behalf of Tamil Nadu Government. Meanwhile, Union Finance Minister Shri Pranab Mukherjee and Defence Minister Shri A. K.

Antony cancelled their engagements in Kerala in view of the tragedy.

RECOVERY MEASURES

Stunned and jolted by the Sabarimala tragedy, cautious Kerala Government came up with a new footpath, a bridge and a slew of measures to decongest the route leading to the Sabarimala temple. Retired High Court Judge Shri M. R. Hariharan Nair, was appointed for enquiring into the Pulmedu tragedy in Sabarimala and to submit the report to State Government. Earlier, Shri Nair had submitted an interim report to Hon'ble Chief Minister of Kerala, Shri Oommen Chandy, recommending measures to prevent such accidents in future during the pilgrim season.

Public Works Minister, Shri V. K. Ebrahim Kunju, who was discussing the interim report of Pullumedu tragedy, submitted by Justice Shri Hariharan, stated that the repair works of damaged roads to Sabarimala would be completed before the start of next season. 63.5 crores were sanctioned for this task. The report, which was submitted by Justice Shri Hariharan had been accepted by the State Government for follow-up actions.

On the recommendations of the Commission's report, following decisions had been taken to ensure safety of pilgrims:

- To ban private vehicles in the Vandiperiyar- Vallakadavu route.
- To introduce KSRTC chain service on the Vandiperiyar- Vallakadavu route.
- To construct two queue complexes and a bailey bridge at Sannidhanam before the commencement of next season.
- To provide better sanitation facilities from Pampa to Sannidhanam. For this task 5 crores allotted in the budget would be utilized.
- To organise a meeting with Devasom Secretaries of Andhra, Tamil Nadu, Punducherry and Karnataka at Kottayam, to discuss the preparations for the next season.
- To open an Information Centre at Nilakkal for the pilgrims from North India.

It has also been decided that an integrated security and safety plan involving police, rapid action force and disaster management contingents would be put in place during the two-month long pilgrimage season of Sabarimala Ayyappa temple. The security system being evolved had factored in the recommendations in the interim report of the judicial commission that probed the Pulmedu stampede tragedy. Besides Kerala Police and its various specially trained units, services of police from the neighbouring states would also be utilised as part of the comprehensive safety plan. Apart from strengthening intelligence gathering, trained

commandos, bomb detection squads, disaster management units and RAF contingents would be deployed at the base camp Pampa, "Sannidhanam" atop the hill shrine and other places connected with the event.

In view of the Pulmedu tragedy, vehicular traffic along the Uppupara route had been banned. Security in the trekking route, used mainly by devotees from Tamil Nadu, would be stepped up and other facilities like lighting would be improved. The Travancore Devaswom Board, administering the shrine, was also considering bringing more routes under the coverage of accident insurance scheme. A high-level meeting held in Kottayam had decided to form a joint council of five southern states for inter-state co-ordination of the pilgrimage, which attracts over 30 million devotees a year, mostly from Tamil Nadu, Andhra Pradesh and Karnataka.

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AMRI Hospital Fire

OVERVIEW

Health systems rely on a range of public, private and non-governmental health facilities to work together to serve the community. The importance of hospitals and all types of health facilities extend beyond the direct life-saving role they play (ISDR, 2008-09). These facilities are not only the lifelines of the communities but also the powerful symbols of social progress and a prerequisite for stability and economic development. Therefore, special attention must be given to their robust physical and functional integrity in emergency conditions. However, globally there are countless examples of health infrastructures — from sophisticated hospitals to small but vital health centres — that have not been operational and sustained loss of lives and infrastructure, not only during disasters but have themselves inflicted disasters on the community due to its own vulnerability. Failure of hospitals and emergency services during a disaster can greatly affect public morale and a community's social and health capital, but, nothing can be more traumatic when hospitals themselves become disasters by failing to provide safety to its users. It is unethical to allow scope for a place meant to save lives to turn into a death trap.

As we know very well that many new hospitals are propping up in India, catering to a growing middle class and even some foreigners are looking for inexpensive and quality care. While India is gaining a good reputation for its medical talent, the construction codes and public safety regulations are lagging behind. There is a serious need to look into building safety codes and plan for fire while issuing the licenses for running the hospitals. In addition to the lapses in building, codes and fire exit strategies, the widespread corruption often makes it possible for code violations to be overlooked.

This year witnessed a major fire accident in AMRI Hospital, which is located in a posh area of Kolkata. AMRI Hospitals was co-founded by Emami & Shrachi Groups in 1996, two of Kolkata's developing groups, along with Government of West Bengal to expand health coverage options for consumers. The Emami Group has varied interests comprising personal and health care, hospital, bio-diesel, real estate, ball pen tips and retail, while the Shrachi Group has varied interests comprising Agro machinery, Engineering, Real Estate, Health Care, Finance Securities and information technology. AMRI hospital is a center for training the student of Institute of Radiology & Medical Imaging and is ISO 9001:2000 certified. It is a multi-storied private hospital which turned into a towering inferno in the early hours of the morning, when a fire

broke out in the hospital in Kolkata on December 9, 2011. The fire spread fast from the basement of the hospital, engulfing one ward after the other and trapping hundreds of people.

IMPACT AND RESPONSE

The fire was first noticed by local residents at around 3.30 am, who rushed to the gates but were stopped by security guards. The hospital authorities reported to the fire stations after an hour or so. Firemen, who reached at 4.30am, broke through the double-paned glass façade of the hospital and rescued a few lucky survivors. Around 25 fire engines were rushed to the spot. The fire fighters were seen using hydraulic ladders to rescue the patients and office staff by cutting opens the glasses with gas cutters. Many patients were lowered down from the upper floors in safety harnesses attached to ropes; others were wheeled out on stretchers. But by then, it was too late for a majority of the 150 patients admitted at AMRI.

Though the cause of the fire has not yet been ascertained, Gopal Bhattacharjee, Director of the fire department, opined that it was most likely to be the result of an electrical short circuit in the basement car park, which was being used illegally as a store for combustible material like LPG cylinders, engine oil, PVC pipes, bedding, etc. The hospital authorities had been asked by the Kolkata Police to vacate the store in July. The fire didn't spread at all and was confined to the basement. But the thick black smoke went up through the AC ducts and carried it through the rooms and corridors of the seven-storeyed hospital located in a densely-



fire engulfs the AMRI hospital in Kolkata



Patients being rescued by fire personnel

populated area.

The devastating fire killed 91 patients including three hospital staffers in the incident. While many patients died of burns, most died due to suffocation caused by carbon monoxide accumulation in the building. Critical patients trapped inside the smoke-filled ICU were the biggest casualties. In a desperate bid to rescue them, windows were broken by the local residents as fire-fighters collapsed due to humongous smoke.

FOLLOW UP ACTION

Hon'ble Chief Minister of West Bengal, Ms. Mamata Banerjee, who also holds the health portfolio, cancelled the license of the hospital immediately. A judicial investigation into the entire catastrophic incident was ordered. Six members of the hospital board, including leading industrialist Shri S. K. Modi, were arrested on charges of culpable homicide and negligence. The Calcutta High Court on February 24, 2012 granted bail to AMRI Director, Shri R. S. Agarwal, but rejected similar pleas of four other board members, including Shri R. S. Goenka, Shri Manish Goenka, Shri Prasant Goenka and Shri Ravi Todi of the hospital. Two renowned doctors of the hospital, Dr. Mani Chettri, the managing director, in whose name the hospital had the licence, along with another doctor Dr. Pranab Dasgupta were also arrested.

In response to the arrests made, FICCI came and issued a public statement that it was important to fix the responsibility of those directly involved in managing the hospital and distinguish them from others. At the same time, those who are not found guilty and are not responsible for day to day operations of any business should be released immediately. Implicitly, FICCI condemned the arrest of board of directors and demanded their release immediately stating that it would spread negative sentiments within the domestic investor community and discourage future philanthropic activity under which more hospitals have been established.



Aggrieved relatives of the deceased of the AMRI hospital Fire breakout

RELIEF

An ex-gratia grant of Rs 2, 73, 00,000 at the rate of Rs 3 lakhs per casualty was provided to the next of kin of the deceased in the AMRI hospital fire by the Government of West Bengal. A sum of Rs 1.5 lakhs was drawn from the State Disaster Response Fund and an equal amount was drawn from the State budget for the purpose. At the Central level, the Prime Minister sanctioned an ex-gratia relief of Rs 2 lakh each to the kin of the deceased and Rs 50,000 each to those injured, from the PM's relief fund.

The Government of West Bengal also decided to provide job to the next of kin deceased in the fire breakout. The government job opportunity was also extended to the next of kin of deceased who belonged to other states as well including Tripura, Jharkhand, and Kerala. Meetings were also organized between the administration and police department officials to discuss the establishment of six new fire stations at most fire-prone commercial zones, including Burrabazar, Garia, Parama Island and Tiljala.

WAY AHEAD

While insensitive and unacceptable patient care in India hospitals has been repeatedly talked about, the advent of high-end super-speciality hospitals with so called state of the art facilities has been shown as an answer to the lack of patient centric approach of the hospitals has proven to be an eye wash. While the patients have no choice but to surrender his life into the hands of such facilities, the governance should be proactive enough to make basic preventive mechanisms a regulation. Lack of regulations, awareness and trainings of the staff, poorly planned facility and unaccountable management of the hospital are the foremost reasons behind such tragedies. Disaster Risk Reduction in health facilities and hospitals is possible by including prescribed risk reduction measures in the design and construction of all new health facilities, and by reducing vulnerability in existing health facilities through measures such as demolishing the highly risky buildings and strengthening the important critical facilities.

