



## CHAPTER - I

### Introduction

The geo-climatic conditions of Orissa induce occurrences of natural calamities like flood, cyclone, fire, hailstorm, drought, lightning, heat-wave, earthquake and tsunami. Flood, cyclone, hailstorm, fire and heat-wave are more frequent and intense bringing misery to the lives of people. The major rivers of the State like Mahanadi, Brahmani, Baitarani, Subarnarekha, Budhabalanga, Rushikulya, Vamsadhara and their tributaries cause major floods in the State. Being situated on the northern part of the east-coast, the State has very high vulnerability to be devastated by cyclone. Climatologically, it falls directly under the path of cyclone during movement over the Bay of Bengal. In active monsoon condition, depressions in the Bay of Bengal cause floods in the State. Many-a-time, the State also faces drought due to vagaries of monsoon. This apart, a high percentage of area of the State falls under the seismic vulnerability zone. Recurrent natural calamities have been a major stumbling block in the path of socio-economic development of the State. In the face of such daunting odds, people of Orissa have exhibited remarkable resilience.

#### Multiple Disasters

Orissa being situated on the eastern-coast of the Bay of Bengal is extremely vulnerable to multiple hazards. The table below indicates how the State has been devastated by natural calamities in last 15 successive years.

Year	Calamity	Districts Affected
1994	Floods	17
1995	Floods & Cyclone	23
1996	Drought	28
1997	Drought	16
1998	Drought	26
1999	Super Cyclone	14
2000	Drought	29
2001	Floods	24
2002	Drought	29



2003	Floods	23
2004	Floods	05
2005	Floods	15
2006	Floods	27
2007	Floods (July)	12
2007	Floods (Aug. & Sept.)	15
2008	Floods (June & Sept.)	21

The socio-economic vulnerability of people turns these hazards into disasters. With nearly 90% of population living in disaster-prone areas and about 66% below the poverty line, the coping mechanism of the State and its people is constantly under severe strain. Although several initiatives have been taken to prepare the community to battle against natural calamities, there is hardly any time left to complete the process. The frequency and the gravity of the disasters provide little scope to reap the benefits of these initiatives. The focus of the State keeps shifting between repair/reconstruction and preparedness on the one hand and relief and rehabilitation on the other.

The analysis of history of natural calamities illustrates that Orissa has been a regular victim of flood, cyclone and drought almost in every alternative year.

Extreme rainstorms causing unprecedented flood situation in the major river basins of the State indicate an erratic geo-climatic condition. Atmospheric scientists all over the world agree that extreme rain events and shifting of seasons would become more common on a warmer planet. The computer simulation also endorses the hypothesis. The study taken up by the Indian Institute of Tropical Meteorology indicates that the rise in temperature would be far more in northern India than the peninsular part. Global modelling suggests that precipitation in the country may be about 8-10% more than the annual average. But the real problem will be in sharp rise in intensity of precipitation in a short span of time which will be critical to India's food production and disaster scenario. The global warming and climate change is a reality which needs to be accepted in the light of the changed weather pattern and extreme weather events leading to



catastrophic conditions like floods and water logging. In view of this, new approaches in management of disasters need to be incorporated to reduce the human misery.

## River System

The river system of Orissa comprises of the river Mahanadi, Brahmani, Baitarani, Subarnarekha, Vansadhara, Budhabalanga, Rusikulya, Nagabali, Indravati, Kolab, Bahuda, Jambhira and other tributaries and distributaries.



### Mahanadi River System

The Mahanadi is the biggest river in Orissa and is the 6<sup>th</sup> biggest river in the country.

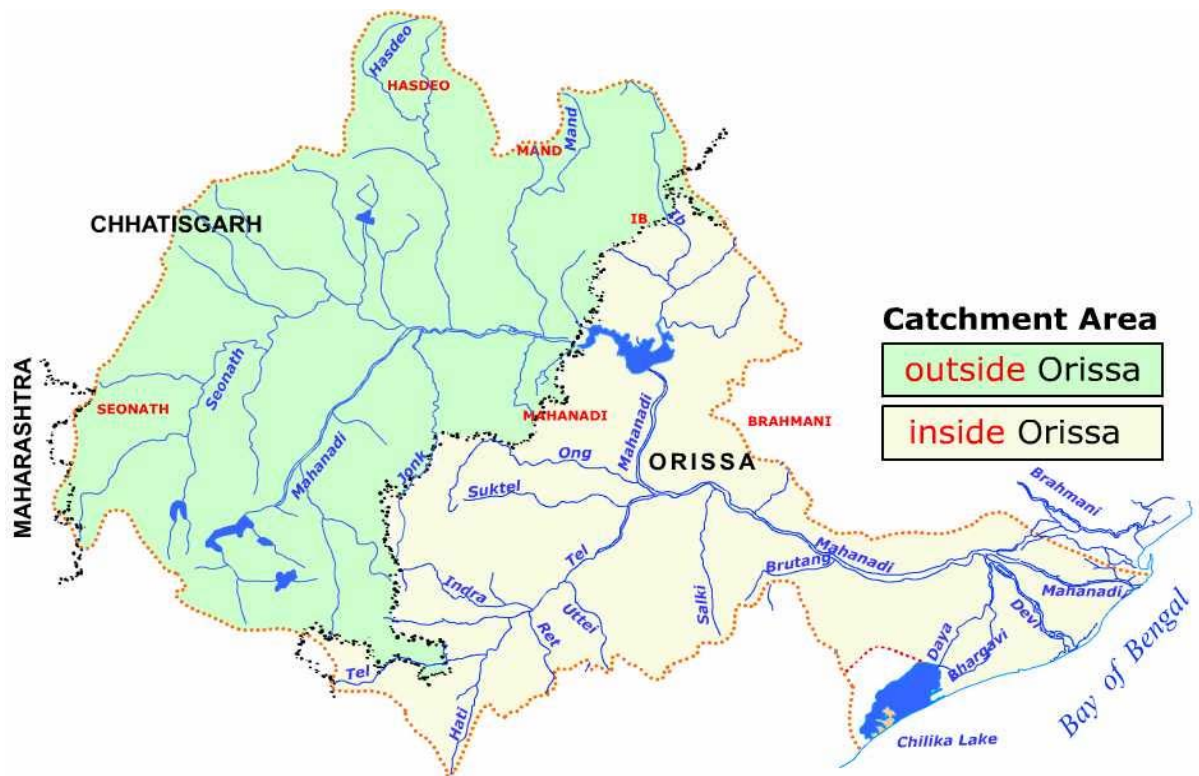
The river Mahanadi in its onward journey from erosional plains bifurcates into a number of branches and sub-branches, forming the Mahanadi delta, covering an area of 9063 sq. km before falling into the Bay of Bengal. The major branches and sub-branches of river Mahanadi are the Kathjori, the Birupa, the Kuakhai, the Kushabhadra, the Bhargavi, the Daya, the Sirua, the Biluakhai, the Devi, the Chitrotpala, the Luna, the Karandia,



the Paika and the Badagenguti. The Daya and the Bhargavi fall into the Chilika Lake while the other branches and sub- branches of river Mahanadi fall into the Bay of Bengal.

Mahanadi being the largest river in the State covers catchment of area of 1,41,600 sq.km. The basin of Mahanadi covers 65,628 Sq.km, i.e. about 42% of the total geographical area of the State. The Mahanadi, a major east flowing river of the peninsular river system, originates near Pharasiya village of Rainpur district of Chhatishgarh State. This drains an area of 1,41,600 sq. km and has a length of 851 km. The major tributaries of river Mahanadi in Orissa are Ib, Ong, Tel, Suktel, Jira etc. Major branches of river Mahanadi are Kathajori, Birupa, Kuakhai, Devi, Luna etc.

Hirakud Dam constructed in 1957 across Mahanadi in Sambalpur District with a reservoir spread over 746 sq. km and live storage capacity of  $5.37 \times 10^9$  cum, acts as the lone structure to moderate the downstream floods. The Hirakud Dam across Mahanadi near Sambalpur drains an area of 83400 Sq.Km.





The total length of protective embankments provided in all river basins is 6515 Km out of which Puri, Kendrapara, Cuttack and Jagatsinghpur districts are having embankments of 1133 Km, 1033 Km, 713 Km and 597 Km respectively. There are 1952 spurs and 253 Km of stone packing in embankment of the river system.

The details of the river embankments are as follows:

#### River Embankments

Sl. No.	Name of the river system	Capital Embankment (C.E.)	Other Agricultural Embankment (O.A.E.)	Test Relief Embankment (T.R.E.)	Saline Embankment	Total
1	Vamsadhara	4.98	1.70	82.91		89.59
2	Rushikulya		486.46		30.00	516.46
3	Mahanadi	1281.10	1205.78	428.69	961.72	3877.29
4	Brahmani	144.21	218.67	258.35	323.20	944.43
5	Baitarani	127.87	122.13	184.54	161.80	596.34
6	Burhabalanga		20.50	144.85	12.95	178.30
7	Subernarekha	30.00	28.70	225.60	28.00	312.30
	Total	1588.16	2083.94	1324.94	1517.67	6514.71

#### History of High Floods

In the past, floods have brought havoc in different parts of the State many times. Out of these, the Mahanadi basin has experienced high floods in 1982, 2001, 2003, 2006 and this year 2008. Details of high floods are given below.

Year	Month	Duration (In Days)	Peak Discharge at Naraj (in lakh cusecs)
1958	July	13	12.00
1959	September	9	12.55
1961	July	10	12.85
1980	September	12	12.07
1982	August	6	15.84



1991	August	10	12.71
2001	July	19	14.09
2003	Aug/Sept.	19	13.50
2006	August	12	12.83
2008	September	15	15.82

## Rainfall-2008

During June, July, August and September ten low-pressure areas formed over North West Bay of Bengal adjoining to Orissa coast. This was quite unexpected and the rainfall during June and September were much more than the normal in many districts. Even more than 300 to 400 mm rainfall was recorded at a few places causing unprecedented damage to lives and properties. The district-wise annual rainfall from January to December with deviation is given in the table below. The graphical representations of rainfall (District-wise, Month-wise and Deviation) during the year 2008 are at *Fig. 1.1, 1.2 & 1.3* respectively.

### District-wise rainfall for the year 2008

Sl.	DISTRICT	JAN.			FEB.			MAR.			APRIL.		
		Actual	Normal	% of Dev.	Actual	Normal	% of Dev.	Actual	Normal	% of Dev.	Actual	Normal	% of Dev.
1	Angul	53.7	12.6	326.2	4.0	27.1	-85.4	4.1	24.3	-83.0	31.1	27.2	14.2
2	Balasore	67.2	14.7	356.9	18.1	31.8	-43.1	3.8	34.4	-89.1	22.7	62.2	-63.6
3	Bargarh	0.0	12.5	-100.0	0.0	19.1	-100.0	0.0	22.0	-100.0	0.0	20.0	-100.0
4	Bhadrak	30.4	11.8	157.9	2.9	29.6	-90.3	9.8	36.1	-72.7	39.0	51.2	-23.8
5	Bolangir	8.8	8.6	2.7	11.9	13.2	-10.0	8.6	14.6	-41.3	22.4	13.4	66.8
6	Boudh	51.3	17.0	202.0	3.0	26.8	-88.8	4.7	22.4	-79.2	18.7	16.5	13.1
7	Cuttack	32.8	9.9	231.8	9.9	28.6	-65.3	25.1	24.7	1.5	61.9	28.3	118.8
8	Deogarh	37.7	14.1	167.6	10.0	27.0	-63.1	0.0	20.6	-100.0	14.9	21.3	-30.0
9	Dhenkanal	73.0	10.5	595.2	4.0	21.9	-81.7	8.5	33.7	-74.7	16.7	41.3	-59.5
10	Gajapati	31.7	8.1	291.6	36.6	23.0	59.3	70.5	41.3	70.6	33.1	65.2	-49.2
11	Ganjam	3.8	9.4	-59.9	11.6	24.1	-51.7	21.5	32.6	-34.0	19.4	36.6	-47.1



*Annual Report 2008-09*

12	Jagatsinghpur	11.0	14.5	-24.1	26.1	21.7	20.4	1.6	35.5	-95.4	127.6	25.4	402.5
13	Jajpur	27.7	12.9	114.7	4.8	25.1	-80.9	14.0	28.4	-50.7	30.1	46.1	-34.7
14	Jharsuguda	42.8	14.1	203.5	28.6	22.9	24.9	3.2	17.6	-81.8	8.2	15.1	-45.7
15	Kalahandi	21.7	10.3	110.5	2.5	14.4	-82.4	2.6	23.7	-89.2	1.5	25.7	-94.0
16	Kandhamal	58.3	10.6	450.0	8.9	29.7	-70.2	38.5	28.0	37.4	58.3	35.7	63.3
17	Kendrapara	31.4	10.6	196.6	14.9	30.2	-50.7	5.0	35.0	-85.7	78.9	33.9	132.7
18	Keonjhar	60.3	14.6	312.8	0.6	33.8	-98.2	2.8	33.1	-91.6	23.9	42.1	-43.2
19	Khordha	18.2	12.4	46.8	34.9	24.3	43.6	16.9	22.1	-23.5	46.6	28.0	66.4
20	Koraput	0.0	5.7	-100.0	0.6	8.6	-93.4	44.0	18.3	140.6	18.4	55.2	-66.7
21	Malkangiri	0.0	2.7	-100.0	0.0	4.1	-100.0	0.0	8.9	-100.0	9.0	34.8	-74.1
22	Mayurbhanj	51.7	10.3	402.2	0.9	28.0	-96.8	25.4	40.2	-36.9	42.3	52.5	-19.5
23	Nawarangpur	8.4	6.7	25.4	28.7	14.1	103.8	34.1	15.1	125.8	34.8	34.1	2.1
24	Nayagarh	14.5	11.7	23.5	6.6	28.6	-76.9	15.0	30.0	-50.2	43.8	39.9	9.8
25	Nuapara	10.7	12.0	-10.5	2.5	14.6	-82.7	0.0	19.7	-100.0	8.8	21.8	-59.4
26	Puri	24.1	10.9	121.2	16.9	25.4	-33.4	3.5	15.5	-77.1	66.0	18.5	257.0
27	Rayagada	2.5	9.6	-74.1	12.6	22.9	-45.2	60.6	38.0	59.4	35.0	52.7	-33.6
28	Sambalpur	35.6	14.8	140.5	14.5	24.5	-40.8	7.5	18.2	-58.6	8.5	16.5	-48.6
29	Sonepur	16.5	12.5	32.0	10.3	17.2	-39.9	2.7	15.7	-83.0	14.3	15.4	-6.9
30	Sundargarh	8.6	15.1	-43.0	1.6	24.9	-93.4	4.8	16.0	-70.2	8.5	16.0	-47.1
<b>Total</b>		<b>834.5</b>			<b>328.6</b>			<b>438.6</b>			<b>944.4</b>		
<b>State Average</b>		<b>27.8</b>	<b>11.4</b>	<b>144.0</b>	<b>11.0</b>	<b>22.9</b>	<b>-52.2</b>	<b>14.6</b>	<b>25.5</b>	<b>-42.7</b>	<b>31.5</b>	<b>33.1</b>	<b>-4.9</b>

Contd..

Sl.	DISTRICT	MAY			JUNE			JULY			AUGUST		
		Actual	Normal	% of Dev.	Actual	Normal	% of Dev.	Actual	Normal	% of Dev.	Actual	Normal	% of Dev.
1	Angul	36.0	52.9	-31.9	371.4	225.1	65.0	269.9	347.7	-22.4	283.5	357.5	-20.7
2	Balasore	98.4	108.5	-9.3	630.8	221.5	184.8	263.5	308.6	-14.6	286.7	332.1	-13.7
3	Bargarh	0.0	25.6	-100.0	271.3	205.6	31.9	303.9	397.2	-23.5	410.8	374.4	9.7
4	Bhadrak	54.3	91.4	-40.6	444.5	198.2	124.3	145.4	293.6	-50.5	213.8	311.7	-31.4



Annual Report 2008-09

5	Bolangir	1.9	27.8	-93.3	267.7	202.8	32.0	335.4	360.5	-7.0	505.1	333.6	51.4
6	Boudh	0.0	38.4	-100.0	366.2	233.8	56.6	306.9	418.5	-26.7	407.3	488.8	-16.7
7	Cuttack	78.0	71.5	9.1	413.9	210.0	97.1	280.2	308.3	-9.1	428.4	339.1	26.3
8	Deogarh	23.9	41.9	-42.9	372.0	242.4	53.5	342.3	447.7	-23.5	322.1	443.4	-27.3
9	Dhenkanal	56.8	69.6	-18.5	301.7	225.7	33.7	275.0	317.9	-13.5	346.9	344.8	0.6
10	Gajapati	97.8	107.8	-9.3	97.4	199.7	-51.2	267.3	230.6	15.9	322.5	253.6	27.2
11	Ganjam	61.9	65.4	-5.4	192.3	168.3	14.3	225.6	220.8	2.2	275.0	246.8	11.4
12	Jagatsinghpur	63.4	78.0	-18.8	347.4	202.3	71.7	253.5	277.3	-8.6	417.3	379.1	10.1
13	Jajpur	68.2	93.7	-27.2	423.0	238.5	77.4	150.8	350.9	-57.0	245.8	341.2	-28.0
14	Jharsuguda	3.0	27.9	-89.2	281.4	218.8	28.6	440.6	385.8	14.2	489.8	382.9	27.9
15	Kalahandi	0.0	41.8	-100.0	348.9	240.4	45.1	304.2	327.7	-7.2	733.7	355.4	106.4
16	Kandhamal	25.6	67.8	-62.3	225.7	207.9	8.5	238.9	325.1	-26.5	433.0	330.8	30.9
17	Kendrapara	83.6	94.2	-11.2	431.0	208.3	106.9	176.0	317.1	-44.5	253.1	333.3	-24.1
18	Keonjhar	70.1	94.8	-26.0	545.4	241.4	125.9	332.4	318.0	4.5	268.0	343.6	-22.0
19	Khordha	41.5	60.7	-31.6	317.8	196.2	62.0	293.1	304.9	-3.9	302.7	320.6	-5.6
20	Koraput	17.6	81.9	-78.5	197.6	206.8	-4.5	229.4	375.6	-38.9	427.3	393.6	8.5
21	Malkangiri	4.2	49.1	-91.5	280.8	212.2	32.3	477.9	465.7	2.6	396.3	472.8	-16.2
22	Mayurbhanj	97.2	101.2	-4.0	666.8	265.8	150.9	295.1	337.3	-12.5	278.8	359.9	-22.5
23	Nawarangpur	39.4	66.1	-40.4	283.4	251.8	12.5	365.4	356.6	2.5	635.1	407.5	55.9
24	Nayagarh	43.1	58.8	-26.8	293.8	203.5	44.4	329.0	288.5	14.0	334.7	288.2	16.1
25	Nuapara	0.0	31.2	-100.0	168.8	210.3	-19.7	193.7	347.1	-44.2	349.2	327.8	6.5
26	Puri	22.4	62.1	-63.9	298.6	188.0	58.8	334.3	292.0	14.5	311.8	297.9	4.7
27	Rayagada	19.4	87.8	-77.9	156.1	195.3	-20.1	215.7	259.5	-16.9	381.8	273.7	39.5
28	Sambalpur	11.5	32.3	-64.4	410.6	221.0	85.8	494.5	429.5	15.1	505.0	442.4	14.2
29	Sonepur	0.0	29.3	-100.0	353.2	217.4	62.5	361.8	399.6	-9.5	377.3	408.9	-7.7
30	Sundargarh	12.9	40.6	-68.1	392.6	237.4	65.4	423.6	386.4	9.6	379.5	393.9	-3.7
Total		1132.0			10151.8			8925.3			11322.2		
State Average		37.7	63.3	-40.4	338.4	216.5	56.3	297.5	339.9	-12.5	377.4	356.0	6.0

Contd..





Sl.	DISTRICT	SEPTEMBER			OCTOBER			NOVEMBER			DECEMBER			ANNUAL [Jan. to Dec.]		
		Actual	Normal	% of Dev.	Actual	Normal	% of Dev.	Actual	Normal	% of Dev.	Actual	Normal	% of Dev.	Actual	Normal	% of Dev.
1	Angul	348.5	217.5	60.2	19.8	86.3	-77.1	0.2	20.4	-99.3	0.0	3.3	-100.0	1422.1	1401.9	1.4
2	Balasore	299.5	267.6	11.9	10.3	170.5	-94.0	0.0	34.6	-100.0	0.0	5.5	-100.0	1700.8	1592.0	6.8
3	Bargarh	310.9	222.6	39.7	0.2	52.8	-99.7	0.0	10.4	-100.0	0.0	5.1	-100.0	1297.1	1367.3	-5.1
4	Bhadrak	323.5	216.8	49.2	21.7	145.3	-85.1	0.0	37.3	-100.0	0.0	4.9	-100.0	1285.4	1427.9	-10.0
5	Bolangir	472.5	237.4	99.0	6.7	68.4	-90.2	0.0	7.2	-100.0	0.0	2.3	-100.0	1640.8	1289.8	27.2
6	Boudh	350.2	244.8	43.0	17.0	90.5	-81.2	0.0	21.1	-100.0	0.0	4.4	-100.0	1525.2	1623.1	-6.0
7	Cuttack	495.8	229.2	116.3	26.7	125.6	-78.7	0.3	45.0	-99.3	0.0	4.1	-100.0	1853.1	1424.3	30.1
8	Deogarh	213.8	228.2	-6.3	9.2	84.4	-89.1	0.7	8.0	-90.8	0.0	3.5	-100.0	1346.6	1582.5	-14.9
9	Dhenkanal	327.8	220.6	48.6	18.3	104.4	-82.5	0.0	36.2	-100.0	0.0	2.2	-100.0	1428.6	1428.8	0.0
10	Gajapati	293.9	237.9	23.5	26.1	168.6	-84.5	2.4	61.8	-96.2	0.0	5.7	-100.0	1279.2	1403.3	-8.8
11	Ganjam	303.4	216.3	40.3	27.5	177.7	-84.5	19.9	71.1	-72.0	0.0	7.1	-100.0	1162.0	1276.2	-8.9
12	Jagatsinghpur	372.0	241.4	54.1	68.6	151.1	-54.6	0.0	80.4	-100.0	0.0	7.9	-100.0	1688.5	1514.6	11.5
13	Jajpur	491.6	238.0	106.6	13.2	140.2	-90.6	0.0	41.0	-100.0	0.0	3.9	-100.0	1469.2	1559.9	-5.8
14	Jharsuguda	352.4	210.7	67.3	3.6	54.9	-93.4	0.0	7.7	-100.0	0.0	4.4	-100.0	1653.6	1362.8	21.3
15	Kalahandi	455.4	204.6	122.6	14.9	74.0	-79.8	0.0	10.9	-100.0	0.0	1.6	-100.0	1885.4	1330.5	41.7
16	Kandhamal	550.7	239.1	130.3	47.0	117.7	-60.1	1.3	31.0	-95.9	0.0	4.5	-100.0	1686.1	1427.9	18.1
17	Kendrapara	510.0	237.3	114.9	75.0	183.7	-59.2	0.0	67.2	-100.0	0.0	5.2	-100.0	1659.0	1556.0	6.6
18	Keonjhar	332.7	241.1	38.0	10.1	101.3	-90.0	1.5	20.5	-92.5	0.0	3.4	-100.0	1647.8	1487.7	10.8
19	Khordha	332.6	234.5	41.8	29.1	149.3	-80.5	14.0	50.4	-72.2	0.0	5.0	-100.0	1447.4	1408.4	2.8
20	Koraput	313.0	256.3	22.1	48.3	126.1	-61.7	2.6	32.6	-92.0	0.0	6.5	-100.0	1298.7	1567.2	-17.1
21	Malkanagiri	157.9	281.2	-43.8	23.7	109.5	-78.4	0.0	23.6	-100.0	0.0	3.0	-100.0	1349.8	1667.6	-19.1
22	Mayurbhanj	281.0	262.0	7.3	20.2	114.1	-82.3	3.6	21.6	-83.4	0.0	7.3	-100.0	1762.9	1600.6	10.1
23	Nawarangpur	382.5	225.6	69.6	26.4	168.6	-84.4	0.0	18.7	-100.0	0.0	4.6	-100.0	1838.2	1569.5	17.1
24	Nayagarh	414.9	226.8	82.9	0.1	134.5	-99.9	2.1	39.0	-94.6	0.0	4.8	-100.0	1497.5	1354.3	10.6
25	Nuapara	563.8	214.5	162.9	14.9	68.9	-78.3	0.0	15.3	-100.0	0.0	3.2	-100.0	1312.5	1286.4	2.0
26	Puri	267.4	243.2	9.9	48.6	181.6	-73.2	25.9	67.3	-61.5	0.0	6.4	-100.0	1419.7	1408.8	0.8
27	Rayagada	375.0	199.1	88.4	26.9	109.7	-75.5	0.1	32.9	-99.7	0.0	4.7	-100.0	1285.6	1285.9	0.0
28	Sambalpur	374.9	224.7	66.8	16.3	54.7	-70.2	0.1	12.7	-99.1	0.0	4.4	-100.0	1879.1	1495.7	25.6
29	Sonepur	348.3	228.0	52.8	4.3	59.8	-92.8	0.0	11.4	-100.0	0.0	3.3	-100.0	1488.8	1418.5	5.0
30	Sundargarh	249.0	211.5	17.7	15.1	67.7	-77.7	0.0	8.7	-100.0	0.0	4.2	-100.0	1496.2	1422.4	5.2
	<b>Total</b>	<b>10865.0</b>			<b>689.8</b>			<b>74.7</b>			<b>0.0</b>			<b>45706.8</b>		
	<b>State Average</b>	<b>362.2</b>	<b>231.9</b>	<b>56.2</b>	<b>23.0</b>	<b>114.7</b>	<b>-80.0</b>	<b>2.5</b>	<b>31.5</b>	<b>-92.1</b>	<b>0.0</b>	<b>4.5</b>	<b>-100.0</b>	<b>1523.6</b>	<b>1451.2</b>	<b>5.0</b>

⌘⌘⌘



## CHAPTER - II

### Floods - 2008

The State of Orissa was ravaged by floods in June and September, 2008. The floods occurred in June and September 2008 were unprecedented and were calamity of severe nature. The water level recorded in the Subarnarekha exceeded all past records. The floods in June 2008 brought havoc in Balasore, Bhadrak, Jajpur, Mayurbhanj and Keonjhar Districts. When there was hardly any breathing gap, the State again experienced another devastating flood in the Mahanadi River System in September 2008.