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Road Accidents

According to WHO statistics (year 2002) about 11.8 lakh people die every year in road accidents in the world, of which 84,674 deaths are reported to take place in India alone. In 2004 the number of deaths had increased to 92,618. The mortality rate in India is 8.7 per hundred thousand population, as compared to 5.6 in UK, 5.4 in Sweden, 5.0 in The Netherlands and 6.7 in Japan. In terms of mortality per 10,000 vehicles, the rate in India is as high as 14 as compared to less than two in developed countries. A study by the Planning Commission in 2002 estimated that the social cost of road accidents in India is at Rs.55000 crore annually, which constitutes about 3% of the GDP, whereas the cost of road crashes has been assessed at one to two per cent of GDP in developed countries.

In India, there has been an alarming increase in road accidents at a rate of 8% per year, while the population of the country has increased by only 2.1%. In fact, out of one lakh accidental deaths in India, road accidents alone account for as many as 60,000 lives. The problem of road traffic accident has assumed alarming proposition with ever increasing number of motor vehicles competing for the limited paved space. The resultant congestion in traffic becomes inevitable and the consequences are road accidents.

Road safety incorporates the development and management of road infrastructure, provision of safer vehicles, legislation and law enforcement, mobility planning, provision of health and hospital services, child safety, urban land use planning, etc. Its ambit spans engineering aspects of both, roads and vehicles on one hand and the provision of health and hospital services for trauma cases (in post-crash scenario) on the other. Road safety is a shared, multi-sectoral, responsibility of the government and a range of civil society stakeholders.

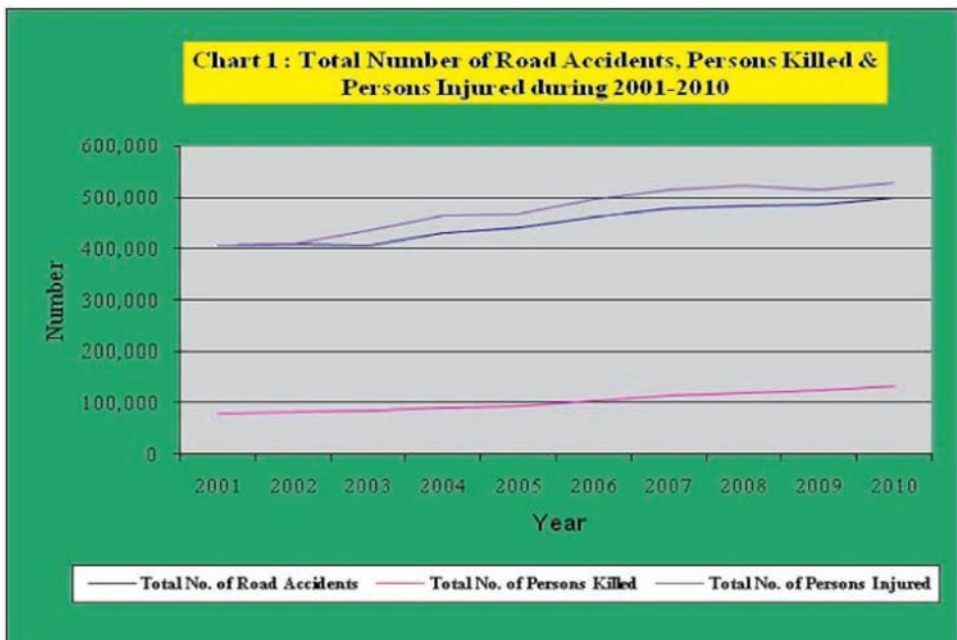
The Government of India constituted a Committee under the Chairmanship of Shri S. Sundar, former Secretary, Ministry of Surface Transport (MoST) in 2005 to deliberate and make recommendations on creation of a dedicated body on road safety and traffic management and to finalise a draft National Road Safety Policy for consideration of the Government. The Committee, while submitting its report in February, 2007 inter alia, recommended a draft National Road Safety Policy. Based on the recommendations of Sunder Committee, the Union Cabinet approved National Road Safety Policy on March 15, 2010. As per the National Road Safety Policy; (i) road accidents have now become a major public health issue and the victims are mainly the poor and vulnerable road users; and (ii) regardless of jurisdictions, the Central

and State Governments have a joint responsibility in reducing the incidence of road accidents, injuries and fatalities.

According to the Ministry of Road Transport and Highways, Government of India, motor vehicle population has grown at a compound annual growth rate (CAGR) of 10 per cent during 2000-2009. Due to a rising tide of motorization, traffic risk and exposure have grown. During 2010, there were around 5 lakh road accidents, which resulted in deaths of 134,513 people and injury to more than 5 lakh persons in India. These numbers amount to approximately one road accident every minute and one road accident death every four minutes.

The loss to the Indian economy due to fatalities and accident injuries is estimated at 3% of GDP. In 1999-2000, it was particularly severe as 53.1% of road accident victims were in the age group of 25 to 65 years and while in 2010, pedestrians, bicyclists and two-wheelers, who comprise the most unprotected road users, accounted for around 40% of all fatalities.

Profile of Road Accidents



(Source: Ministry of Road Transport & Highways, Government of India)

During 2010, 499,628 road accidents were reported by all states/ Union territories (UTs). Out of these, about 23.9% (119,558) were fatal accidents. The proportion of fatal accidents to total road accidents has consistently increased since 2001 from 17.6% to 23.9% in 2010. The severity of road accidents, measured in terms of persons killed per 100 accidents, has also increased from 19.9 in 2001 to 26.9 in 2010. During 2010, the number of road accidents per lakh of population was highest in Goa (267), followed by Puducherry (115) in contrast to a low of 1.6 reported in Nagaland.

The analysis of road accidents in terms of causes reveals that drivers' fault is the single most important factor responsible for accidents, fatalities and injuries. Drivers' fault accounted for 78.0 % (389,885 accidents) of total accidents; 74.6 % (100,319) of the total number of persons killed and 79.8% (420,823) of the total number of persons injured in road accidents during 2010. The fault of the cyclists and that of the pedestrians were marginal in causing road accidents during 2010. Defects in the motor vehicles were also one of the causes of fatalities in road accidents.

The main thrust of accident prevention and control across the world has been on 4 Es, viz (i) Education, (ii) Enforcement, (iii) Engineering, and (iv) Environment and Emergency care of road accident victims. The Government of India has been focusing on all these four approaches in its policies and programmes. The Ministry of Road Transport and Highways (MoRTH) constituted five separate working Groups on four Es of Road Safety viz. (i) Education (ii) Enforcement (iii) Engineering (roads as well as vehicles) and (iv) Emergency care to lay out the macro and micro dimensions with potential solutions to road safety and to suggest short term and long term measures to curb road accidents in the country. These groups have submitted their reports. The Ministry intends to bring out a detailed policy document including action plan on road safety on the basis of recommendations of the reports of Working Group on 4 Es.

The safety of road users is primarily the responsibility of the State Government concerned. However, MoRTH has taken several steps to improve road safety for road users, which include:

- To ensure that road safety is the integral part of road design at planning stage.
- To take various steps to enhance road safety such as road infrastructure, road markings/road signs, introduction of Highway Traffic Management System using Intelligent Transport System, enhancement of discipline among contractors during construction, road safety audit on selected stretches, have been undertaken by National Highways Authority of India.
- To organise refresher training to heavy motor vehicle drivers in the unorganized sectors

being implemented by the Ministry since 1997-98 under plan activities.

- To set up model driving training school in the states by the MoRTH.
- To conduct a publicity campaign on road safety awareness both through the audio-visual and print media by the MoRTH.
- To institute national awards for voluntary organizations/individual for outstanding work in the field of road safety.
- To tighten safety standards of vehicles like seat belts, power-steering, rear view mirror, etc.
- To provide cranes and ambulances to various State Governments/NGOs under National Highway Accident Relief Service Scheme.
- To provide ambulances at a distance of 50 Km. on each of its completed stretches of National Highways under its Operation and Maintenance contracts.
- To widen and improve National Highways from 2 lanes to 4 lanes and 4 lanes to 6 lanes, etc

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Cyclone Thane

OVERVIEW

Cyclone is a natural hazard, which can neither be prevented from occurring nor can it be controlled or modified. Cyclone Thane made a landfall on the coast of Tamilnadu (Cuddalore District) and Puducherry in the early hours of December 30, 2011. The cyclone Thane was detected early and IMD issued warning much in advance. The first IMD warning was issued on December 25 2011.

There were precautionary alerts from IMD from December 25 onwards (five days in advance) and the cyclone movement was then closely monitored by administration of Cuddalore and Puducherry with the help of IMD. The district administration conducted an emergency meeting on December 29 morning at the respective districts. Specific tasks were assigned to district and sub district functionaries such as PWD, Electricity Board, Water Board, Fire, Police, etc. NDRF battalions were alerted on December 29 itself and it arrived from Arakonam in the evening to Cuddalore. The cyclone struck coastal region of Tamil Nadu and Puducherry in the early hours of December 30 causing huge devastation. The damage was more in the Puducherry town area, affecting the trees, roads, buildings, including inundation in some coastal areas along the beach road. Affected people had to be evacuated to nearby Government schools and community halls. People along the coast were shifted to the cyclone shelters, constructed by Government in 1985 and 2009, in Puducherry and Tamil Nadu. The administration, Cuddalore inspected coastal villages on morning of December 29 and alerted villages not to venture out to sea and not to sleep in thatched huts during night hours and not to station their vehicles under tree. The administration also advised vulnerable population to stay in the earmarked shelters. The food and water was supplied to the evacuated people by the Government agencies as well by the community leaders. During the day the administration addressed gathering at various vulnerable villages taking the help of head men, religion heads, divisional officers, etc. The DC went on AIR Puducherry and Chennai and local TV channels on December 29 evening announcing various public safety measures. The administration mobilized 108 ambulance vehicles from neighbouring districts.