The flood in September 2008 was due to heavy rainfall in the upper as well as in lower catchments of the Mahanadi River System resulting out of the effect of a deep depression in the Bay of Bengal from 16<sup>th</sup> to 21<sup>st</sup> September 2008. The magnitude and severity of the flood in this system had even surpassed the ferocities of 1982 and 2001 floods which were known to be highest floods in the system. During September, 19 districts namely, Angul, Bargarh, Bhadrak, Bolangir, Boudh, Cuttack, Gajapati, Jagatsinghpur, Jajpur, Kalahandi, Kendrapara, Keonjhar, Khurda, Nayagarh, Puri, Rayagada, Sambalpur, Nuapara and Subarnapur had been seriously affected. In total, the number of affected Districts comes to 21. Also other rivers like Baitarani, Vamsadhara were in spate during August 2008 affecting a few districts.

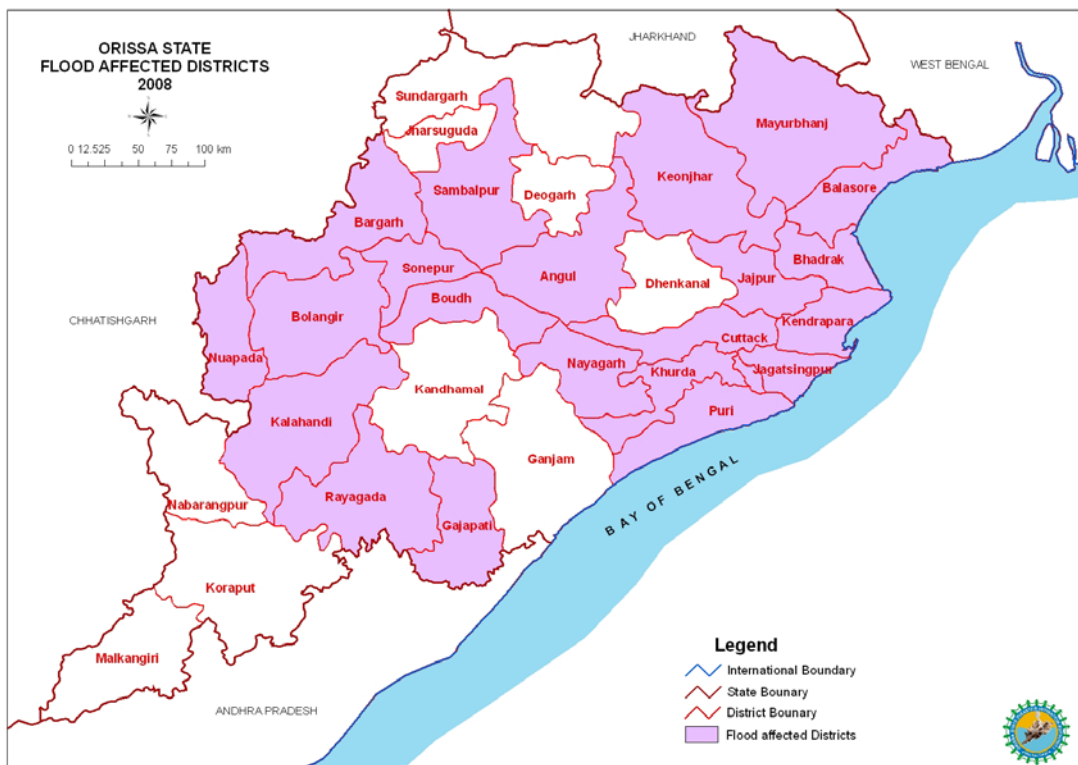
The Ministry of Home Affairs, Government of India had termed the floods of September'08 as "**Unprecedented Flood Situation**" on 20<sup>th</sup> September 2008, vide their letter No.11011 / 2008 MHA-DM-I Dt.20.09.08.

The floods cause extensive damage to natural resources, physical infrastructure and livelihood. It has adverse impact on the social fabric of the flood-affected areas. The resilience of the affected people was put to test and it would take years to recover from the losses sustained and trauma undergone. The September floods of 2008 carrying 15.822 lakh cusecs of floodwater resulted only from the contributions of downstream catchments and nil contribution from the Hirakud Dam. The contribution of tributaries in the downstream of the Hirakud Dam became hazardous and caused high



floods. In the last 51 years from 1958 to 2008, high floods above 10 lakh cusecs have occurred on 19 occasions, out of which only on 3 occasions the floods were due to Hirakud Dam release and on rest 16 occasions the floods (including 2008 floods) were due to the contribution from the downstream catchments.

The map given below indicates the Districts affected by floods 2008.



## Cause & Occurrence

### June 2008 Floods

#### IMD Forecast / Satellite Imagery

- i) On 16<sup>th</sup> June at 08.30 Hours, a depression formed over North Bay of Bengal about 300 km off Balasore. The system was moving in a North-Westerly direction.
- ii) On 17<sup>th</sup> June, this depression lay centred at 08.30 Hours at about 80 kms North North East of Kolkata.



Under its influence, the monsoon became vigorous and North Orissa received heavy to very heavy rainfall during the period from 15.06.08 to 19.06.08. The river Subarnarekha, Jalaka, Burhabalanga and Baitarani were flooded. The rainfall exceeded 200 mm at many places and peak rainfall of 597.08 mm was recorded at Fekoghat, which resulted in unprecedented floods in river Subarnarekha. The floodwater touched 12.69 m at Rajghat against danger level of 10.36 m while the previous recorded highest level was 12.38 m on 07.07.2007. The water level in Subarnarekha stayed over the danger level for about 88 hours from 17.06.08 to 21.06.08. It constantly passed over Mayurbhanaj and Balasore Districts causing inundation. Similarly, the river Jalaka, Burhabalanga and Baitarani basin also experienced heavy floods. The peak rainfall data and river gauge data are furnished below.

(Rainfall in mm)

Name of river basin	Sl. No.	Name of Station	16.06.08	17.06.08	18.06.08
Subarnarekha	1.	Bhograi	48.0	185.0	115.0
	2.	Fekoghat	125.0	93.40	597.8
	3.	Jaleswar	38.0	249.0	288.0
	4.	Rajghat	76.4	248.6	280.6
	5.	Rairangpur			319.0
Burhabalanga	1.	Balasore	107.4	213.6	132.8
	2.	Balimundali	90.4	116.4	145.4
	3.	Baripada	111.2	136.0	245.2
	4.	Jaypur	119.6	119.8	101.4
	5.	NH5, Govindpur	146.2	138.0	94.4
Baitarani	1.	Champua	0.2	80.2	160.2
	2.	Ghatagaon	23.4	82.8	123.2
	3.	Jhumpura	0.0	67.2	173.5
	4.	Joshipur	0.0	172.0	191.2
	5.	Karanjia	0.0	106.0	192.0



### River Gauge Position

River	Period	Peak Gauge	Date/Time	Highest Recorded Level
Subarnarekha river at Rajghat (D.L-10.36 m)	15.06.08 to 21.06.08	12.69 mtr.	19.06.08/0400 hrs.	12.69 m. / 19.06.2008
Baitarani river at Anandapur (D.L - 38.36 m)	17.06.08 to 19.06.08	40.18 mtr.	18.06.08/1300 hrs	41.80 m./ 19.08.75
Baitarani river at Akhuapada (D.L. - 17.83 m)	15.06.08 to 21.06.08	19.63 mtr.	19.06.08/0200 hrs.	21.95 m. / 16.08.1960

## September 2008 floods

### IMD Forecast/Satellite Imagery

- i) On 16.09.2008 at 1230 Hours, IMD informed that the depression over North West Bay of Bengal moved in North Westerly direction and intensified into a deep depression over the same area and was laying centred at about 130 km South-East of Chandabali and the System was likely to intensify further and move in a West North Westerly direction and cross Orissa coast near Chandbali by 16/9/2008 afternoon/ evening.
- ii) The depression moved West North Westerly and laid centred over North Orissa near Keonjhar at 08.30 Hours on 17.09.2008.
- iii) The deep depression over North Orissa near Jharsuguda moved West North Westwards and laid centered at 08.30 hours on 18.09.2008 over North Chhatisgarh.

Under influence of deep depression, the Districts along with the Mahanadi River System received heavy to very heavy rains.

A cyclonic storm vigorously activated the monsoon and torrential rains lashed the western, southern and coastal Orissa from 15.09.2008 to



18.09.2008. The deep depression formed on 16.09.2008 over the Bay of Bengal moved in a North Westerly direction from Chandbali towards Keonjhar and Jharsuguda from 16.09.2008 to 18.09.2008 and thereafter crossed over Orissa and entered Chhatisgarh causing heavy rainfall over Mahanadi, Brahamni, Baitarani, Rushikulya and Vamsadhara river basins.

River Tel, Suktel, Ong and other tributaries in the downstream of Hirakud Dam experienced heavy rainfall.

During the period from 15.09.2008 to 18.09.2008 rainfall of 200 mm and more were recorded. Some of the peak rainfall data, basin-wise, are furnished below.

Name of River Basin	Sl. No.	Name of Station	16.09.08	17.09.08	18.09.08
Mahanadi (Up stream of Hirakud)	1.	Deogaon	6.0	28.6	150.8
	2.	Jamadapalli	24.8	37.0	229.6
	3.	Parmanpur	6.8	28.8	236.0
Mahanadi (Down stream of Hirakud)	1.	Bolangir	34.0	185.2	204.0
	2.	Bhawanipatna	48.0	172.0	132.0
	3.	Baliguda	18.0	241.0	186.0
	4.	Kantamal	22.0	100.0	259.0
	5.	Kesinga	12.6	114.0	233.0
	6.	M. Rampur	112.0	200.0	200.0
	7.	Patnagarh	0.0	118.8	270.0
	8.	Tikabali	43.0	212.0	182.0
	9.	Titilagarh	3.4	128.2	250.8
Upper Brahamni	1.	Pallahara	51.0	35.0	130.0
	2.	Ramala	21.0	48.5	131.0
Lower Brahamni	1.	Telkoi	98.0	42.0	100.0
	2.	Jenapur	59.8	300.4	15.4
Baitarani	1.	Rajkanika	66.0	230.0	4.0
	2.	Akhupada	38.2	314.8	10.4
Rushikulya	1.	Daringbadi	39.0	191.0	105.0
	2.	Bhanjanagar	24.0	85.0	32.0
Vamsadhara	1.	Kotragarh	46.6	154.0	233.0
	2.	Kutragarah	69.6	71.2	115.4



### Weighted average rainfall in Mahanadi basin

	16.09.08	17.09.08	18.09.08	19.09.08
U/S of Hirakud Dam. Average Rainfall in mm.	7.92	12.20	63.20	57.00
D/S of Hirakud Dam. Average Rainfall in mm.	16.37	108.60	153.00	16.00

### River Gauge Data

The tributaries and branches of Mahanadi and other rivers experienced high floods during this period which can well be judged from the river gauge readings furnished below.

Name of River	Period	Peak Gauge	Date/Time	Highest Recorded Level
Baitarani river at Akhuapada (D.L. - 17.83 m)	17.09.08 to 19.08.08	18.84 mtr.	18.09.08/1600 hrs.	21.95 m. / 16.08.1960
Rushikulya river Purushottampur (D.L - 16.835 m)	18.09.08	16.85 mtr.	18.09.08/1200 hrs.	19.60 m. / 04.11.1990
Vamsadhara river at Kashinagar (D.L - 54.60 m)	17.09.08 to 19.09.08	56.60 mtr.	18.09.08/0400 hrs.	58.93 m. / 18.09.1980
Mahanadi / Naraj I.B - 26.41 m.	18.09.08to 23.09.08	27.18 mtr.	20.09.08/1200 hrs	27.60 m./ 31.08.82
Devi river at Alipingal D.L. - 11.76 m.	19.09.08 to 23.09.08	13.05 mtr.	20.09.08/0500 hrs	13.05 mtr./ 20.09.08
Kushabhadra river at Nimapara D.L - 10.76 mtr.	19.08.08 to 22.08.08	11.40 mtr.	20.09.08/0800 hrs	11.60 mtr./ 31.08.82

About two third area of Mahanadi delta remained inundated for more than a fortnight causing severe inconvenience and great hardship to public.



### Water Levels of Rivers

Due to heavy rainfall from 18<sup>th</sup> September 2008 to 20<sup>th</sup> September 2008, the water level had risen in the river Mahanadi, Brahmani, Baitarani, Budhabalanga, Kushabhadra, Devi for which floods occurred in these rivers affecting the downstream areas of the districts. The water level of different rivers is given below:

River	Forecast Station	Danger Level	Warning Level	Water Level in Mtrs			
				18 <sup>th</sup> Sept.	19 <sup>th</sup> Sept.	20 <sup>th</sup> Sept.	21 <sup>st</sup> Sept.
Mahanadi	Naraj	26.41	25.41	26.50	27.10	27.18	27.01
Devi	Alipingal	11.76	10.85	9.84	12.80	13.05	12.54
Kushabhadra	Nimapada	10.76	9.85	6.00	10.98	11.40	11.10
Brahmani	Jenapur	23.00	22.00	22.70	22.64	21.76	21.78
Baitarani	Anandapur	38.36	37.45	38.48	37.21	36.17	35.90
	Akhuapada	17.83	16.83	18.84	18.68	17.66	17.28
Burhabalanga	N.H-5 Govindpur)	8.13	7.21	7.46	7.06	6.34	5.46
Subarnarekha	Rajghat	10.36	9.45	9.51	9.52	9.12	8.53
	Jamsholaghat	49.15	48.10	47.44	47.24	46.74	46.40
Vamsadhara	Gunupur	84.00	83.00	84.05	82.68	82.29	82.67
	Kashinagar	54.60	53.60	56.55	54.80	54.20	54.53
Rushikulya	Purushottampur	16.83	15.83	16.80	16.10	15.35	15.10

### Reservoir Position

The tributaries of the river Mahanadi, Tel, Suktel, Hati, Udanti etc. were in spate causing devastation in Bolangir, Sonapur and Kalahandi districts. To make the situation worse, there was heavy rainfall in the upper catchments of Mahanadi river in the neighbouring Chhatisgarh State. The Hirakud reservoir started receiving more than eight lakh cusecs of water from Chhatisgarh State and the flood water had to be discharged into the Mahanadi river as the level approached the Full Reservoir Level (FRL) i.e. 630 feet.





The intensity of rainfall can be well imagined from the above-mentioned weighted average rainfall of upstream and downstream of Hirakud Dam. The tributaries of the Mahanadi in the downstream of Hirakud i.e Tel, Ong, Suktel and Jira experienced high floods. Heavy downpour led to flowing of these rivers over danger levels causing floods in western and coastal Districts. River Tel discharged a record peak of 11.92 lakh cusecs to the Mahanadi. With this discharge of water from the Tel and other tributaries, the mighty Mahanadi created floods in delta areas. The peak flood discharge at Mundali i.e delta head was 15.82 lakh cusecs on 20.09.2008. The contribution of Hirakud Dam to this peak flow at Mundali was 2.76 lakh cusecs. Also due to enormous inflow into the reservoir, the level of Dam was maintained nearing FRL at 630.00 ft for safety of the Dam. The water level of Hirakud reservoir was kept at 627.00 ft on 15.09.2008 within the rule curve limits. The inflow into the reservoir increased from 17<sup>th</sup> September from 54,000 cusecs to a peak of 7.51 lakh cusecs on 20.09.2008. On 18<sup>th</sup> September at 1300 hrs the reservoir level was 629.75 ft with an inflow of 3.41 lakh cusecs. The outflow from Hirakud reservoir was gradually increased matching to the inflow considering the safety of Dam and flood situation in delta area. Mundali has recorded a peak discharge of 15.81 lakh cusecs at 0100 hrs on 20<sup>th</sup> September 2008 in which the contribution of Hirakud Dam was 2.76 lakh cusecs i.e the discharge of Hirakud at 1300 hrs of 18.9.2008 as the travel time from Hirakud to Mundali is 36 hours. The peak inflow at Hirakud was recorded 7.91 lakh cusecs on 20.09.2008.

#### **Position of Hirakud Reservoir**

Date	Water level (in ft.)	Inflow (lakh cusecs)	Out flow (lakh cusecs)	No. of Gate opened
19.09.08	630.00	5.78	5.78	33
20.09.08	629.81	7.51	7.90	46
21.09.08	629.75	6.14	6.14	33
22.09.08	628.71	2.59	3.23	18



Downstream flood water of Hirakud reservoir coupled with huge inflow from the neighbouring State devastated Cuttack, Jagatsinghpur, Kendrapara, Jajpur, Puri and Khurda Districts in the Mahanadi basin. It is worth mentioning that the safe carrying capacity of Mahanadi river system is around 9 lakh cusecs at delta head (Naraj / Mundali) against which the peak discharge went upto 15.82 lakh cusecs approximately on 19<sup>th</sup> & 20<sup>th</sup> September 2008, which is at par with the severe floods that occurred in the year 1982.

### Discharge to Coastal Plain

The volume of water discharged at Mundali caused floods in Mahanadi delta areas. The water discharges at Khairmal, Barmul and Mundali in Mahanadi river system since 19.08.2008 are as follows.

Date	Discharge in lakh cusec		
	Khairmal	Barmul	Mundali
19.09.08	11.72	12.00	15.64
20.09.08	9.30	11.45	15.82
21.09.08	7.58	10.47	12.83
22.09.08	9.66	10.38	14.09

### Extent of Damages

#### September Floods, 2008

Sl	District	Blocks Affected	GPs Affected	Villages Affected	ULBs Affected	Population Affected	Human Casualty	House Damage
1	Cuttack	14	219	820	04	759328	20	31810
2	Kendrapara	09	137	591	02	672195	16	58429
3	Jagatsinghpur	08	61	188	0	147400	10	8072
4	Puri	10	140	871	01	772275	08	34437
5	Jajpur	10	118	552	02	622348	10	6760
6	Nayagarh	03	18	115	0	79610	0	1019
7	Bolangir	14	185	661	0	355524	03	6739
8	Boudh	03	30	120	01	81097	0	2341
9	Sonepur	06	48	344	03	56000	0	24415



10	Angul	08	87	273	03	24000	02	2525
11	Baragarh	12	245	1091	03	71867	0	16841
12	Sambalpur	03	64	183	0	52340	07	2881
13	Khurda	10	82	460	05	338462	02	1760
14	Kalahandi	13	240	781	03	20000	05	5981
15	Rayagada	11	141	411	01	183000	06	307
16	Gajapati	01	02	03	01	607	0	0
17	Nuapara	05	15	351	0	33646	0	5641
18	Bhadrak	04	47	209	0	252991	04	2518
19	Keonjhar	01	01	02	0	900	03	489
<b>Total</b>		<b>145</b>	<b>1880</b>	<b>8026</b>	<b>29</b>	<b>4523590</b>	<b>96</b>	<b>212965</b>

### June Floods, 2008

SI	District	Blocks Affected	GPs Affected	Villages Affected	ULBs Affected	Population Affected	Human Casualty	House Damage
1	Balasore	5	115	1114	4	942959	10	38077
2	Bhadrak	4	49	222	-	261569	1	1437
3	Jajpur	3	28	142	1	106902	-	231
4	Mayurbhanj	7	40	125	4	50000	2	5445
5	Keonjhar	3	12	72	-	46696	1	
6	Kendrapara	3	33	93	-	86620	-	
<b>Total</b>		<b>25</b>	<b>277</b>	<b>1768</b>	<b>9</b>	<b>1494746</b>	<b>14</b>	<b>45190</b>

### Human Casualty

110 persons lost lives due to wall collapse, drowning etc. in the flood-affected districts. Following table shows the District-wise details.

SI.	District	Human Casualty		
		September	June	Total
1.	Cuttack	20	0	20
2.	Kendrapara	16	0	16
3.	Jagatsinghpur	10	0	10
4.	Puri	08	0	08
5.	Jajpur	10	0	10
6.	Bolangir	03	0	03



7.	Angul	02	0	02
8.	Sambalpur	07	0	07
9.	Khurda	02	0	02
10.	Kalahandi	05	0	05
11.	Rayagada	06	0	06
12.	Bhadrak	04	01	05
13.	Keonjhar	03	01	04
14.	Balasore	0	10	10
15.	Mayurbhanj	0	02	02
<b>Total</b>		<b>96</b>	<b>14</b>	<b>110</b>

### Loss of Livestock

1375 milch animals, 302 draught animals and 50163 poultry birds lost lives due to floods.

Name of the District	No of Livestock / Birds lost				
	Milch Animal		Draught Animal		Poultry Birds
	Buffalo/ Cow	Sheep/ Goat	Camel/ Horse/ Bullock	Calf/ Donkey/ Pony	
Bargarh	1	8	18		9
Bolangir	2	36	-		
Boudh	16				
Cuttack	61	296	104		35500
Jagatsinghpur	9	8	12		11004
Jajpur	18	120	9	13	1500
Kalahandi	5	46	3	3	
Kendrapara	15	35	12		
Khurda	2				
Nayagarh	18	24	29		
Puri	26	61	24		
Nuapada	42	385	43	32	2150
Balasore	38	103			
<b>Total</b>	<b>253</b>	<b>1122</b>	<b>254</b>	<b>48</b>	<b>50163</b>



## House Damage

Sl.	District	Fully Damaged		Severely Damaged		Partially Damaged	Huts Damaged	Total
		Pucca	Kutcha	Pucca	Kutcha			
1	Angul	2	158		308	2057	0	2525
2	Balasore	64	2297	108	6527	24917	4164	38077
3	Bargarh		896		3040	12384	521	16841
4	Bhadrak	1	88		303	3563		3955
5	Bolangir		701		6038			6739
6	Boudh	1	224	26	779	1266	45	2341
7	Cuttack	68	2725	515	4567	19304	4631	31810
8	Jagatsinghpur	1	141	11	1797	5105	1017	8072
9	Jajpur		287		860	5267	577	6991
10	Kalahandi		326	5	864	4714	72	5981
11	Kendrapara	6	3596	127	12950	35644	6106	58429
12	Keonjhar		7		75	402	5	489
13	Khurda	9	57	9	205	1480		1760
14	Mayurbhanj		450		1790	2705	500	5445
15	Nayagarh		38		104	877		1019
16	Nuapada		875		1021	3745		5641
17	Puri	0	1785	121	6637	17644	8250	34437
18	Rayagada		28		138	141		307
19	Sambalpur	1	189		256	2435		2881
20	Subarnapur		1073	4	3586	19752		24415
Total		153	15941	926	51845	163402	25888	258155

## Crop Damage

About 382080.70 hectares of Kharif crop of small and marginal farmers sustained crop-loss of more than 50% due to floods.

Sl.	Districts	Crop Area Affected [in Hect.]	Total agricultural area where crop loss is > 50%
1	Cuttack	96573.68	92573.68
2	Kendrapara	64994.00	59994.00
3	Jagatsinghpur	15129.00	14829.00
4	Puri	72458.00	67458.00
5	Jajpur	29521.41	28521.41
6	Nayagarh	7913.00	4913.00



7	Bolangir	15381.00	11381.00
8	Boudh	12327.00	10327.00
9	Sonepur	7776.00	5776.00
10	Angul	7179.58	4179.58
11	Khurda	31168.00	26168.00
12	Kalahandi	17977.00	13977.00
13	Nuapara	3546.00	2546.00
14	Bhadrak	13020.00	10020.00
15	Balasore	49854.00	29245.00
16	Mayurbhanj	172.00	172.00
<b>Total</b>		<b>444989.7</b>	<b>382080.70</b>

### Sand Cast

Agricultural land of 14059.31 hectares was sand cast. The District-wise sand cast position is given below.

Sl.	District	Total Area under sandcast (in Hect.)
1	Cuttack	469
2	Kendrapara	626
3	Jagatsinghpur	100
4	Puri	350
5	Jajpur	20
6	Nayagarh	92
7	Bolangir	2401
8	Sonepur	3059
9	Angul	975.40
10	Baragarh	0.832
11	Sambalpur	0.465
12	Khurda	58.92
13	Nuapara	2546
14	Bhadrak	103.74
15	Balasore	102
16	Kalahandi	3154.95
<b>Total</b>		<b>14059.31</b>



### Livestock Affected

22.84 Lakh livestock were affected due to high floods in September. The District-wise affected livestock are given in the following table.

Sl.	District	Livestock Affected			Total
		Large	Small	Poultry	
1	Cuttack	267679	144301	105056	517036
2	Kendrapara	148227	68888	50755	267870
3	Jagatsinghpur	57016	30807	25378	113201
4	Puri	247833	79808	252975	580616
5	Jajpur	187327	71581	64695	323603
6	Nayagarh	17867	12409	8083	38359
7	Bolangir	13401	10267	--	23668
8	Boudh	10181	9485	--	19666
9	Sonepur	11985	6841	3920	22746
10	Angul	15000	7456	3250	25706
11	Baragarh	319	8	9	336
12	Sambalpur	8324	4334	2608	15266
13	Khurda	57070	15253	6200	78523
14	Kalahandi	38492	22754	19748	80994
15	Gajapati	5940	1377	--	7317
16	Nuapara	372	489	125	986
17	Bhadrak	100083	29405	37289	166777
18	Keonjhar	918	350	227	1495
Total		1184034	515813	580318	2284165



### Loss of livelihood

Due to floods, 2545 sericulture farmers were affected. The District-wise affected weavers and sericulture farmers are given in the following tables.

Sl.	Name of the District	No. of Farmers Affected
1	Cuttack	30
2	Kendrapara	130
3	Jagatsinghpur	157
4	Jajpur	44
5	Nayagarh	36
6	Angul	290
7	Mayurbhanj	680
8	Sambalpur	15
9	Dhenkanal	104
10	Kalahandi	52
11	Deogarh	11
12	Keonjhar	996
Total		2545

### Traditional Crafts

9350 Artisans belonging to 8 districts were affected due to floods. Similarly 4605 Artisans lost their raw materials. The district-wise detail is given below.

Sl.	Name of the District	No. of equipments fully damaged	No. of beneficiaries	Set of raw material fully damaged	No. of beneficiaries
1	Bhadrak	115	115	60	60
2	Kendrapara	2830	2830	1830	1830
3	Jagatsinghpur	1210	1210	293	293
4	Puri	183	183	183	183
5	Nayagarh	101	101	12	12
6	Khurda	159	159	159	159
7	Cuttack	4540	4540	1856	1856
8	Balasore	212	212	212	212
Total		9350	9350	4605	4605





### Handloom Weavers [Para-9(b) of CRF Norm]

2450 Loom equipment and accessories of 2450 beneficiaries were damaged. Yarn and other materials like dyes and chemicals of 2612 looms were washed away by the floods.

Sl.	Name of the District	No. of beneficiaries	No. of looms & accessories fully damaged	Set of raw material fully damaged
1	Angul	342	342	342
2	Jajpur	5	5	5
3	Subarnpur	283	283	322
4	Kendrapara	257	257	392
5	Bolangiri	253	253	253
6	Puri	82	82	82
7	Boudh	491	491	493
8	Khordha	3	3	3
9	Cuttack	454	454	497
10	Balasore	280	280	223
Total		2450	2450	2612

### Damage to Nets and Boats of Fishermen

1579 country boats and fishing nets were fully damaged. Similarly 4761 boats and nets were partially damaged due to floods. The district-wise position is given in the following table.