IMPACT:

The cyclone made a landfall over Cuddalore and Puducherry on the morning hours of December 30, 2011, with a wind speed of 145-150 km per hour, causing loss of 53 human

lives (41 in Tamil Nadu and 12 in Puduchery) and massive property damages (details are given in the table below for Tamil Nadu and Puducherry). The Cuddalore district has a population of 26, 00,880 as per 2011 census. Approx. 7500 people in Cuddalore and 1760 people in Puducherry were provided shelter in community halls. Some of the people after seeing the intensity of the cyclone and high tides (storm surge) evacuated on their own to safe shelters near Chidambaram Taluk (Killai and Parangipettai areas). Transport provisions were arranged by District authorities for such evacuees. As a precautionary measure, the administration had cut the power supply on 29th evening both in Cuddalore and Puducherry, anticipating the damage and for preventing electrocution.

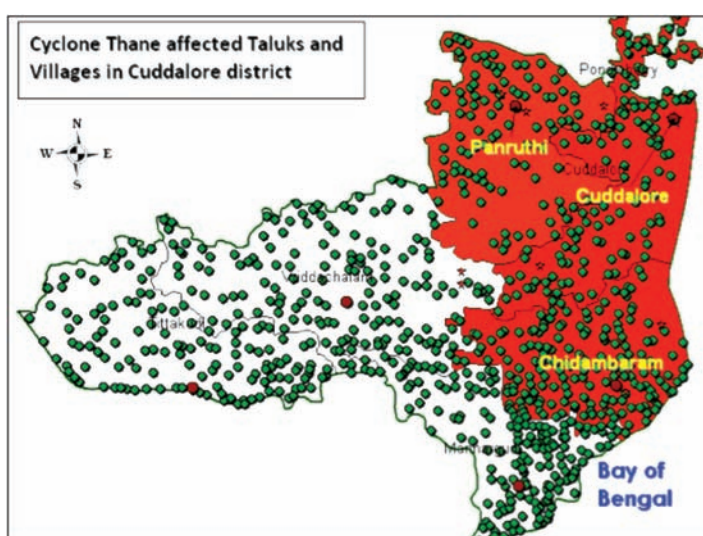


Fig. 1 Cyclone- Thane affected areas in Tamil Nadu (Source: Independent NGO Team)

Following are the tables showing the State wise damages in various sectors:

A: Tamil Nadu, District-Cuddalore (Source: Govt. of Tamil Nadu, Memorandum submitted to Central Team)

I. Human Lives Lost:

S. No.	Name of Taluka	Male	Female	Total
1.	Cuddalore	5	7	12
2.	Panruti	5	6	11
3.	Kurinjipadi	3	1	4
4.	Chidambaram	6	3	9
5.	Kattumannarkoil	-	1	1
6.	Vridhachalam	2	2	4
	Total	21	20	41

II. Loss of Cattle:

Cows	Calves	Total	Bullock	Calves	Total	Buffalos	Calves	Total	Goat	Grand Total
47	29	76	4	3	7	9	5	14	246	343

III. Loss of Poultry:

Hen	Duck	Quail	Total
52938	285	6200	59423

IV. Damages to the Houses:

S.No.	Name of Taluka	Huts		Titled Houses (severely damaged)	Total
		Fully damaged	Partly damaged		
1	Cuddalore (Rural)	49511	-	26835	76346
2	Cuddalore (Town)	302	16094	15833	32229
3	Panruti	18545	50650	26153	95348
4	Kurinjipadi	3058	39799	10916	53773
5	Chidambaram	1362	82556	16458	100376
6	Vridhachalam	413	6883	-	7296
7	Kattumannarkoil	101	175	10	286
8	Thittagudi		228	-	228
	Total	73292	196385	96205	365882

V. Details of Damage to agriculture sector:

Sl. No.	Crops	Total Cultivated area (Ha)	Area damaged (Ha)	Percentage	Remarks
1	Paddy	96391	70271	72.90	Flowering and Harvesting stage
2	Groundnut	9394	2274	24.21	Sown & vegetative stage
3	Black Gram	14132	7000	49.53	Sown & vegetative stage
4	Sugarcane	29700	6833	23.01	Planting & growth stage
5	Coconut	2363	939	39.74	20 years old yielding palms
6	Cotton	7452	110	1.48	Boll stage
7	Oil Palm	1100	46	4.18	4 years old and yielding palms
	Total	160532	87473	54.49	

VI. Damage to Roads:

Sl. No.	Details of the road	Length of the Road damaged (in km)
1	State Highways	646.00
2	Municipal Roads	101.00
3	Town Panchayat Roads	16.50
4	Panchayat Union Roads	820.00
	Total	1583.50

VII. Damages to Horticulture Crops:

Sl.No.	Crops	Total Cultivated area (Ha)	Area damaged (Ha)	Percentage	Remarks
1	Cashew	30349	23500	77.43	Uprooting of trees and breaking of branches, stripping of leaves
2	Banana	4805	2968	61.77	Dislodging of trees
3	Jack	811	502	61.90	Uprooting of trees and breaking of branches
4	Mango	663	317	47.81	
5	Guava	446	290	65.02	
6	Tapioca	4154	73	1.76	Damage to whole plants
7	Vegetables	550	320	58.18	Stripping of leaves & breaking of vegetative parts
8	Flowers	576	250	43.40	
9	Betel vine	128	128	100	Destruction of whole plantation.
10	Amla	35	12	34.29	Uprooting of trees and breaking of branches
11	Citrus	94	30	31.91	
12	Sapota	60	10	16.67	
13	Turmeric	652	02	0.31	Whole damage to crop
14	Coriander	65	16	24.62	
15	Cocoa	90	61	67.78	Just planted seeding destroyed
16	Curry leaves	55	10	18.18	
	Total	43533	28489	65.44	

VIII. Damages to Infrastructure of Electricity Board:

S. No.	Details	Total (No.s)	Damaged (No.s)	Percentage (%)
1	Electric Poles	384972	45460	11.80
2	Distribution lines (kms)	81296	10470	12.00
3	Transformers	9226	4715	51.00
4	Sub Stations	47	47	100.00

IX. Damages to Street Lightings:

Areas	Total No. of Street Lights	No. of Street Lights damaged	Percentage (%)
Rural	75237	64119	85.22
Urban			
a) Municipalities	14973	13071	87.30
b) Town Panchayats	14485	6276	43.33

X. Damage to Fishing Boats and Accessories:

Details	Fully damaged	Partly damaged	Others	Total
Motor Boats	4	101	-	105
FRP Catamarans	58	1430	-	1488
MFB Outboard Engines	67	106	-	173
Ordinary Catamarans	240	16	-	256
Engines	-	-	1262	1262
Fishing nets (kgs)	-	-	194949	194949
Total	369	1653		

B. Union Territory of Puducherry (Source: Govt. of Puducherry, Memorandum submitted to Central Team)

I. Extent of damage due to Thane cyclone in Puducherry:

8.1.3	Severely damaged pucca houses		736	
8.1.4	Severely damaged katcha houses		12493	
8.1.5	Partly damaged houses (pucca + kutchra)		33009 (12568+20441)	
8.1.6	No. of huts damaged		38450	
9	No. of human lives lost		12	
10.	No. of persons who suffered grievous injuries		16	
11	No. of persons who suffered minor injuries		16	
12	Animal + Poultry Loss		1278 animals + 66468	
12.1	No. of milch animal lost		1102	
12.1.1	Buffalo/Cow/Camel/Yak		256	
12.1.2	Sheep/Goat		846	
12.2.3	Others (indicate name)		176 (pig/rabbit)	
12.1.4	No. of poultry birds lost		66468	
13.	Damage to public properties			
13.1	Roads (All)	Length in Km	270	
13.1.1	State Roads	Length in Km	24.277	
13.1.1 a	NG/ECR	Length in Km	35	
13.1.2	District Roads	Length in Km	133.223	
	Rural Roads	PWD	Length in Km	77.50
		Local Administration	Length in Km	221.29
13.2	Bridges & Culverts	No.	198	
13.2.1	Bridges	No.	10	
13.2.2	Culvert	No.	188	
13.3	Drinking water supply	PWD	No. of Schemes	350
		Local Administration	No. of Schemes	111
13.4	Irrigation Sector	No. of Schemes	110 km/50 Nos	
13.5	Power Sector	No. of Schemes	General Schemes; 11 Nos.	
	Renewable Energy Agency Puducherry	No. of Schemes	3	
13.6.1	Primary Schools (Damaged/Destroyed)	No.of buildings/classrooms / Toilets/Compound wall/Roof/OHT	141	
13.6.2	Higher/Higher Secondary School (Damaged/Destroyed)	No. of buildings/classrooms/ Toilets/Compound wall/Roof/OHT	44	
13.6.3	Other educational institutes (Damaged/Destroyed)	No. of buildings (sports complex)	1	
13.7.1	PHCs/Qtrs./General Hospital/women & child hospital (Damaged/ Destroyed/Bldgs.) CHCs/ Qtrs./Hospitals/Malaria Unit/Leprosy/PMRC (Damaged/Destroyed)	No. of buildings	55	
13.7.3	Other buildings	LAD	No. of buildings	108

Most of the deaths during Thane cyclone were due to house collapses. The cyclone was accompanied by rains and gale that uprooted thousands of trees, knocking down electric poles, transformers, transmission towers, snapping power supply in several areas. National and State Highways were completely blocked. Power supply was severely affected. Water supply was affected mainly due to power failure. Fuels (petrol, diesel, etc.) shortages were reported on 30th itself due to power failure and short supply. Thatched houses were completely damaged mainly in the most affected region of Cuddalore, Panruti, Kurunjipadi and Chidambaram Talukas in Tamil Nadu. Semi concrete buildings and fully concrete were also damaged at some places in both Tamil Nadu and Puducherry. Massive damages to crops, mainly to cash crops such as cashew nuts, banana, coconuts, sugarcane were reported from both Tamil Nadu and Puducherry. Severe damage to paddy and other crops was also reported. Landlines (including fax) were not working at district head quarters, but mobile phones (including internet) were reported to be working, though the network was very poor.



A school damaged in Cuddalore



Damaged boats in Union Territory of Puducherry.

REPONSE AND RELIEF MANAGEMENT:

The priority task, of clearing the highways (national and state), was achieved by December 30 evening in Tamil Nadu. NDRF and police provided help in this task. Approx. 400 generator sets were mobilized in Tamil Nadu, from various agencies, both from Chennai and other districts, including private agencies and some of these were used for operation of petrol pumps. The technicians from IOC and BPL and some other agencies were roped in to operationalize filling stations. Long cues were reported on 30th but by 31st, the situation was brought under control. Some of these Gen sets were deployed for restoring water supply. Water tankers (70) were also mobilized from Chennai (Metro Water), and some from Neyveli Lignite Corporation, NOCL etc in Cuddalore district, Tamil Nadu. Local engineering colleges volunteered water supply from their bore wells. The corporate also participated in providing Gen sets and restoration of essential services. For urban water supply, a large Gen set was mobilized from Thiruvannmalai district, Tamil Nadu.

Entire Tamil Nadu state machinery was supporting and DC was the coordinating officer. In Puducherry too it was done in the same way and the control room was operationalized the moment the cyclone was reported by the IMD. In Cuddalore, seven senior IAS officers

(Secretary rank) were deputed to oversee the management. These officers looked after specific sectors such as Highways, Electricity, Water Supply, Law and Order, etc. The senior officers managed their respective sectors and DC coordinated the overall management process. Revenue officials were also deputed to ensure that there is no theft or untoward incidents. 2000 electricity board workers from other districts were engaged for power restoration in Cuddalore.

In Tamil Nadu and Puducherry ex gratia was paid to the family of victims who lost their lives (2 lakh each family). Immediate compensation was provided to fully damaged and partially damaged houses along with a relief kit comprising of 10 kg rice, saree and dhoti, kerosene and candles in Tamil Nadu. Restoration of power supply was the priority, as it caused many related problems such as water supply, sense of insecurity (theft), operation of essential service such as ambulances, health centres, etc. Milk supply was a major concern on 30th and AVIN (Government owned Milk Supply agency in Tamil Nadu) was roped in for filling the deficit. By January 2, 40% of power supply in urban areas, water supply and hospital services were restored. Rural water supply restoration took about a week in Tamil Nadu and Puducherry. By January 14, 2012 total power supply was restored in Tamil Nadu.

NIDM Team Visit to the Affected areas :

A two member team of NIDM (Hydro Meteorological Division) comprising Dr KJ Anandha 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 January 16-21, 2012 to document cyclone 'Thane' along with lessons learnt from the disaster and its management. The two member team visited Cuddalore district of Tamil Nadu from January 16-18, 2012 and held discussion with officials from District Administration, including District Collector, Sub Collector, District Revenue Officer (DRO), District Panchayati Raj Officer (DPRO) and others. They visited the affected villages of Chidambaram and Cuddalore Taluk and held discussions with local functionaries, such as Revenue Inspector, Tehsildar, Village Administrative Officer and Assistant Village Administrative Officer. The team had an interaction with local population in the coastal villages of Parangipettai, Annankoil, Mudasal Odai, Madavapallam, Ayampettai, Thaikkal and Thzankuda. The NIDM faculty members visited the taluka of Panrutti with Shri R. Ratnoo, Director, Fisheries Department and Monitoring Officer, Government of Tamil Nadu to document the damage to cashew plantations.



The team visited Puducherry from January 19-20, 2012 and held discussions with the District Collector, Puducherry officer in Charge (DM) and other local level functionaries. They visited the Emergency Operation Center (Control Room) at Puducherry and discussed with officials who made a presentation on emergency response during the cyclone. The team then proceeded to visit the affected villages such as Manalmedu, Parikapattu, Irulanchandai, Murthikuppam, Padukuppam and discussions were held with local people in these coastal villages on warning, evacuation, relief and recovery.

WAY AHEAD

The cyclone “Thane” was reported timely, regarding timing and location of its land fall and the early warning was very helpful for preparation to face the situation. However the devastation was very severe for the region, as these regions have never witnessed such severe cyclone in the past 50 years, as per the community’s version. The public as well as the administration have realised that the cyclone ‘Thane’ could had further severe impact, how ever as there was no storm surge, due to winds the impact was comparatively less, along the coast. Similar cyclone with more wind speed occurred in Orissa Coast in 1999 during the super cyclone, which had devastated the state’s economy, bringing the state to a halt. The community can be taught to be better prepared through awareness, training and community involvement in planning for such disasters. The volunteers can be mobilised in these areas, especially the youngsters, so that their energy is utilised in a positive way for the benefit of the community and the nation. Further the volunteers will be able to manage the disaster in a better way as they are located in the place of its occurrence and can utilise all the resources as they will be familiar with the area and start the operation immediately without waiting for administration and others, so that the golden hours are utilised in a fruitful way.

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Lessons Learnt

By three methods we may learn wisdom: first, by reflection, which is the noblest; second, by imitation, which is the easiest; and third, by experience, which is the bitterest." Confucius

The year 2011 witnessed a number of major as well as minor disasters, which were reported and many of them would have passed by unreported. On account of natural disasters, the loss of life was not much but in case of human made disasters, it was quite high. The fact however does not undermine the importance of mitigating the effects of both, natural as well as human made disasters. We have already discussed in the first chapter about how disasters result in loss of precious lives, damage to infrastructure and livelihood and carves a dent to the emotional well being of the affected community. It will be too huge a price to pay at the national level, at the community level and even at the individual level, if we do not learn from the past disasters and prevent the future hazards from becoming disasters. We need to incorporate the lessons learnt from the past disasters in our present to break the vicious cycle of hazards turning into disasters.

The **floods in Odisha** highlighted the acute need for initiation of plan for permanent flood control or long term measures to tackle the flood and reduce its impact in the State. It calls for community participation so that the community is trained to cope, manage and spring back to normalcy in the minimum time which also improves every year learning from their own experience, assisted by Government machinery.

Another issue which needs to be looked into is that the livelihood of marginal farmers or the poor generally depends on the livestock he/she owns and ultimately the health and well being of the livestock. This is truer when the farmer is faced with challenges of coping with disaster and trying to regain normal life. The livestock helps in regaining the normal life and livelihood, atleast by partly supporting the livelihood of the affected community. So it becomes imperative to cater to the livestock, in addition to care of human life and their settlement. This is possible by learning from Rajasthan, the way they manage the cattle population during drought, by way of "Ghosala" etc. so that there is some arrangement at each village as per convenience of the local population. The Government of Odisha might have realized that recurrent floods in these flood prone areas will have less impact, if livestock serve as part of their livelihood if they are also taken care of. This step will enhance the resilience of the farmers, after any disaster.

The recent figure of Planning Commission (Economic Times, March 20, 2012) shows that the population below poverty level in Odisha is 37.0% in 2009-10 as compared to 57.2 % in 2004-05 shows a good improvement. The situation can further improve if the recurrent disasters are efficiently managed and coping mechanism developed. Participation of local community in relief, rehabilitation and reconstruction work in the form of a core-team with Government officials along with other national and international stake holders is essential for success of proper management of the disasters. This will bring in the belongingness of the work being carried out and can lead to success, as the involvement of local community will ensure that it is as per the need of locality with all scientific input, as was seen in Gujarat Earth quake rehabilitation project of 2001.

The **Sikkim earthquake** highlighted the vulnerability of the state, and the region as a whole, to earthquake and a dire need for strict compliance with building bye-laws. The death of 16 people in the earthquake in hydroelectric power project shows that all developmental works, including power generation projects should incorporate disaster mitigation in their plans. We need to prepare not only for primary disasters but also resulting secondary disasters. As a result of the earthquake, a number of landslides were triggered. Hence, vulnerability assessment of the roads is extremely important. The roads were damaged not only due to earthquake but also because of resultant landslides and hence reaching the affected area was a tough task and took a lot of time. Precious lives were lost due to the delay caused in reaching the affected areas by the search and rescue teams. Therefore, the need of the hour is to frame strategies to construct and maintain major hospitals, school buildings and public amenity building for storage of essential life saving materials, to use as community halls, to store equipment and machinery for removal of damaged material, using disaster resistant technology of a higher order, so that these buildings not only serve as good examples of disaster resistant technology, but also could be utilized as relief shelters providing necessary support facilities. Despite the available knowledge base, the communities in high seismic regions such as Sikkim and neighbouring states are not adequately prepared, due to lack of implementation of earthquake-resistant building technology. However, with adherence to seismic codes and recommended construction practices, it is possible to mitigate such large-scale disasters.

The **Karnataka drought** drew attention to the fact that it was high time to think about the mainstreaming the drought risk management (DRM), especially in the areas which are prone to drought. The process can start with policy mechanism involving the stake holders, knowing their views how to go about it. The process will involve, defining a drought risk profile of various areas in the state, followed by identification of disaster risk management (DRM) options, defining the mainstreaming entry points, and finally internalizing DRM into the development framework. These steps can be followed by measuring the impacts of DRM mainstreaming, to

assess the situation and carry out the needful modification or corrective measures so that the policy can be framed for mainstreaming. All these steps are vital and would be successful if the stake holders are included in every step starting from planning to implementation.

The process of drought risk management can also include the policy decisions in the field of water and land resources, to manage the fresh water, excess of which results in flood and scarcity in drought. It should be a holistic approach of integrated water and land management, which is key to the drought proofing, so that the agriculture and allied activities, the main livelihood of almost two thirds population of the country sustains even in the absence of a normal monsoon.