Sl. No	Name of the District	Boat & Net Units	
		No. of Units fully damaged	No. of Units partially damaged
1	Angul	4	16
2	Bhadrak	68	143
3	Boudh	85	173
4	Cuttack	222	319
5	Gajapati		32
6	Jagatsinghpur	19	1144
7	Jajpur	108	



8	Kalahandi	90	680
9	Kendrapara	285	155
10	Keonjhar	4	5
11	Khurda		120
12	Nayagarh	42	436
13	Puri	139	251
14	Sambalpur	15	8
15	Sonepur	474	1197
16	Balasore	24	82
	<b>Total</b>	<b>1579</b>	<b>4761</b>

## Damage to Public Infrastructure

### 1. Road Sector

#### (i) PWD Roads:-

209 breaches occurred in PWD roads. 3243.333 Km of PWD roads having 869 Culverts were damaged.

#### (ii) Rural Roads:-

1863 rural roads of length 5485.345 km were badly damaged due to floods. 56 culverts on rural roads were washed away and 1009 culverts were damaged extensively

#### (iii) Panchayat Roads:-

9007 Gram Panchayat and Panchayat Samiti roads having length of 17734.42 km were badly damaged due to floods. 7725 culverts on these damaged roads were badly affected.

#### (iv) Urban Roads:-

616.58km of urban roads and 131 culverts were damaged. Urban drains of length 130.45 km were also damaged.

#### (v) Embankment Roads:-

428.90 km of 255 roads in river and canal embankments were damaged due to floods



## **2. Drinking Water Supply Works**

### **Rural Water Supply**

266 Rural piped water supply systems and 26370 tube wells were damaged due to continuous inundation of flood water. 5576 platforms of tube wells were damaged.

## **3. Irrigation**

### **a) Minor Irrigation**

858 MI Projects were damaged due to floods in the State.

### **b) River and Canal Embankment**

Due to heavy floods in Mahanadi, Subarnarekha, Baitarani, Budhabalanga, Rushikulya, Badanadi, Vamsadhara, Hati and Jalaka, 651 breaches occurred in river and saline embankment. 1276 breaches in canal embankments occurred during floods.

Due to floods, heavy damages occurred to river and canal embankments, service roads on embankments, drainage channels, M.I. Projects, Lift Irrigation Points and field channels. All necessary preventive measures were taken at identified vulnerable points along river embankments prior to floods. Because of this, breaches were avoided in delta areas up to 14.00 lakh cusecs of flood water discharge. As the water discharge crossed 15.00 lakh cusecs, a large number of breaches occurred in embankments. Saline embankments were also damaged due to rough tidal action of Bay of Bengal. There were 511 breaches in river/saline embankments and 1391 breaches in canal embankments. About one third area of Mahanadi delta remained inundated for more than a fortnight. The breaches that occurred in river / canal embankments submerged human habitation and vast areas of the agricultural land.

### **c) Drainage System**

1332.52 km of drainage systems in different rivers were congested by debris and vegetative materials.



#### 4. School Buildings

2241 Primary School buildings were damaged due to floods.

#### 5. PHC / CHC

237 PHC / CHC buildings of following districts were damaged due to floods.

#### 6. Panchayat Ghars

659 Panchayat ghars/ community halls of different Gram Panchayats and Panchayats Samities were damaged due to floods.

### FLOOD MANAGEMENT

#### (a) Rescue and Evacuation

30856 people were evacuated to safer places and kept in temporary shelters during the floods.

All five units of ODRAF (Orissa Disaster Rapid Action Force) were deployed in Cuttack, Balasore, Bhadrak, Jajpur & Mayurbhanj districts for rescue and relief operation.

SI No.	District	People Evacuated
1	Cuttack	115299
2	Kendrapara	73202
3	Jagatsinghpur	38579
4	Puri	52357
5	Jajpur	5490
6	Nayagarh	22000
7	Bolangir	14523
8	Boudh	24104
9	Sonepur	22883
10	Angul	12952



11	Baragarh	3006
12	Sambalpur	1305
13	Khurda	4434
14	Kalahandi	1500
15	Rayagada	980
16	Keonjhar	900
17	Balasore	27310
18	Mayurbhanj	10032
<b>Total</b>		<b>430856</b>

(b) Free kitchen

Evacuated people were provided with adequate quantities of dry and cooked food through free kitchen centers. 1118 free kitchen centers were opened covering 430198 beneficiaries.

Sl.	District	Free kitchen centres opened	Duration of operation of relief camps (in days)	Beneficiaries covered
1	Cuttack	125	7	78861
2	Kendrapara	298	7	197806
3	Jagatsinghpur	58	7	32832
4	Puri	39	8	13725
5	Jajpur	62	4	9177
6	Nayagarh	14	2	11000
7	Bolangir	32	2	10753
8	Boudh	11	2	1967
9	Sonepur	34	3	12113
10	Angul	35	2	12952
11	Sambalpur	4	3	1821
12	Khurda	2	4	584
13	Kalahandi	11	3	1500
14	Rayagada	2	2	130
15	Gajapati	1	3	312
16	Nuapara	42	4	6423
17	Keonjhar	2	2	900
18	Balasore	325	4	27310
19	Mayurbhanj	21	2	10032
<b>Total</b>		<b>1118</b>		<b>430198</b>



**(c) Deployment of Boats**

For rescue and relief operation, 54 power boats with 162 crew of ODRAF / State Fire Service, 43 boats with 215 crew of NDRF, 25 Boats with 100 crew of BSF, 5 Boats with 50 Crew of Navy (INS Chilika) were pressed into action. In addition, 78 Boats with 140 crew of State Port Engineering Organization were deployed. Besides, 1810 boats owned by private individuals were utilized for rescue and relief operation.

**(d) Emergent Relief**

In view of the intensity of the high floods and devastation, emergent relief was sanctioned for a period of 15 days for the marooned people of the flood affected Districts. Emergent relief in shape of rice, chuda and guda was distributed in the flood affected villages. In addition to that dry food, candles, matchboxes, kerosene and other essential materials were distributed. The rate of emergent relief per beneficiary was within the rate prescribed in the CRF norms i.e Rs.20/- per adult per day and Rs.15/- per child per day.

**(e) Ready to eat for Affected Children**

Children and infants in the flood-affected areas were provided with nutritious baby food for a period of 15 days at a package worth of Rs225/- per child.

**(f) Air-dropping**

**September 2008**

The helicopters of Indian Air Force were requisitioned from the Ministry of Defence in order to facilitate the airdropping of food packets in the marooned areas for flood victims. 75,000 food packets were airdropped through IAF MI Helicopters in Kendrapara, Cuttack, Jagatsinghpur and Puri Districts.



## June 2008

The helicopters of Indian Air Force were requisitioned from Ministry of Defence in order to facilitate the air-dropping of food packets in the marooned areas for the flood victims. 50,000 food packets were air-dropped through IAF MI Helicopters in Balasore District.

### (g) Closure of Schools

Schools were suspended in the flood affected areas of Cuttack, Jagatsinghpur, Kendrapra, Jajpur, Puri, Khurda, Nayagarh, Sonapur, Boudh, Bolangir Districts. The schools in these areas were used as relief camps and free kitchen centers.

### (h) Temporary Shelter Materials

83242 families were provided with polythene sheets for temporary shelter since houses were damaged either fully or severely.

### (i) Health & Sanitation

In order to prevent outbreak of epidemics, 172 medical teams were deployed in the flood-affected Districts and 559 Medical Relief Centres were opened. 332121 ORS packets, 3629933 Halogen tablets were distributed.

SI	District	Medical Mobile Teams Deployed	Medical Centers opened.	ORS	Halogen Tablets
1.	Cuttack	20	94	13394	568206
2.	Kendrapara	04	117	76397	536900
3.	Jagatsinghpur	26	43	143703	910273
4.	Puri	13	89	9087	882360
5.	Jajpur	12	62	7316	109182
6.	Nayagarh	06	16	420	92400
7.	Bolangir	04	01	500	20782
8	Boudh	09	33	--	20000
9	Sonapur	09	09	12200	20800
10	Angul	03	07	124	4000
11	Sambalpur	--	--	--	18000
12	Khurda	26	20	3153	165670



13	Kalahandi	15	08	--	70000
14	Gajapati	01	06	25	2500
15	Bhadrak	04	07	3450	35300
16	Keonjhar	--	--	--	2000
17	Balasore	15	44	41352	148000
18	Mayurbhanj	5	3	21000	23560
<b>Total</b>		<b>172</b>	<b>559</b>	<b>332121</b>	<b>3629933</b>

**(j) Drinking Water**

Adequate arrangements were made for supply of safe drinking water in the flood-affected areas. 103 water tankers and 129 mobile vans were deployed. 4949700 water pouches were distributed.

SI	District	Tankers Deployed	Water Pouches Distributed	Mobile Vans Deployed
1	Cuttack	09	1334700	30
2	Kendrapara	11	1215000	13
3	Jagatsinghpur	10	492000	12
4	Puri	18	894900	10
5	Jajpur	03	239000	10
6	Nayagarh	01	162000	03
7	Bolangir		25000	17
8	Boudh		10000	02
9	Sonepur			03
10	Angul		2000	
11	Baragarh		400	04
12	Khurda	02	165000	06
13	Gajapati		5000	
14	Bhadrak		27700	02
15	Balasore	14	377000	10
16	Mayurbhanj	35	0	7
<b>Total</b>		<b>103</b>	<b>4949700</b>	<b>129</b>





### Disinfection of Drinking Water Sources

Sl	District	Wells Disinfected	Tube Wells Disinfected	PWS System Disinfected	Bleaching Powder Distributed (in Bags)
1	Cuttack	1207	6948	31	529
2	Kendrapara		2807	21	343
3	Jagatsinghpur	63	4910	11	533
4	Puri	138	1260	10	230
5	Jajpur		1351	09	77
6	Nayagarh	204	587	22	73
7	Bolangir		3364	18	122
8	Boudh	162	850		72
9	Sonepur	10	876	02	81
10	Angul		292	01	15
11	Baragarh		610		52
12	Sambalpur		12	10	
13	Khurda	365	772	08	180
14	Kalahandi		305	04	66
15	Rayagada				
16	Gajapati		200	01	50
17	Nuapara		89	12	125
18	Bhadrak		693		55
19	Keonjhar		50	02	175
20	Balasore	1250	1816		
<b>Total</b>		<b>2149</b>	<b>25976</b>	<b>162</b>	<b>2778</b>

#### (k) Animal Care

Affected animals were shifted to safer places. 272 veterinary teams were deployed in the flood affected areas. 4.31 lakh livestock were treated and vaccinated.

#### (l) Cattle Feed

District	Cattle feed Supplied & distributed (in MT)
Puri	758
Cuttack	1140



Kendrapada	1300
Jagatsinghpur	870
Khordha	180
Boudh	17
Nayagarh	100
Jajpur	410
Bolangir	25
Bhadrak	225
Anugul	50
Subarnapur	50
Kalahandi	40
Balasore	350
Mayurbhanj	25
<b>Total</b>	<b>5540</b>

### Highlights of Flood Management

The State Government had successfully managed the floods 2008. The highlights of flood management are mentioned below.

### Administrative Initiatives

- 1) All financial assistance out of CRF for pure relief i.e House Building Assistance, Ex- gratia Assistance, Agriculture Input Subsidy, Sand Cast Assistance etc. were provided to the flood victims through Account Payee Cheque to maintain transparency. The District Administration had opened a zero balance Bank Account in the name of the beneficiaries.
- 2) The rate of emergent relief per beneficiary is within the rate prescribed in the CRF norms i.e. Rs.20/- per adult per day and Rs.15/- per child per day.
- 3) Children and infants in the flood-affected areas were provided with nutritious baby food for a period of 15 days at a package worth of Rs.225/- per child.
- 4) Concentrated and good quality cattle feed had been provided to the affected cattle.



- 5) 15 days emergent relief were provided to the marooned / evacuated people besides the free kitchen provided to them.
- 6) Hire charges of the rates of the different boats used in flood relief/rescue purpose has been enhanced.
- 7) The damaged houses due to air- dropping of food packets have been considered as partially damaged houses and House Building Assistance has been provided as per the prescribed scale.
- 8) The helicopters of Indian Air Force had been requisitioned at State Headquarters immediately.
- 9) The District Administrations had been instructed to lift the sand deposit from the agriculture land under NREGS alongwith the provision of sand cast assistance out of CRF.
- 10) Immediate repair of damaged infrastructures were carried out within 45/60 days as per revised CRF Norms.
- 11) The networks of GP/PS roads damaged severely were restored. The restoration works had been verified and checked by technical squads.
- 12) All breaches on the roads /river & canal embankments had been closed immediately for relief line clearance.
- 13) All State Government offices remained open in Dussehra festival for flood management.

#### **Visit of Union Home Minister**

During peak floods in the Mahanadi river system on 23<sup>rd</sup> September 2008, Hon'ble Union Home Minister made an aerial survey of the flood affected areas accompanied, among others, by the Vice-chairman, National Disaster Management Authority (NDMA) and Secretary, Border Management, Government of India. A preliminary Memorandum was submitted to Hon'ble Minister indicating the approximate loss of Rs.2454.35 Crore with request to grant at least Rs.1500 crore to Orissa out of National Calamity Contingency Fund (NCCF) and sanction of 2 lakh IAY houses immediately.