The important issue highlighted by **Sabarimala stampede** is the need to streamline the pilgrimage in a systematic way step by step. The entry and exit routes for pilgrims should have been segregated to decongest, as the arrival of large number of pilgrims was known beforehand, to enable safe passage of pilgrims and also of the response teams. Vehicular parking should have been near the base camp, where all the vehicles could be parked in such a manner to make way for a safe way out. Their movement should have been streamlined and restricted keeping the capacity of the parking lot. The movement of the pilgrims should have been structured in a long zig-zag path leading to the temple and monitored constantly. For all this, the pilgrims should be registered as is being done in Sri Mata Vaishno Devi Temple and Thirumala Devasthanam in Andhra Pradesh. If possible, pilgrims, who have to perform a particular pooja, may be routed through different path and must have separate area for offering pooja or may be allowed at a different time. An integrated security plan, involving officials of temple administration, security staff and local police may be chalked out well in advance to have clear cut roles and responsibilities. Hospitals may be kept in ready condition to cater to any large influx of survivors from any such future incidents. Moreover, health administration within the temple administration must have liaison with both Government and private hospitals. For this an inventory of all the hospitals around the area may be done for future use. History of such incidents and the way in which these were dealt may be properly documented and displayed at different places for easy access to responders.

The **AMRI hospital fire** showed the possible violation of fire safety norms in this hospital, which took ninety one lives, needs a serious thinking regarding hospital fire safety in India or elsewhere in the world. Vital lessons need to be learnt by everyone who are connected with medical profession and governance at large. A no objection certificate has to be obtained from the Fire and Emergency Services before occupying/making use of a commercial building. The officials from the department need to conduct a spot inspection and suggest safety measures considering the purpose for which the building is used, its dimensions, the staff strength, the nearest approach road and its width, etc. A total adherence to these suggestions could minimise, if not, avoid fire accidents. However, many choose to bypass this crucial

procedure before occupying buildings. The reason is not far to seek. The implementation of safety measures recommended by the department is always ignored due to investment of considerable money and the process is conveniently given a go by. The fire breakout incidents point out at the need for new hospitals to be safeguarded by risk- sensitive siting, design and building in compliance with building codes. We need to develop and implement national policies and programmes to make health facilities safe not only in emergencies but also in peace times.

The key issue in case **Cyclone 'Thane'** was that not many in both Cuddalore and Puducherry areas in spite of such accurate warning did not evacuate to safe shelters before the weather conditions deteriorated. This approach of 'wait and see' might have become very costly, had there been greater storm surge than what was observed during Thane. While poor maintenance of cyclone shelter remains one of the issues for people not moving easily to such shelters, a long absence of any severe cyclone affecting these areas has also been widely cited to be the reason for not believing that the cyclone's impact can be so damaging.

The other issue which was noticed was the lack of crop insurance in place in many areas. The areas where cashew nut tree plantation (Panrutty Thaluk) was heavily damaged, though this area was not very near to the coast, there is a realization among farmers that that they should have gone for crop insurance, as these crops take 6-7 years for full growth after cashew plantation. These farmers would have to wait for seven years to come to normalcy as their livelihood depends on these plantations. The Government can plan for some subsidy to promote insurance policies in such cases so that the financial burden is shared and the farmers have a responsibility and need not wait for the relief from the Government sector all the time, after such disasters.

The disaster history of 2011 has set the tone for accentuating that investments are made in disaster risk reduction in the reconstruction of housing, infrastructure, and other community assets. We need to frame strategies to construct and maintain major hospitals, school buildings and public amenity building using disaster resistant technology of a higher order, as pointed out above. Moreover, techno legal and techno financing regime should be brought in to ensure that all public funded housing and buildings and construction, be it for health, education, industry, community amenities, etc. be built only with disaster resistant construction features. Further, public financing institutions for housing and infrastructure development should be advised to extend financial assistance to projects from States only when disaster resistant construction features are introduced in the proposed housing and building construction programmes.

Annexure 1

Drought in Andhra Pradesh

Andhra Pradesh has an area of 2,75,069 sq km with a population of 84,665,533 and literacy of 67.66%. The basins of Godavari, Krishna and Pennar and their tributaries serve as a constant source of irrigation for the state. Agriculture has been growing at a rate of 3.5 % per annum since 1995-96 and the state ranks twelfth in the food grain yield per hectare. The state grows a whole range of food crops, cash crops and fruits- rice, wheat tobacco, groundnut, bananas and mangoes. It is the largest producer of rice for which it is called the 'rice bowl of India'.

Government of Andhra Pradesh had been reviewing the seasonal conditions from time to time in the State during the South West Monsoon 2011. During the South West Monsoon Period (1.06.2011 to 30.09.2011), the State had received an average rainfall of 624.1 mm, with a deviation of (-) 15%. Several mandals spread over 20 districts had received deficit rainfall of above (-) 20%. This deficit rainfall resulted in damage to standing rain-fed crops in more than 15 lakh hectare area due to moisture stress.

Based on the district collector's report on scanty/ deficit rainfall with dry-spells resulting in reduction of sown area and moisture stress to the crops sown, State Government after careful examination declared 456 mandals in 15 districts, namely, Anantapur (63), Nalgonda (52), Karimnagar (50), Medak (43), Mahabubnagar (41), Prakasam (38), Khammam (31), Kurnool (29), YSR Kadapa (28), Rangareddy (26), Chittoor (13), Krishna (13), Guntur (11), Srikakulam(10), and Visakhapatnam (08) as drought affected mandals.

The concerned district collectors were requested to take further necessary action and notify the specific mandals/specific areas in the mandal in the district gazette to enable farmers to avail credit facilities and to take up relief operations. The concerned district collectors were instructed to ensure deletion of the notified municipal/ urban areas and the areas falling under permanent assured irrigation sources where water is being supplied for crops from drought affected mandals though for purpose of drinking water only they shall be treated on par with drought affected mandals. Necessary steps were taken to prevent distress migration by providing work to all needy under Mahatma Gandhi National Rural Employment Guarantee Programme.

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Annexure 2

Brief of Other Disasters during 2011				
S. No.	Date	Disaster and Lives Lost and Injured	Damage Caused	Source
Road Accidents				
1.	06.01.2011	Uttarakhand bus mishap 22 lives lost 19 injured	At least 22 people, including 7 women and six children, were killed and 19 injured when a bus carrying businessmen and their families fell into a gorge in Kuthalgate area near Dehradun. The mishap occurred when the bus, going to Haridwar from Mussoorie, skidded off the road and fell into 50-feet-deep gorge. Most of the victims died on the spot. The injured have been admitted to Doon government hospital. Uttarakhand Chief Minister Ramesh Pokhriyal Nishank announced a compensation of one lakh rupees each to the next of the kin of the deceased.	News on AIR
2.	15.01.2011	Varanasi road mishap 15 lives lost	At least 15 people died in a road accident in Varanasi. The mishap occurred when the front tyre of a bus carrying the victims burst and fell into river Varuna under Kapsethi police area. Police have recovered all the 15 bodies.	News on AIR
3.	15.02.2011	Road accidents in Rajasthan 31 lives lost 14 injured	31 people were killed and 14 injured in three road accidents at different places of the state. In a major accident in Nagaur district on Nagaur - Ajmer National Highway, 22 people died on the spot when a jeep in which they were travelling collided with a truck. 11 people were seriously injured. In another accident in Sikar district, seven people were killed in a collision of jeep and a truck.	News on AIR
4.	03.03.2011	HP road accidents 40 lives lost	In Himachal Pradesh, at least 40 people have been killed and four injured in two separate road accidents in Chamba district. In the first accident, 31 people have been killed when a truck carrying a marriage party fell into a gorge, 60 kilometres away from Chamba. All 31 bodies have been recovered and the injured have been admitted to the district hospital. In another accident, nine people were killed when a private vehicle plunged in to Rabi river in Dharmar area.	

Brief of Other Disasters during 2011				
S. No.	Date	Disaster and Lives Lost and Injured	Damage Caused	Source
Road Accidents				
5.	18.03.2011	Pilgrims killed in Maharashtra accident 17 lives lost	At least 17 pilgrims, including nine women, were killed and 18 injured when a luxury bus plunged into a gorge near Malkapur in Buldana district of Maharashtra. The bus was returning from Omkareshwar pilgrim centre in neighbouring Madhya Pradesh to Wardha when the accident occurred at 4 am. The bus was crossing a bridge on the Talaswada bridge on Nalganga river in Buldana district, around 400 km from Nagpur, when it suddenly crashed on the railings and fell into the 70-foot-deep gorge.	Hindustan Times
6.	04.04.2011	Ten killed in Himachal accident 10 lives lost	Ten people were killed and 25 injured when a private bus skidded off the road and fell into a gorge in Himachal Pradesh's Chamba district. The accident took place in Koti village, about 22 km from Chamba town where it was headed to.	Indo-Asian News Service
7.	28.04.2011	Bus-truck mishap 12 lives lost	At least twelve people, including eight students and two lecturers of a private institute of management, were killed and 22 others injured in a head-on collision between the college bus and a truck in the Yamuna Nagar district. The bus of the Shri Ram Institute of Management and Technology collided head-on with the truck coming from opposition direction near Manakpur village on Yamuna Nagar- Paonta Sahab national highway-73.	DD News
8.	13.05.2011	Road accident in Dholpur 19 lives lost	50 injured Nineteen people were killed and 62 others injured in two separate road mishaps in Rajasthan. 11 men were killed when a truck carrying a marriage party overturned in Dholpur district. The incident occurred near Arua-ka-Nala area when the victims were returning to their native village after attending the marriage function at nearby village.	Press Trust Of India
9.	17.05.2011	Bus accident in Bankura 12 lives lost	50 injured At least 12 people were killed and 50 injured when a private bus lost control and overturned on a road in Meghnath jungle in West Bengal's Bankura district. The driver, who lost control of the bus, was among those killed. The injured passengers were rushed to Sammilani Medical College in Bankura town. The bus was going from Purulia to Kolkata.	The Hindu
10.	22.05.2011	Train hits jeep in Bihar 16 lives lost 4 injured	Sixteen people, including 15 women, were killed and three others injured when a jeep in which they were travelling was hit by the Garib Rath Express at an unmanned railway crossing near Bharia-Bishanpur village in Madhubani district of Bihar. While twelve people were killed on the spot, three died on way to a hospital and one person succumbed to injuries at the hospital. The mishap took place when the jeep was hit by the speeding Nizamuddin-Jainagar Garib Rath Express when it was trying to cross over to the other side of the railway track.	Press Trust Of India
11.	23.05.2011	Death toll rise in Bihar train-vehicle collision 21 lives lost	In Bihar, the death toll in train and jeep collision in Madhubani district has risen to 21. Among those killed include 11 women, nine children and driver of the jeep. The collision between the overcrowded jeep and Jay Nagar bound Garib Rath Express took place at an unmanned railway crossing near Mangarpatti Railway halt.	News on AIR