Realizing the gravity and magnitude of the devastation, the Home Minister, Government of India announced financial assistance amounting to



Rs.500 crore to the State towards immediate relief and restoration. Subsequently, the Union Home Minister reiterated the Government of India's commitment for such assistance vide his letter No.V-23566/HMP/2008 dated 29<sup>th</sup> September 2008 addressed to Hon'ble Chief Minister, Orissa. But Govt. of India has released only Rs 98.87 crore out of NCCF.

### Visit of the Central Team

The Government of India had deputed an Inter-Ministerial Central Team led by Shri O. Ravi , Joint Secretary, Ministry of Home Affairs for an on the spot assessment of the damages from 06<sup>th</sup> to 09<sup>th</sup> January, 2008.

### Assistance sought from Govt. of India

Finally, as per the damage report received from Collectors and Departments, the total loss to various sectors came to Rs2687.43 crore. A **Memorandum** on this account was submitted to Government of India on 19.11.2008 requesting financial assistance of **Rs. 2687.43** crore out of NCCF for completion of the process of relief and restoration of the devastation caused due to floods 2008 and special allocation of **2 lakh IAY houses** for flood victims of BPL category whose houses had been damaged due to floods.

### Funds released by GOI

The Government of India had released Rs.300.00 crore for the above purpose as detailed below.

	<i>[Rs. in crore]</i>
2 <sup>nd</sup> Instalment of Centre's contribution to CRF 2008-09	Rs.123.36
Advance out of the Centre's Contribution from CRF 2009-10	Rs.77.77
Grant from NCCF	Rs.98.87
<b>TOTAL</b>	<b>Rs.300.00</b>



Later, the High Level Committee (HLC) of Government of India on 19.4.2009 approved the following financial assistance under different units in the wake of floods 2008 in Orissa.

- 1) Rs.389.29 crore for floods 2008 out of NCCF subject to adjustment of 75% balance available in the CRF account of State.
- 2) Rs.7.67 crore from Special Component of ARWSP.
- 3) Payment for air bills for airdropping of essential supplies, based on actuals.

Further, it was reported that the amount eligible for release from NCCF worked out to be "nil" for instant calamities.

\*\*\*

## CHAPTER - III

### Other Calamities

#### Fire Accidents

Most of the people of the state are socially and economically backward. They live in thatched houses which are prone to fire. Fire accidents generally occur during summer and it causes unpredictable loss to lives and properties.

District-wise loss to lives and properties due to fire accident during the period under report is given below.

#### Death due to Fire Accident 2008

Sl.	District	Name of the Deceased	Age	Village	Block /Tahasil / Police Station	Date of Death
1	2	3	4	5	6	7
1	Angul	Sunita Das D/o Sridhar	5	Ranibhuin	Kishorenagar	11.05.08
2	do	Pankaj Lochan Sahu S/o Arjun Sahu		Batisuan		30.05.08



1	Cuttack	Chandan Mallik S/o Badal	12	Kasati	Kendrapara	21.04.08
2	do	Badal Mallik S/o Gouranga	36	Kasati	Kendrapara	22.04.08
3	do	Surendra Mallik S/o Baja	30	Kasati	Kendrapara	24.04.08
4	do	Ajay Kumar Das S/o Bairagi	46	Kulesukarpada	Salipur	26.04.08
5	do	Bapi Mallik S/o Surendra	15	Kasati	Kendrapara	26.04.08
6	do	Niranjan Jena S/o Sura	45	Jaidaspur	Kendrapara	26.04.08
7	do	Nimai Charan Swain S/o Achutananda	37	Jhadeswarpur	Mahanga	30.04.08
8	do	Kartik Patra S/o Golakh Kusupur	42	Kusupur	Mahanga	30.04.08
9	do	Panchanan Mallik S/o Babaji	45	Ksati	Kendrapara	03.05.08
10	do	Kulamani Sahu S/o late Sindhu Patsura		Salipur		03.05.08
1	Dhenkanal	Sagar Mallik S/o late Samir	5	Kingol	Bhuban	04.01.08
2	do	Subha Mallik S/o Bill	4	Kingol	Bhuban	04.01.08
1	Ganjam	Tulasi Swain W/o Naru		Panikeswar	Buguda	15.03.08
2	do	Parvati Nanda W/o Gouri Shankar		Lokanathpur	Chatrapur	08.07.08
3	do	Manguli Maharana S/o Bhagirathi		Bhaliagochha	Sorada	29.05.08
4	do	Smt. Tulasi Barik W/o late Uchhab				18.01.08
1	Kendrapara	Pratima Nayak W/o Ajaya Kumar		Taras	Rajkanika	11.11.08
1	Mayurbhanj	Chanda Munda W/o Suren	75	Badmunda	Gourmabisani	18.01.08
2	do	Gayamani Pulhal W/o Susarsan		Patisaro	Badasahi	25.12.08
3	do	Bhagban Das		Rasgovindpur		04.01.08
1	Nayagarh	Jayashri Mohapatra D/o Hata	22	Kesharpur	Nayagarh	11.01.08
2	do	Rajani Pani W/o Benudhar		Golgala	Nayagarh	01.02.08
3	do	Swarna Prava Behera W/o Kalia	26	Badapandusar	Nayagarh	03.12.08
1	Sambalpur	Anu Oram D/o Late Oram		Rengali	Badapada	19.11.08

**Loss of Property due to Fire Accident and Account of Relief given during the year 2008-09**

[Rs. in lakh]

Sl. No.	Name of the District	No. of accident	No. of villages affected	No. of families affected	Approx. value of properties lost	No. of persons died	No. of cattle died	Relief provided	
								HBA & Others	Ex-gratia
1	2	3	4	5	6	7	8	9	10



1	Angul	212	206	476	91.45	3	5	19.26	1.00
2	Balasore	366	256	366	128.90			18.87	
3	Bargarh	44	44	44	3.54			0.54	
4	Bhadrak	466	264	498	208.34			18.06	
5	Bolangir	39	39	85	8.50	2		4.57	1.00
6	Boudh	124	124	526	80.99			11.93	
7	Cuttack	203	196	381	46.36			3.97	
8	Deogarh	28	19	28	2.96			0.24	
9	Dhenkanal	203	203	542	138.27	6		15.49	4.00
10	Gajapati	77	76	246	17.22			3.32	
11	Ganjam	608	701	1761	199.56	4		26.59	4.00
12	Jagatsinghpur	240	168	240	54.93		1	5.83	
13	Jajpur	390	336	449	74.29		2	7.02	
14	Jharsuguda	9	9	13	1.62			0.31	
15	Kalahandi	23	23	23	2.90			0.22	
16	Kandhamal	211	149	223	28.42	1		2.07	
17	Kendrapara	306	263	376	76.76			7.19	
18	Keonjhar	189	158	281	28.25			4.56	
19	Khordha	186	186	453	72.70			9.76	
20	Koraput	298	151	271	23.14			4.68	
21	Malkanagiri	81	69	81	9.86			3.49	
22	Mayurbhanj	392	268	392	236.85			6.68	
23	Nawarangpur	104	104	144	28.65			2.16	
24	Nayagarh	174	173	701	71.97	2	1	8.64	
25	Nuapara	19	19	19	4.00			0.02	
26	Puri	174	174	367	71.16		8	7.03	
27	Rayagada	45	45	173	29.87			10.69	
28	Sambalpur	36	34	115	34.35			0.03	
29	Subarnapur	104	104	338	63.74	3		20.45	3.00
30	Sundargarh	2	2	9	0.99			0.00	



Total	5353	4563	9621	1840.52	21	17	223.64	13.00
-------	------	------	------	---------	----	----	--------	-------

## Lightning

In comparison to other natural calamities, the number of death cases due to lightning is high in Orissa. It occurs throughout the year. 362 persons have lost their valuable lives during the year 2008. The detailed list of the victims died due to lightning is given below.

### Lightning Death 2008

Sl.	District	Name of the Deceased	Age	Village	Block /Tahasil / Police Station	Date of Death
1	2	3	4	5	6	7
1	Angul	Kiranbala Barik D/o Dhaiga	22		Bantala	30.03.08
2	Do	Binapani Pradhan D/o Ghanashyam		Dadhiabeda	Jarapada	08.05.08
3	Do	Dileswar Majhi S/o Bhaskar		Pipalbahal	Chhendpada	04.04.08
4	Do	Upendra Dehury S/o Pranabandhu	40	Durgapur	Jarpada	06.05.08
5	Do	Saitu Khan S/o Amiruddin		Bachhipur	Bhaganpur (WB)	05.06.08
6	Do	Jatrakar Behera S/o Palau	33	Rotila	Pallahara	05.06.08
7	Do	Mandalata Patra W/o Kunthu		Bandamala	Rengala	03.06.08
8	Do	Sanjay Garnaik S/o Govind Garnaik	22	Sasamara	Rengali	04.04.08
9	Do	Chaitanaya Behera S/o Mangala	48	Biru	Kanha	22.07.08
10	Do	Udayamani Samal, S/o Kathi		Dasanali	Kanha	21.08.08
11	Do	Sabhadua Majhi W/o Sarat		Kosala	Chhendipada	31.08.08
12	Do	Anirudha Sahu S/o Pabana	24	Para	Jarapada	10.09.08
13	Do	Sukani Sahu W/o Anirudha	20	Para	Jarapada	10.09.08
14	Do	Hirabati Pradhan D/o Naresh		Kankei	Jarapada	11.09.08
15	Do	Jirarani Pradhan W/o Navash		Kankrei	Jarapada	11.09.08
16	Do	Puspalata Sahu W/o Dhobei		Kankuei	Jarapada	11.09.08
17	Do	Khechada Naik S/o Sudam	48	Ballipatia	Chhendipada	06.10.08
18	Do	Dillip Kumar Sahu S/o Bhaskar	19	Korada	Jarapada	06.10.08
1	Balasore	Anil Khandei W/o Sundar		Nuasahi	Nilagiri	24.02.08
2	Do	Puspalata Jena Alias Behera		Ganeswar	Ghodapal	24.02.08
3	Do	Sashikanta Bhoi		Sarajha	Basta	15.05.08





4	Do	Susila Mallick		Nuagaon	Basta	15.05.08
5	Do	Susanta Behera		Balbudhi	Basta	15.05.08
6	Do	Badhi Hembram		Batagrm	Bhograi	14.06.08
7	Do	Amulya Das		Jaleswar	Khadiamajhisahi	22.05.08
8	Do	Prasanta Patra		Oupada	Patpur	14.06.08
9	Do	Laxmikanta Patra		Akandi	Bhograi	25.06.08
10	Do	Chatubhuja Jena		Raipur	Balipal	05.07.08
11	Do	Kata Majhi		Kharasahpur	Soro	05.06.08
12	Do	Bhagirathi Panda		Bishnupur	Soro	24.07.08
13	Do	Prafulla Dalei		Narayanpur	Baliapal	14.06.08
14	Do	Kartik Patra		Jayanagarpatna		11.07.08
15	Do	Ratnakar Sahoo		Karua		26.06.08
16	Do	Sumati Maiti		Budhiamai		11.07.08
17	Do	Nityananda Nayak		Kalanda		08.08.08
18	Do	Gayadhar Sethi		Baunsapal		13.08.08
19	Do	Chittaranjan Pal		Sanamaisadi		13.08.08
20	Do	Budhikesam Bandha		Sarokana		08.07.08
21	Do	Mahendra Malik		Bodei		11.09.09
22	Do	Benudhar Moharana		Chandrapada		03.06.08
23	Do	Malati Parida		Alasua		06.08.08
1	<b>Bargarh</b>	Kabilal Suna S/o Angad		Bajenmunda	Buden	02.06.08
2	Do	Lachhman Rana S/o Satyananda		Dhoral	Paikamal	08.06.08
3	Do	Trilochan Jani S/o Kurti Jani		Ichhapali	Padmapur	16.09.08
4	Do	Ajit Kumar Dash S/o Subash		Amblipali	Bhatli	07.09.08
5	Do	Surath Mallik S/o Markanda		Murumkel	Bhatli	29.07.08
6	Do	Sabal Nag S/o Dhaneswar		Ressam	Bheden	04.08.08
7	Do	Hirandei Rana D/o Jadu		Khaliapali	Atabira	28.07.08
8	Do	Smt. Laibana Bag w/o Dasarathi		Patrapali	Sohela	06.10.08
9	Do	Gobinda Mahamalik S/o Bahadur		Tinkani	Barpali	05.10.08
10	Do	Jana Majhi S/o Ani Ulba			Bargarh	27.12.08
1	<b>Bhadrak</b>	Hrushikesh Panda S/o Prahallad	60	Nandoor	Dhusuri	08.05.08
2	Do	SK. Jakir hussein S/o SK Ahadm Alli	26	Purna Prasad	Chandabali	28.03.08
3	Do	Bilasini Jena W/o Subash	46	Aradi	Chandbali	07.08.08
4	Do	Panchanan Behera S/o Dukhiram Behera	32	Belagadia	Tihidi	24.06.08