Brief of Other Disasters during 2011

S. No.	Date	Disaster and Lives Lost and Injured	Damage Caused	Source
Road Accidents				
12.	31.05.2011	Two road mishaps in Assam 36 lives lost	17 injured Thirty-six people were killed and 17 others injured in two road mishaps in Assam where a bus carrying a marriage party fell into a pond and an oil tanker caught fire. 31 passengers, including 12 women, were killed and six persons critically injured when a bus carrying a marriage party fell into a pond in Kamrup (Rural) district. The bus travelling from Guwahati to Dihu in Rangia sub-division of the district, fell into the 40 ft deep pond at Rajabari when a wooden bridge it was crossing gave in.	Press Trust Of India
13.	08.06.2011	Charred to death in Tamil Nadu bus accident 22 lives lost	At least 22 people, including five women, were burnt to death in Tamil Nadu when their bus fell into a pit and its diesel tank caught fire. Only one passenger and the bus driver had a miraculous escape. While trying to avoid hitting another vehicle, the Pollachi-bound bus belonging to KPN Travels crashed into the pit near Vellore district, around 120 km from Chennai	IANS
14.	21.06.2011	UP twin road accidents 10 lives lost	In Uttar Pradesh, 10 people including six police personnel, were killed in two road mishaps on Lucknow -Delhi National Highway in Sitapur district during wee hours. The second accident took place under Ataria police station area when police team inspecting first accident site was run over by a truck. The first mishap was caused due to collision between the two trucks. While 7 people including six police personnel, died on the spot, 3 succumbed to their injuries later.	News on AIR
15.	07.07.2011	Train-bus collision in UP 33 lives lost	At least 33 people were killed and 17 injured when a train rammed into a bus at an unmanned crossing in Etah in Uttar Pradesh in the wee hours. The accident occurred at Kanshiramnagar at around 2 am when the train was on its way from Mathura to Chapra in Bihar. 33 people were killed and 17 injured in the mishap. The ill-fated bus was carrying a marriage party.	The Times of India
16.	02.08.2011	Bus falls into river in Madhya Pradesh 26 lives lost	At least 26 passengers were killed after a private bus, on its way to Jabalpur from state capital Bhopal, fell into the swollen Barna river in Raisen district of Madhya Pradesh. The mishap took place, 100 km away from the district headquarters. The bus carrying over 60-70 people fell into the river after its tyre burst while crossing the bridge, breaking the railing. Only 26 bodies could be recovered from the river.	The Hindu
17.	11.08.2011	Bus falls into gorge in Chamba 12 lives lost	Twelve people were killed and one sustained grievous injuries when a bus carrying them fell down an 80ft deep gorge to plunge into the swollen Bihali river in Chamba district of Himachal Pradesh. Some passengers were also reported missing from the ill-fated vehicle, which was on its way to Dalhousie from Bhanjraru and was carrying 25 passengers. The accident took place around 9am, near Shikari Mod (curve), when the driver lost control of the vehicle.	The Times of India
18.	15.08.2011	Himachal road accident 15 lives lost 7 injured	Fifteen persons were killed and seven others injured when a bus carrying a troupe of folk dancers from Leh in Jammu and Kashmir plunged into a deep gorge in Lahaul and Spiti district. The mishap occurred near Gamoor, 20 km from Keylong, the district headquarters of Lahaul and Spiti. In all 22 members of the troupe were travelling in the bus when the mishap took place.	DD News

Brief of Other Disasters during 2011				
S. No.	Date	Disaster and Lives Lost and Injured	Damage Caused	Source
Road Accidents				
19.	04.09.2011	Bus falls into river in Uttarakhand 15 lives lost 12 injured	At least 15 people were killed and eight were missing when a bus fell into a swollen Tons river in the hilly Tyuni Market area. 15 bodies were recovered and 12 injured people were rushed to nearby hospitals. The bus was on its way from Katiyal area to Dehradun when it fell into the river as the driver was negotiating a sharp turn.	The Hindu
20.	06.09.2011	Tamil Nadu bus accident 14 lives lost	Fourteen people were killed and several others were injured when two buses collided head-on near Tiruchirapalli in Tamil Nadu. According to a statement issued by the Government, a Tamil Nadu state transport bus collided head-on with a private bus that was travelling from Puducherry to Thiruvanthapuram. Seven seriously injured were admitted to the government hospital in Tiruchirapalli, some 320 km from Chennai.	The Times of India
21.	06.09.2011	Himachal Road accidents 14 lives lost	Fourteen people were killed and four injured in two accidents in Himachal Pradesh's Sirmaur district. In both the accidents, the vehicles skidded off the road and fell into the Giri river, a tributary of the Yamuna. In the first accident, seven members of a family, including three women, were killed when their Maruti van fell into the river near Dadahu village, some 180 km from Shimla. In another accident, a pick-up vehicle carrying nine people fell into the river near Shealbagh village in Rajgarh subdivision, some 100 km from Shimla	The Times of India
22.	19.09.2011	Road accident, Jharkhand 20 lives lost 25 injured	Twenty people were killed when the bus in which they were travelling, collided with an iron-laden trailer near Bundu, about 50 km from Ranchi. The bus was going to Arah in Bihar from Jamshedpur when it collided with the trailer around 3.30 am, killing 13 people on the spot and seven in hospitals. About 25 others were injured with 14 of them stated to be serious.	DD News
23.	20.09.2011	Road Accident 20 lives lost 22 injured	At least 20 people were killed and 22 injured on Monday in a collision between a bus and another vehicle, carrying iron rods. The rods speared through the bus. The accident occurred at Bundu on the outskirts of Ranchi, on the Ranchi-Jamshedpur national highway at 3 a.m., police said. The bus was carrying 45 people and was proceeding to Arra district of Bihar from Jamshedpur.	The Hindu
24.	15.10.2011	Road accidents in Karnataka 12 lives lost 27 injured	Twelve people were killed, including two children, and 27 were injured in two separate accidents in Karnataka. Eight persons, including six women, were crushed to death and nine were injured when a loaded truck rammed a stationary multi utility vehicle (MUV) near Aurad village in Jewargi taluk in Gulbarga district on the Bidar-Bangalore State Highway.	The Hindu
25.	25.10.2011	Bus plunges into gorge in HP 25 lives lost	The accident occurred at 5.30pm when a bus that was headed for Bandla village developed a snag 4 km from Bilaspur town. In a hurry to reach home, stranded passengers, most of them Diwali shoppers, stopped another bus going to Bandla village and began boarding it. Since the bus was already overloaded, some people climbed atop. The bus, which was parked on the roadside, began rolling backwards and fell into the gorge.	DDI News

Brief of Other Disasters during 2011				
S. No.	Date	Disaster and Lives Lost and Injured	Damage Caused	Source
Road Accidents				
26.	28.11.2011	Maharashtra accident 15 lives lost 57 injured	At least 15 people were burnt to death and 57 others injured when two private luxury buses collided and sparked off a fire early Monday in Maharashtra's Buldhana district. Twenty of the injured are said to be in a critical state. The accident took place around 3.30 a.m. on the Mehkar-Sultanpur stretch of the Aurangabad-Nagpur highway, around 300 km from here, when most passengers were sleeping.	Indo Asian News Service
Extreme Weather Events				
27.	09.01.2011	Cold wave claims over two dozen lives in UP 24 lives lost	The cold wave situation had worsened in Uttar Pradesh as the day's temperature further dropped. More than two dozen deaths were reported in the state during the past 24 hours. The state government ordered the closure of schools and colleges up to intermediate.	News on AIR
28.	10.01.2011	Cold wave toll mounting in UP 13 lives lost	Thirteen more people died due to severe cold conditions in different parts of Uttar Pradesh, taking the toll in the state this winter to 81. Cold wave conditions prevailed in most parts of the state and it was a foggy day in majority of areas. Weather was mainly dry in the state and night temperatures were markedly below normal.	DDI News
29.	17.02.2011	Bihar hail storm 11 lives lost	In Bihar, at least 11 people were killed and over two dozen were injured in the hail storm in the northern parts of the state. The hail storm lasted over half an hour and damaged a number of houses as well as the standing crops in the area.	News on AIR
30.	16.04.2011	Lightning killed people in Karnataka 19 lives lost	In Karnataka, at least 19 people died in lightning strikes and house collapses triggered by pre-monsoon rains in various parts of the State. While lightning claimed 14 lives, five persons died in house collapses due to heavy rains.	News on AIR
31.	16.04.2011	Rain claims lives in State 22 lives lost	Heavy rain lashed several parts of the State, claiming 22 lives. While some died after branches of trees fell on them, the majority — 16 people — died after being struck by lightning. Rain-related deaths were reported from Bangalore Rural, Ramanagaram, Hassan, Shimoga, Chamarajanagar, Haveri, Bellary, Bagalkot, Dharwad and Gadag districts. Three people were killed in Devanahalli taluk and there were reports of house collapse in other taluks of Bangalore Rural district. Two persons were killed in Ramanagaram and one in Udupi when their houses collapsed. As many as 35 houses were damaged in rain at Yembhatahalli in Bijapur district although no casualties were reported from here.	The Hindu
32.	18.05.2011	North India remains under grip of heat wave 13 lives lost	Thunderstorms killed 13 people in Uttar Pradesh as heat and humidity continued to wear down people in northern India where temperatures soared at several places but fell marginally in Delhi.	DD News