5	Do	Kalabati Jena W/o Surendra	35	Dakhinabad	Bhandaripokhari	09.08.08
6	Do	Jadunath Biswal S/o late Ganesha		Daisingh	Bhadrak	07.08.08
7	Do	Bhagabat Majhi S/o Babani		Pahadpur	Dhamnagar	17.05.08
8	Do	Rajan Mallik S/o Sanatan	27	Nuagaon	Basudevpur	08.09.09
9	Do	Ramesh Mahanta S/o Nidhi		Gadala	Naikanidhi	24.07.08
10	Do	Kamala Kant Das S/o Tauli		Khantakuada	Basudevpur	07.10.08
1	<b>Bolangir</b>	Sadananda Padhan S/o Nirmal		Solband	Patnagarh	04.04.08
2	Do	Santa Tandi W/o Suman		Debandhapada	Titilagarh	05.04.08
3	Do	Jagnya Padhi S/o Radheshyam		Bramhmpara	Bolangir	03.06.08
4	Do	Gulapi Barik W/o Rupali		Chhatapipal	Bolangir	13.08.08
5	Do	Hareram Bag S/o Makara		Radbahal	Belpada	28.07.08
6	Do	Duryadhan Naik S/o Subas		Khasbahal	Saintala	13.09.08
7	Do	Nakula Bhoi S/o late Chatubhuja Bhoi		Bhuliabandha	Belpara	30.06.08
1	<b>Boudh</b>	Santosh Rajhansa S/o Baidhara		Maheswarpinda	Manmuna	03.04.08
2	Do	Dibyajoti Barik S/o Shyamaghana		Ramgarh	Boudh	23.07.08
3	Do	Smt. Bhumisuta Kanhar W/o Purandar		Kelakata	Boudh	27.07.08
4	Do	Smt. Sugyani Pradhan W/o Ashok		Palaspat	Bausuni	27.07.08
5	Do	Sajit Pradhan S/o Charan		Tabada	Manmunda	03.09.08
1	<b>Cuttack</b>	Kabi Mohanty S/o Ananta Veda		Veda Ramachandrapur	Banki	04.04.08
2	Do	Puspalata Bhoi W/o Bhima		sidheswarpur	Sadar	07.08.08
3	Do	Sukanta Kumar Swain S/o late Baishnuba				07.08.08
4	Do	Subal Mantri S/o Aparti		Golkarnakhal	Tigiria	31.05.08
5	Do	Nityananda Sahoo, S/o Krashna Chandra		Manpur		31.05.08
6	Do	Sridhar Sahoo S/o Kartik		Benupara	Mahanga	19.08.08
7	Do	Kumar Behera S/o Nath	45	Ragadipatna	Banki	08.09.08
8	Do	Arakhita Behera S/o Bairagi		Pratapnagari	Sadar	04.06.08
9	Do	Diptimayee Senapati		Pratapnagari	Sadar	
10	Do	Manoranjan Pradhan		Pratapnagari	Sadar	
11	Do	Dhaneswar Pradhan S/o late Laxman		Bindhanima	Tigiria	06.09.08
12	Do	Sankarsan Behera S/o Sadam		Parsurampur	Athagarh	09.06.08
13	Do	Dhirendra Pradhan S/o Karuni		Sankarpur	Choudwar	08.06.08
14	Do	Ramesh Ch. Pradhan S/o		Bramhanbhuin	Kishorenagar	08.08.08



		late Kanduri				
15	Do	Kalandi Jena S/o late Adhikari Jena		Nishipur	Dampara	06.10.08
16	Do	Chhabindra Chhatoi s/o Dhoba		Ramchandrapur	Banki	20.09.08
17	Do	Bijay Kumar Gochhi S/o Bharat		Ramachandrapur	Banki	20.09.08
18	Do	Ratnakar Mallick S/o Ajati		Dampada		06.10.08
1	Deogarh	Purna Chandra Pola S/o Gaya		Bisibahali Posi	Barkota	08.07.08
2	Do	Amar Pradhan		Khajuridarha	Tileibani	08.09.08
1	Dhenkanal	Dillip Kumar Mahalik S/o Kalindi		Balipada	Kamakshyanagar	01.04.08
2	Do	Chaura Sahu W/o late Gandharba		Tarakabeda	Balami	14.05.08
3	Do	Sukanti Baliarsingh W/o Pandab	25	Kankapur	Brahmagiri	10.05.08
4	Do	Saraswati Sahu W/o Mitu	45	Anlabereni	Tamusingha	03.06.08
5	Do	Biswajit Khunita S/o Bibhuti	14	Balarampur	Sadar	10.06.08
6	Do	Santosh Kumar Lenka	30	Bada Gunjar	Bramhagiri	25.06.08
7	Do	Manju Padhan D/o Nath	20	Pangatira	Parjang	07.06.08
8	Do	Dasarathi Rout S/o Sanatan	23	Dhirapatna	Sadar	26.07.08
9	Do	Miti Naik W/o Gati Krushna	25	Ellejang	Gondia	26.07.08
10	Do	Khetrabasi Sahu S/o Nidhi	74	Sahughar patna	Bhuban	19.08.08
11	Do	Rama Chandra Dash S/o Khetra		Basulei	Parjang	02.09.08
12	Do	Rama Nayak S/o Kunja	60	Badasulia	Kamakshyanagar	30.08.08
13	Do	Bula Prusty S/o Ganga	41	Tangapada	Kamakshyanagar	30.08.08
14	Do	Kapila Sahoo S/o Budhimanta	45	Khatakhura	Kamakshyanagar	01.09.08
15	Do	Sanjaya Kumar Mohanty S/o Nrushingh	27	Arithukudakatani	Gondia	10.09.08
16	Do	Litua Malik D/o Kapila	17	Nityanandapur	Gondia	01.09.08
17	Do	Ichha Taisan D/o Bijaya	23	Kampulei	Kamakshyanagar	14.09.08
18	Do	Trinath Dehury S/o Bhajaman	53	Chadeiragarh	Kamakshyanagar	14.09.08
19	Do	Saranga Panjari Parida S/o Muralidhar		Rasasing	Sadar	15.09.08
20	Do	Basanta Naik S/o Angad	50	Gobindapur	Sadar	22.09.08
21	Do	Siba Naik S/o Mandar	35	Govindpur	Sadar	22.09.08
22	Do	Dileswar Sahoo S/o Ainthu	52	Kadarsingha	Parjang	05.10.08
23	Do	Balimahanta W/o Bhairab	50	Urbangi	Kamakshyanagar	09.10.08
24	Do	Saroj Biswal S/o Fathir	25	Kanpur	K. Nagar	13.10.08
1	Gajapati	Gouri Kumar Khadgoray S/o late Simanchal	30	Chitrakar street	Parlakhemundi	23.05.08



2	Do	Tungana Sabarju	25	Paralasaahi	Parlakhamundi	21.04.08
1	<b>Ganjam</b>	Dukha Gouda s/o Murali		Balipata	Bhanjanagar	19.03.08
2	Do	Smt. Dantia Pradhan W/o Trinath		Dwarabuguda	Kodala	28.03.08
3	Do	Narayan Sasmal S/o Bipra		Tillisinghi	Bhanjanagar	01.04.08
4	Do	Sahadev Gouda S/o Punia	55	SKSPur	Kholikote	01.04.08
5	Do	Smt. Sodora Gouda W/o Sahadev		SKSPur	Kholikote	01.04.08
6	Do	Smt. Kamini Gouda W/o Saura		SKSPur	Kholikote	01.04.08
7	Do	Kshetrabasi Patra S/o Narasingha	55	Agyanprasad	Buguda	03.04.08
8	Do	Manoj Kumar Gouda S/o Banchha		Sardhapur	Hinjilicut	04.04.08
9	Do	Simila Krushamurty S/o S. Ganapati	22	Kotlingi	Chikiti	15.05.08
10	Do	Hansa Pradhan S/o Khetra	46	Ramachandrapur	Digapahandi	10.05.08
11	Do	Uchhab Das S/o Nakula	56	Odanai	Khalikote	12.05.08
12	Do	Rajendra Maharana S/o Krushna	44	Ankushpur	Berhampur	21.05.08
13	Do	S. Mangama D/o S. Jagaya	20	Chikalakhandi	Chhatrapur	23.05.08
14	Do	A. Balaji Patra S/o A. Sakilli	36	Sahaspur	Digapahandi	23.05.08
15	Do	Sarat Behera S/o Gola	35	Deulapedi	Digapahandi	23.05.08
16	Do	Khetra Jani s/o Baikoli	50	Khasua	Khalikote	23.05.08
17	Do	Dhoba Jani S/o Satura	37	Khasua	Khalikote	23.05.08
18	Do	Kuntala Pradhan W/o Bhanu	70	Khatakala	Buguda	23.05.08
19	Do	Parbati Subudhi W/o Ramesh	36	Athagadapatna	Kodala	23.05.08
20	Do	Rajendra Jena S/o Gania	22	Palakata	Surada	25.06.08
21	Do	Nandi Gouda S/o late Baraja	55	Karsamani	Digapahandi	12.07.08
22	Do	Ch. Madha S/o Ch. Rangunath		Golanthara	Kanisi	14.07.08
23	Do	Sadi Ramudu Reddy S/o S. Chiney		Dura	Berhampur	14.07.08
24	Do	S. Lachhu Patra S/o late Arakhita	18	Jagadalpur	Berhampur	13.07.08
25	Do	Pramila Gouda D/o Duba	18	Nimigaon	Hinjilicut	14.07.08
26	Do	Smt. Bishnu Gouda, W/o Lingaraj	40	Lingaraj	Hinjilicut	14.07.08
27	Do	B. Durjya Patra S/o B. Nitei	20	Adhei Baragam	Purusottampur	23.07.08
28	Do	Balaram Gouda S/o Kashinath	38	Gereda	Bhanjanagar	03.08.08
29	Do	Simachal Sahu S/o Mina	39	Boroda	Chhatrapur	23.08.08
30	Do	Jhadia Naik S/o Sukuta Naik		Balighai	Digapahandi	23.08.08



31	Do	Govinda Naik S/o late Narasinga		Sebak Tikarpada	Digapahandi	23.08.08
32	Do	Nira Gouda S/o Arjuna	45	Golapada	Bhanjanagar	23.08.08
33	Do	Kirtan Naik S/o late Sukuru		Binjhagiri	Bhanjanagar	04.09.08
34	Do	Sania Dalai (Sanibas Dalai) S/o Dandapani		Lenkakhali	Digapahandi	10.09.08
35	Do	Bilasi Naik W/o Sudarsan	40	Ataraipalli	Bhanjanagar	06.10.08
36	Do	Tita Swain S/o Khadal	21	Katakala	Buguda	06.10.08
37	Do	Maharagi Das S/o late Pradhan Das	53	Saradhapur	Khallikote	06.10.08
38	Do	Bhramar Pahan S/o Bhagat	25	Pallugada	Rambha	24.10.08
1	Jagatsinghpur	Lopamudra Dwibedi D/o Sashikant Dwibedi		Gomahokpur	Raghunathpur	01.04.08
2	Do	Karunakar Behera S/o Kalindi		Tihada	Jagatsinghpur	04.04.08
3	Do	Kulamani Pradhan S/o late Daitary				31.05.08
4	Do	Bijay Kumar Parida S/o late Narayan	53	Barabatia	Erasama	27.06.08
5	Do	Subash Maiti S/o Arabinda	33	Harishpur Goda	Jagatsinghpur	23.07.08
6	Do	Satyabhama Pradhan W/o Bharat	55	Fatepur	Jagatsinghpur	12.07.08
7	Do	Sarat Chandra Das S/o Naba	54	Olagada	Tirtol	22.07.08
8	Do	Rabindra Nayak S/o Musei	45	Otala	Tirtol	14.08.08
9	Do	Banamali Rout S/o Dhuna		Purunabasanta	Jagatsinghpur	06.09.08
10	Do	Niamin Samal S/o Bata Krushna		Chandol		22.07.08
11	Do	Nari Behera S/o Badhi		PasobanTapur		07.07.08
12	Do	Sidheswar Mallik S/o late Pari		Kundeswar		07.08.08
13	Do	Alekh Ch. Mohanty S/o Jaladhar		Behedpur		07.08.08
1	Jajpur	Hemalata Jena W/o late Nanda Kishore		Barabatia	Jajpur	15.05.08
2	Do	Radhakant Mishra		Bindhana		07.06.08
3	Do	Sanjay Mallik		Naupal	Dharmasala	29.08.08
4	Do	Bhghabat Dehuri		Tarapur	Dharmasala	29.08.08
5	Do	Basanta Kumar Roul S/o Nityanda		Khandara	Jajpur	30.06.08
6	Do	Dhanurjaya Mohant		Bandhagaon	Sukinda	08.08.08
7	Do	Geeta Mahanta		Pimpudia	Sukinda	09.08.08
8	Do	Jayaram & Jayanta Mallick		Olasa	Korei	27.06.08
9	Do	Padmanav Behera		Balikuda	Jajpur	26.06.08
1	Jharsuguda	Sabita Mohapatra D/o Ananda	30	Sahasbaga	Rehgali	03.06.08
2	Do	Rabindra Sandha S/o	35	Handasar	Banharpali	24.06.08