Brief of Other Disasters during 2011				
S. No.	Date	Disaster and Lives Lost and Injured	Damage Caused	Source
Extreme Weather Events				
33.	19.05.2011	Thunder, dust storms claim lives in Uttar Pradesh and Bihar 56 lives lost	At least 56 people were killed in Uttar Pradesh and Bihar when severe dust storm accompanying with rain and thundershowers lashed some parts of the states, according to All India Radio. In Uttar Pradesh, at least 30 people were killed in cyclonic storm that hit several districts of eastern UP.	TNN
34.	22.05.2011	Dust and thunder storm claim lives in UP and Bihar 73 lives lost	Dust and thunder storms have claimed 73 lives in Uttar Pradesh and Bihar. While 47 people were killed in Uttar Pradesh, 26 persons died in Bihar. In Uttar Pradesh, death toll in cyclonic storm has risen to 47.	News on AIR
35.	24.05.2011	Dust storm kills across U.P. 10 lives lost	Ten persons were killed in different parts of Uttar Pradesh due to dust storm in the past 24 hours. While three persons each were killed in Fatehpur and Ballia districts, two each died in Orai and Varanasi due to wall and tree collapses.	The Hindu
36.	06.06.2011	Monsoon claims lives in Kerala 23 lives lost	Heavy rains lashing many parts of Kerala have claimed 23 lives since the onset of southwest monsoon on 27th May, besides causing large-scale loss to crop and property. Most casualties, mainly due to drowning in swelling rivers and flash floods, were reported from Alappuzha and Kottayam districts.	DD News
37.	27.09.2011	Heavy rains leave in U.P. 28 lives lost	Heavy rains have wreaked havoc in eastern Uttar Pradesh leaving 28 people dead, while the water level in major rivers is rising. While 18 people were killed in incidents of wall and house collapse in Jaipur district, 10 deaths were reported from Mirzapur district.	The Hindu
Others				
38.	02.02.2011	Job aspirants killed after falling from trains 15 lives lost	15 youths were killed and several others injured when they fell from the roof of two speeding trains crammed with job aspirants returning from an ITBP recruitment camp in Bareilly in UP. Fourteen youths, travelling atop the Himgiri Express, were killed when they were hit by an overbridge near Shahjahanpur while another ITBP job-seeker died when he fell from the Triveni Express in Hardoi district. Agitated over the death of the youths, the job aspirants ran amok at Shahjahanpur station torching two bogies of the Jammu-Tawi Express and manhandling the driver of the Himgiri train. Over 12 ITBP aspirants were also injured some of them critically, in the accident. The death toll was expected to rise as some youths also fell into Khannaut river.	DDI News
39.	20.03.2011	Reang refugees killed in fire 16 lives lost	At least 16 Reang refugees were killed and nearly 100 injured, some of them critically, in a devastating fire that broke out in a cluster of make-shift camps at Naishingpara in North Tripura district. Unofficial sources put the death toll at 21. The fire, suspected to have been lit by some camp inmates to burn garbage, spread fast because of strong dusty winds and gutted 300 make-shift houses in the cluster.	The Hindu

Brief of Other Disasters during 2011				
S. No.	Date	Disaster and Lives Lost and Injured	Damage Caused	Source
Others				
40.	20.04.2011	Helicopter crashes in Tawang; DGCA orders probe 17 lives lost	A Pawan Hans helicopter crashed seconds before landing at Tawang in northwestern Arunachal Pradesh killing 17 persons on the spot and injuring six others grievously. There were 23 persons on board including five crew members. The Directorate General of Civil Aviation (DGCA) has reportedly ordered an inquiry into the crash. The MI-172 helicopter had taken off from Guwahati and was scheduled to land at the Tawang civil helipad at 2 pm. But it burst into flames seconds before touchdown	Hindustan Times
41.	24.05.2011	Boat capsizes in the Ganga 13 lives lost	13 persons were feared dead when a boat turned turtle while crossing the river Ganga near Manda Ghat Sangam in Allahabad. Bodies of eight of the boat passengers were fished out of the river by the local boatmen and divers. Search was underway for the missing passengers.	TNN
42.	21.06.2011	Mysterious disease in Bihar 22 lives lost	In an alarming outbreak of mild epidemic proportions, at least 22 children have died of an unknown seasonal disease in Bihar's Tirhut division, with the maximum number of deaths concentrated in and around the State's Muzaffarpur district. Almost all the cases have been reported among children under 10 years and belonging to the backward sections.	The Hindu
43.	23.06.2011	Mystery fever diagnosed as encephalitis, toll climbs 36 lives lost	The mystery fever that has gripped children in Bihar's Muzaffarpur district has been diagnosed as encephalitis even as the virus claimed three more lives, taking the toll to 36. A Central team, which had collected blood samples of the patients to ascertain the cause of the deaths, said that it was clinically diagnosed that the children were suffering from encephalitis.	DD News
44.	25.06.2011	Landslides in Sikkim 16 lives lost	Sixteen persons are reported to have died in landslides caused by heavy rain in West Sikkim. The landslides, which occurred around tourism hot spots in Sikkim, have damaged roads and destroyed at least four houses.	Hindustan Times
45.	10.07.2011	Delhi-bound train derails 35 lives lost 200 injured	At least 35 people were killed and over 200 injured when 15 bogies of a speeding Delhi-bound Kalka Mail derailed here today in the worst train accident this year. The derailment took place at 12.20 pm when the packed train from Howrah reached near Malwa station, nearly 120 kms. from Lucknow. While some of the bogies had toppled, others were turned into mangled heap of metal. The crowded general compartment behind the engine was the worst hit. Gas cutters and other equipment were used to cut through the metal in the AC and other coaches to rescue the trapped passengers. Locals, railway and district authorities immediately launched the rescue operation. The army had also sent about 120 personnel from adjoining Allahabad and Kanpur to assist them. A team of National Disaster Relief Force was also deployed.	The Times of India
46.	14.07.2011	Mumbai Blast 18 lives lost 131 injured	At least 18 people were confirmed dead while 131 were taken to hospitals with injuries after the Mumbai triple blasts. The 131 injured were admitted to 13 hospitals, of which 26 have been discharged, 82 were reportedly stable and 23 were seriously injured.	Hindustan Times

Brief of Other Disasters during 2011				
S. No.	Date	Disaster and Lives Lost and Injured	Damage Caused	Source
Others				
47.	14.07.2011	Terror strikes Mumbai again 21 lives lost 141 injured	Three blasts between 6.54 p.m. and 7.05 p.m. on Wednesday rocked the crowded areas of Mumbai, killing 21 persons and injuring 141 others. The most powerful one, suspected to have been set off by an IED (improvised explosive device), occurred at Zaveri Bazaar in south Mumbai, a congested part of the city; the second one at KabutarKhana near the Dadar suburban railway station in central Mumbai; and the third at Opera House, also in south Mumbai.	The Hindu
48.	16.08.2011	Dengue toll rises in Orissa 12 lives lost	The toll in the mosquito borne dengue disease rose to 12. Three deaths were reported from private hospitals in Cuttack and Bhubaneswar, while nine persons had earlier died due to dengue this season. While 10 of the dengue victims belonged to the worst affected Angul district, one deceased each hailed from Balangir and Dhenkanal districts. As many as 173 patients had so far been diagnosed to be suffering from dengue, which has spread its tentacles in 18 of the 30 districts of the state.	DD News
49.	14.09.2011	Train collision in Tamil Nadu 10 lives lost 70 injured	Eight carriages were derailed by the impact and 10 people were killed and more than 70 injured when a passenger train hit a stationary train near Arakkonam in Vellore district of Tamil Nadu. Eight coaches were derailed and three were completely damaged in the incident. A suburban train travelling between Chennai (Madras) Beach and Vellore collided into a stationary passenger train that was waiting for signal at the Chitheri station.	BBC News
50.	23.10.2011	Bridge collapse, Kolkata 27 lives lost 50 injured	At least 27 persons were killed and over 50 injured when a bridge over a river collapsed in the Bijonbari area of Darjeeling district. The wooden bridge, which had been weakened by the Sept. 18 earthquake, gave way as people were crossing it. The army was deployed for rescue operations.	The Hindu
51.	01.11.2011	Encephalitis claims lives in Maharajganj 40 lives lost	Forty children died due to encephalitis in Maharajganj district of UP in the last two months.	ddinews
52.	09.11.2011	Haridwar stampede 16 lives lost	At least 16 people, mostly women, were killed and several others injured in a stampede during a religious ceremony attended by tens of thousands of devotees near Har Ki Pauri in Haridwar. The stampede occurred when the devotees tried to enter the yajnasala at Chandidweep Ghat on the banks of Ganga for the centenary celebrations of Acharya Pt. Shriram Sharma, the founder of Shatikunj Ashram. It was due to suffocation in the area that led to the stampede but exact cause was awaited for inquiry. As the stampede broke out, the people ran helter-skelter with women and children falling on the ground.	ddinews
53.	21.11.2011	East Delhi fire 14 lives lost	40 InjuredAt least 14 persons died and 40 others suffered injuries when a major fire engulfed a congregation of eunuchs at a community centre in an East Delhi locality. The incident took place at around 7 pm at the community hall in Nand Nagri area where a three-day congregation of eunuchs was taking place. The fire first began in the kitchen of the community centre and thereafter spread to other parts of the hall.	ddinews

NIDM Activities 2011

1. International Training Programme on Comprehensive Disaster Risk Management for Officers of African Countries (January 10-21, 2011)

Training of Trainers Programme on Comprehensive Disaster Risk Management for Officials from African countries was organized during January 10-21 in collaboration with Haryana Institute of Public Administration (HIPA); at HIPA campus in Gurgaon under the “Africa India Framework”. Twenty five officials from 17 African countries participated in the programme.



INAUGURAL SESSION OF THE TRAINING OF THAINERS PROGRAMME ON COMPREHENSIV DISASTER RISK MAN-AGMENT FRO OFFICIAL FROM AFRICAN COUNITIRES

2. Blended Learning Course on Environmental Statistics and Disaster Management (January 27-28, 2011)

NIDM organised the ‘face-to-face’ (classroom) component of the captioned programme at NIDM on January 27-28 in collaboration with Ifanos-India and GTZ-Inwent.

3. NIDM-ITC-CEPT Training Workshop on Geo-informatics Applications in Chemical Risk Management (January 31– February 4, 2011)

NIDM in collaboration with UNU- ITC School for Disaster Geo-information Management, The Netherlands; Faculty of Geomatics and Space Applications, CEPT University and Joint Research Centre (JRC), Italy organized the programme from January 31 to February 4 at CEPT University, Ahmedabad. Twenty three participants from department of disaster management, factories & boilers/industrial safety, environment and S&T working in areas related to chemical disaster management attended the training workshop.



NIDM AND ITC TEAM ORGANIZING HANDS ON SESSIONS DURING THE TRAINING WORKSHOP

4. Annual Training Conference- 2011 (February 14-15, 2011)

The sixth Annual Training Conference (ATC- 2011) of NIDM was held on February 14-15 to review the training and capacity building activities in the country during 2010-11 and develop the training calendar for 2011-12. The Conference was inaugurated by Shri T. Nand Kumar, Honourable Member of the National Disaster Management Authority.



5. National Conference on Earthquake Risk Management Strategy in North East Guwahati (February 24-25, 2011)

NIDM, in collaboration with the National Disaster Management Authority, North Eastern Council and Government of Assam organized the programme on 24-25 February 2011.

6. Training programme on Chemical (Industrial) Disaster Management at MDC –SHE (7-11 March 2011)

NIDM teamed up with Multi Disciplinary Centre for Safety Health and Environment (The MDC on SHE) in organizing the programme at MDC –SHE Bhubaneswar during March 7-11. Seventeen participants from state disaster management authorities, factories department, district functionaries and industries participated in the training.

7. NIDM signs MoU with ISI (March 8, 2011)

The National Institute of Disaster Management (NIDM) New Delhi and the Indian Statistical Institute (ISI) Kolkata decided to work together for development of a robust statistical system on hazards, vulnerabilities and risks of disasters in the country. Under this arrangement, ISI would assist NIDM in studying the existing statistical system for the collection and analysis of data on natural and



manmade hazards and disasters and suggest methods for improving the system. A MoU to this effect was signed by Shri P. G. Dhar Chakrabarti the then Executive Director of NIDM with Professor Bimal Roy, Director of the ISI on March 8 in New Delhi.

8. Workshop on Landslide and related Disaster Management (March 8-10, 2011)

Joint Indo-Japanese International Training cum field workshop on “Landslides and related disasters” held from March 8 to 10 at Gangtok, in collaboration with National Institute for Land and Infrastructure Management (NILIM) and Public Work Research Institute (PWRI), Japan.

9. 2nd NIDM-UNSPIDER training Workshop on Space Technology Applications in DRR and Emergency Response (March 28-30, 2011)

The second NIDM – United Nations Platform for Space-based Information for Disaster Management and Emergency Response (UN-SPIDER) workshop was organized at NIDM from March 28-30. Twenty one officials from various states of India and four from

SAARC countries attended the workshop.



2ND NIDM-UNSPIDER TRAINING WORKSHOP

10. International Conference Environmental Knowledge for Disaster Risk Management (May 10-11, 2011)

The international conference on Environmental Knowledge for Disaster Risk Management (ekDRM-2011) was organised on May 10-11 at Vigyan Bhavan, New Delhi as a part of the cooperation of the National Institute for Disaster Management and the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH under the aegis of the Advisory Services in Environmental Management (ASEM) programme in India. The conference was inaugurated by Dr. Ajit Tyagi, Director General of India Meteorology Department. The conference was attended by 120 experts, researchers and practitioners from India, Germany and other countries.



DR. AJIT TYAGI, DIRECTOR GENERAL, IMD RELEASING THE PRECONFERENCE VOLUME ON ENVIRONMENTAL KNOWLEDGE FOR DISASTER MANAGEMENT DURING THE INAUGURAL SESSION OF THE CONFERENCE.

11. Representation of NIDM in the 3rd Session of Global Platform on Disaster Risk Reduction (May 8-13, 2011)

UN Secretary-General Ban ki-Moon opened the Third Session of the Global Platform for Disaster Risk Reduction (DRR) at Geneva during May 8-13, which was attended by approximately 3,000 participants, including representatives from over 170 governments, 20 ministers and 30 mayors, and 100 non-governmental organizations (NGOs). Indian delegation was led by Shri A.E. Ahmed, Secretary, Border Management, Ministry of Home Affairs, Government of India. Prof. Santosh Kumar from NIDM attended the third session of Global Platform.



3RD GLOBAL PLATFORM FOR DISASTER RISK REDUCTION

12. Representation of NIDM in 4th Trilateral Meeting at Russia (September 7-9, 2011)

The 4th Trilateral meeting of experts of India-Russia- China (IRC) in the field of disaster management was held at St. Petersburg, Russia during September 7-9. Indian delegation was led by Shri R. K. Srivastava, Jt. Secretary (DM), Ministry of Home Affairs, Government of India. Dr. Satendra, Executive Director NIDM attended this meeting as part of India delegation.

13. Second Training Programme on Comprehensive Disaster Management for Officials of African Countries (September 19-30, 2011)

NIDM organized the captioned programme from September 19-30 for the officials of African countries under Indo-African collaboration. Twenty five participants from



Dignitaries at the Inaugural Function; Shri Gurjit Singh, Additional Secretary (E & SA), Shri R. K. Srivastava, Joint Secretary (DM), MHA, Shri Lokesh Jha, Joint Secretary (PP), MHA and Dr. Satendra, Executive Director, NIDM

thirteen African countries participated in the programme.

14. Visit of NIDM's team to document Sikkim Earthquake (September 21-25, 2011)

National Institute of Disaster Management (NIDM) deputed Dr. Chandan Ghosh, Professor and Head and Dr. Surya Parkash, Associate Professor, Geo-hazards Division, to document the Mw6.8 Sikkim Earthquake. The team carried reconnaissance survey of the affected areas from September 21 to 25 and held interactions with officials from the State and Central Government Agencies, armed forces, communities, NGOs and civil societies involved in the relief and rescue operations. The team mainly noted the extent of damages incurred to buildings, roads and infrastructures; response mechanism and relief measures being adopted, emergency control room operation at the district head quarters, in addition to media and press briefing to tackle the situation on emergent basis.

15. NIDM conferred the title of "World Centre of Excellence on Landslide Risk Reduction" (October 3-7, 2011)

National Institute of Disaster Management (NIDM), New Delhi, India has been conferred the title of "World Centre of Excellence on Landslide Risk Reduction" by the International Consortium on Landslides (ICL) and Global Promotion Committee (GPC) of the International Programme on Landslides under International Strategy for Disaster Reduction (IPL-ISDR) during the 2nd World Landslide Forum held at FAO Headquarters, Rome, Italy between October 3 and 7. NIDM is now one amongst 15



NIDM CERTIFIED AS WCOES BY THE GPC OF IPL-ISDR AND ICL DURING THE 2ND WORLD LANDSLIDE FORUM

organizations/universities/institutes, which have been identified as WCoEs by the GPC of IPL-ISDR and ICL . This title of WCoE-LDR has been conferred for the period between 2011 and 2014.

16. NIDM Observed Disaster Reduction Day (October 12, 2011)

NIDM observed "Disaster Reduction Day" on October 12 at New Delhi. Various

activities, including competitions, seminar, debate, etc. were organised on DRR issues. in lines of International Day for Disaster Reduction, which is observed in October every year. Shri Mullappally Ramachandran, Hon'ble Minister of State for Home Affairs, was the Chief Guest of the function and Shri A. E. Ahmed was the Guest of Honour.



Shri A. E. Ahmed, Secretary to Government of India for Border Management addressing the dignitaries, delegates and students during the Disaster Reduction Day.

17. Launching of NIDM e-learning Self Study Programme (October 12, 2011)

NIDM with the technical support of C-DAC developed e-learning self study programme on disaster management and launched on October 12, on the occasion of Disaster Reduction Day. Details at <http://nidmssp.in>



HOME PAGE OF THE SELF LEARNING PORTAL LAUNCHED DURING DISASTER REDUCTION DAY

18. NIDM visit to USA under Professional Exchange Programme (November 13-19 2011)

Dr. Satendra, Executive Director of NIDM, visited various Institutes and Organizations in United States with Senior Management Personnel from the Disaster Management sector) under Professional Exchange Programme from November 13-19.



INDIAN DELEGATION IN FRONT OF FEMA OFFICE, USA.

19. NIDM Observed International Day of Persons with Disabilities (December 3, 2011)

National Institute of Disaster Management observed the International Day of People with Disabilities (IDPD) on December 2, at NIDM. The programme was attended by about fifty persons from different institutes and schools.

20. Training of Trainers Programme on Blended Learning (December 5-7, 2011)

NIDM in collaboration with German International Cooperation (GIZ) organized the



Dr. Muzaffar Ahmad, Honorable Member of National Disaster Management Authority, delivering valedictory address

Training of Trainers Workshop from December 5-7 at NIDM. Mr. Klaus Röder, Consultant, GIZ Germany trained the participants. Fifteen participants attended it.

21. Training Workshop on Ecosystem Based Disaster Risk Reduction (December 12-15, 2011)

National Institute of Disaster Management (NIDM) and the Partnership for Environment and Disaster Risk Reduction (PEDRR), United Nations jointly organized the programme from December 12-15 at NIDM, New Delhi.