		Ananda				
3	Do	Sabitri Pujhari	45	Badimal	Banharpali	24.06.08
4	Do	Bhumisuta Bag W/o Purusottam	35	Bhatalaida	Laikera	15.07.08
5	Do	Dasami Pradhan D/o Dillip	15	Sripura	Badmal	06.10.08
6	Do	Jaya Kuamri Sagar S/o Prasamma Sagar	48	Goudmal	Brajarajnagar	05.10.08
1	<b>Kalahandi</b>	Basanta Majhi S/o Baleswar		Dhansuli	Jaipatna	08.06.08
2	Do	Sobha Majhi D/o Baleswar		Dhansuli	Jaipatna	08.06.08
3	Do	Jamuna Naik W/o Sweta Kuma		Ladugaon	Koksora	08.09.08
4	Do	Rohin Majhi S/o Sessa Makhapahal				09.08.08
5	Do	Debaki Majhi W/o Tanu Makhapala				09.08.08
6	Do	Tantripal Sahu S/o Dhanmat		Dukermal	M. Rampur	05.10.08
1	<b>Kendrapara</b>	Pabani Mallik S/o Bira	24	Singharpur	Patkura	04.04.08
2	Do	Govinda Behera S/o Brahmananda	55	Nuagaon	Patkura	21.05.08
3	Do	Chittaranjan Das S/o late Dhadi		Kuyanapal	Patkura	09.06.08
4	Do	Saraswati Ojha W/o Fukuna	44	Dalei Sahi	Rajnagar	13.06.08
5	Do	Gobardhan Nayak S/o late Gajendra	44	Baulang	Patkura	27.06.08
6	Do	Niranjan Sethi S/o Basudev	35	Poili	Kendrapara	10.07.08
7	Do	Ramesh Ch. Mallik S/o late Krushna Ch		Tivinia	Kendrapara	24.07.08
8	Do	Ganapati Rout S/o Bhagirathi	46	Anantapur	Kanika	23.07.08
9	Do	Chandan Mandal S/o Kartik	23	Khasmunda	Rajnagar	08.08.08
10	Do	Shibani Mandal W/o Chanda	34	Radhamalipur	Rajnagar	08.08.08
11	Do	Ramesh Ch. Behera S/o late Babaji	50	Giranga	Marshaghai	09.08.08
12	Do	Susil Kumar Malik S/o Golekha	24	Purunagopinathpur	Patkura	14.08.08
13	Do	Rajkishore Samal S/o Gopal	50	Saraswatipur	Patkhura	18.08.08
14	Do	Golekha Pradhan S/o Narayan	29	Nilikana	Kendrapara	08.09.08
15	Do	Trilochan Barik S/o Rajani		Srichandanpur		03.07.08
16	Do	Rajkishore Bal S/o Ananda		Bhangan	Kendrapara	14.08.08
1	<b>Keonjhar</b>	Prakash Chandra Sahoo S/o Keshab		Mergimunda	Ghasipur	25.05.08
2	Do	Surendra Naik S/o Gouranga		Cikhunda	Baria	14.07.08
3	Do	Madan Mohan Patra S/o Babaji		Kansa	Ghasipur	24.06.08
4	Do	Kamala Mohant W/o Purandar				29.03.08



5	Do	Babita Juang D/o Janguru				14.09.08
6	Do	Antaryami Mallik S/o Sarat		Dantia	Ramachandrapur	24.08.08
7	Do	Ashok Kumar Lenka S/o Kurshna Ch. Lenka		Ratakana	Nandipada	23.07.08
8	Do	Dhaneswar Mohanta S/o Raju		Gopalpur	Sadar	03.06.08
9	Do	Kamala Karji W/o Iswar		Jatna	Nayakote	29.03.08
10	Do	Lalmohan Munda S/o Kailash Munda		Bebartaposi	Sadar	21.11.08
11	Do	Umakanta Munda S/o Pancharatna		Bebartaposi	Sadar	21.11.08
12	Do	Banshidhar Sahoo S/o Bikala		Sarei	Ghasipura	24.08.08
1	<b>Khurda</b>	Jogi Behera S/o Narasingha	40	Bhsandpur	Tangi	05.06.08
2	Do	Ranu Swain S/o Brundaban		Godijhar Samili	Banpur	05.04.08
3	Do	Chhabi Jena W/o late Bhagaban		Galus Samili	Banpur	19.02.08
4	Do	Madhusudan Bhola, Banhanidhi	47			10.09.08
5	Do	Dikei Bhoi W/o Kanga	37	Bada Bhoi Sahi	Balipatna	24.09.08
6	Do	Ranjan Bhoi S/o Kalia		Samserpur	Satyabadi	14.09.08
7	Do	Abhimanyu Behera S/o Abakash		Patabandha	Bolagarh	23.07.08
8	Do	Kailash Sahoo S/o Satrugana		Bhatpada	Begunia	24.09.08
9	Do	Malika Bewa W/o Budhi	64	Pubusahi	Khurda	25.03.08
1	<b>Koraput</b>	Marta Harijan W/o Dhanapati		Kotta	Jeypore	29.05.08
2	Do	Suryamani Bhatra W/o Udhaba		Guniaguda	Kotapad	30.05.08
3	Do	Prafula Jani S/o Sahadev	12	Ambaguda	Dasamantpur	05.06.08
4	Do	Bendri Paraja W/o Ramachandra	44	Kusumguda	Jeypore	07.06.08
5	Do	Bati Paraja W/o Kama	35	Kusumguda	Jeypore	07.06.08
6	Do	Alla Harijan S/o Dharmadan		Chiliguda	Jeypore	07.06.08
7	Do	Meleka Penta S/o Meleka Birana		Chintaguda	Narayanpatna	21.07.08
8	Do	Luka Khara S/o Jaya		Gadikhamara	Pattangi	31.08.08
9	Do	sabita Pandia W/o Raghuram		Ambapada	Nandapur	07.09.08
10	Do	Raghunath Gouda S/o Khagapati		Sandhimunda	Bariguma	06.10.08
1	<b>Malkangiri</b>	Smt. Ara Madi W/o Deba	30	Boilapari	Malkangiri	05.06.08
1	<b>Mayurbhanj</b>	Baya Hansdah S/o Landar	16	Saragchhida	Chandua	04.04.08
2	Do	Sarojini Singh D/o Majhila	10	Laxmiposi	Baripada	14.04.08
3	Do	Kanda Hansdah D/o Late Bhugulu		Radhikasole	Baripada	19.03.08



4	Do	Sanjay Mohanty S/o Basudev		Bholagodia	Khunta	15.05.08
5	Do	Kshtish Ch Mahant S/o Ramanath	38	Beguniadiha	Suliapada	15.05.08
6	Do	Sephali Sethi W/o Bhaskar		Jiani	Kuliana	24.05.08
7	Do	Sini Ho W/o Sania		Bagadafa	Mahuldiha	11.05.08
8	Do	Pratap Singh Kalundia S/o Laxminarayan	40	Rambada	Tiring	05.06.08
9	Do	Sanu Singh S/o Baya	52	Pandra	Jharpokhaira	05.06.08
10	Do	Ajit Kumar Patra S/o Pradeep		Tillow	Jharpokhaira	14.04.08
11	Do	Chankidi Behera W/o Barda		Bhanra	Karanjia	20.05.08
12	Do	Fagu Majhi @ Marndi S/o Saira		Routrapur	Baisingha	06.06.08
13	Do	Sudhakara Naik S/o Parameswar		Barasahi	Barasahi	16.06.08
14	Do	Rabindranath Behera S/o Gadadhar	40	Bairatpur	Udala	26.06.08
15	Do	Laxman Marandi S/o Lasa		Sansaraposi	Chandka	01.07.08
16	Do	Sanket Patra S/o Sujit		Bhurungasole	Chandua	01.07.08
17	Do	Ratan Singh S/o late Pakul Jagannath		Khunta	Bangiriposi	01.07.08
18	Do	Jaladhar Singh S/o Madan Singh	48	Dolisul	Mayurbhanj	11.07.08
19	Do	Dinabandhu Soren S/o Barial	24	Hesalpata	Bahalda	30.07.08
20	Do	Kalpalata Mahanta D/o Ganeswar	35	Sankula	Badasahi	02.08.08
21	Do	Nagen Murmu S/o Shyam Sundar	30	Baghamara	Badasahi	22.07.08
22	Do	Dusasan Naik S/o Anukul		Nuabada	Sukruli	22.07.08
23	Do	Sadam Majhi S/o Rama Majhi		Badamanda	Bisoi	01.08.08
24	Do	Jayanti Mohant S/o late Barju		Dhanpur	Betnoti	23.07.08
25	Do	Sumati Kuanar		Goudruma	Baripada	26.07.08
26	Do	Sarojini Singh W/o Gouranga		Kuldihi	Suliapada	09.08.08
27	Do	Paresh Nayak S/o Keshar		Paikasahi	Rasagovindpur	13.08.08
28	Do	Nadei Hembram W/o Rathi		Chauliaposi	Udala	22.08.08
29	Do	Sanatan Ram S/o Sanyasi		Maimadiha	Rasagovindpur	13.08.08
30	Do	Budhi Singh D/o Kanya	11	Sanpokhari	Khunta	03.09.08
31	Do	Kalicharan Soren S/o Kayan		Tungasole	Badasahi	28.08.08
32	Do	Daktar Singh S/o Juja		Marigaon	Udala	31.08.08
33	Do	Birsingh Hembram S/o Kanda		Totapada	Rasagovindpur	08.09.08
34	Do	Tapu Singh S/o late Laga		Jampada	Kuliana	14.09.08





35	Do	Krishna Parida S/o Makura		Basantapur	Bangiriposhi	14.09.08
36	Do	Sanatan Singh S/o late Dash		Sananuagaon	Chandua	14.09.08
37	Do	Sipra Mohanda S/o Gamesh		Sinakali	Raruan	05.10.08
38	Do	Gurubani Singh W/o Raidas		Tumuda	Kuliana	03.08.08
39	Do	Dulla Singh	40			03.07.08
40	Do	Phatu Soren				03.09.08
41	Do	Gora Behera			Karanjia	03.09.08
1	<b>Nawarangpur</b>	Thakur Gouda S/o late Dinabandhu	23	Baharkanary	Jharigam	15.04.08
2	Do	Bishan Majhi S/o Giha	27	Nayakguda	Umerkote	14.04.08
3	Do	Sanabani Muria D/o Dhansai	11	Bansuli	Koding	30.04.08
4	Do	Dhoba Jani D/o Rabunu	20	Barkibhatta (Kangra)	Jharigaon	31.05.08
5	Do	Gopi gouda S/o Sukharam	40	Citabeda	Jharigam	09.06.08
6	Do	Debaki Harijan D/o Maniram	20	Dumardihi	Raighar	07.06.08
7	Do	Bhagatram Pujari S/o Jugadhar	25	Kusumpali	Kodinga	11.07.08
8	Do	Subhadra Chauhan D/o Sibaram		Chandhandi	Umerkote	07.10.08
9	Do	Sanbani Muria D/o Dhansai	11	Bansuli	Kodinga	30.04.08
10	Do	Moti Jani W/o late Hari	55	Kusumi	Nabarangpur	06.06.08
1	<b>Nayagarh</b>	Kabir Pradhan S/o Narabar	23	Gochha	Sarankul	04.04.08
2	Do	Dukhishyam Jena S/o Kela	65	Hariharpur	Sarankul	15.05.08
3	Do	Bibhuti Bhusa Satapathy S/o Kishore Ch.		Khangugaon	Nuagaon	23.05.08
4	Do	Manu @ Manoranjan Behera S/o Trilochan	25	Kunjabangarh	Dasapalla	24.05.08
5	Do	Dipu Mallik S/o Bharat	12	Jajangisahi	Nayagarh	01.06.08
1	<b>Nuapada</b>	Sahadar Ali S/o Fajar	38	Kumutimunda	Komna	20.03.08
2	Do	Nanga Majhi S/o Man Singh Majhi		Jamudahara	Nuapada	05.04.08
3	Do	Baliram Dharua S/o Sukuram		Pandra Pathar	Komna	02.06.08
4	Do	Hira Majhi		Bhela	Kamna	31.08.08
5	Do	Sayad Mustak Ali		Parkod	Jonk	04.04.08
6	Do	Nirsas alias Sana Majhi		Chindpani	Nuapada	31.05.08
1	<b>Puri</b>	Sunami Rout W/o Nata	65	Amuri	Purisadar	06.05.08
2	Do	Susant Kumar Parida S/o Sahadeb	26	Gadasanaput	Kanas	31.05.08
3	Do	Bidyadhar Baral S/o Sridhar	40	Uttarbad	Delanga	
4	Do	Santoshi Kumar Lenka S/o Sankar Lenka	30			
1	<b>Rayagada</b>	Rabindra Gouda, S/o	18	Borisiripur	Rayagada	15.07.08



		Subash				
2	Do	Praska Lacha S/o late Paska Sukura	38	Kartikaguda	Therabali	06.10.08
3	Do	Rurdra Naik S/o Hari	45	Ramgiri	Kasipur	10.10.08
4	Do	Jama Majhi S/o Chakra	48	Ramgiri	Kasipur	10.10.08
5	Do	Dengana Gagarvenga S/o Duringa	45	Chandrapuo	Gunupur	10.10.08
1	<b>Sambalpur</b>	Jayakrushna Kharsel S/o Gobardhan	45	Khanttamal	Katarobaga	05.06.08
2	Do	Prahalad Bhoi S/o Bhubaneswar	40	Khuntalamal		05.06.08
3	Do	Sudhansu Behera	42	Dumerpali	Sasan	05.06.08
4	Do	Pramod Kumar Saha S/o Agadhu		Khadapangada	Nayagarh	09.06.08
5	Do	Dusmanta Patel S/o Judhisthir		Barkukhnti	Nuapara	09.06.08
6	Do	Shiba Prasad Behera S/o Ramachandra		Kaisandhapur	Ganjam	09.06.08
7	Do	Jagatram Kisan S/o Banamali		Kanibandhali		07.06.08
8	Do	Malik Kaudi S/o Chamara		Badtitheipali	Sasan	07.06.08
9	Do	Prasanna Kumar Dehury S/o late Hara	47	Jagannathprasad	Naktideul	09.08.08
10	Do	Kirtan Majhi S/o Ramachandra Majhi	11	Gurla	Govindpur	12.05.08
11	Do	Dukhi Behera W/o Sri Kara	50	Keutibahal	Charmal	22.09.08
12	Do	Lambodar Pradhan S/o Nabaghana		Guljighara	Charmal	10.10.08
13	Do	Premsila Bade D/o Ganjam		Khandual	Dhanupali	03.09.08
14	Do	Rushi Majhi S/o Chumkaka		Rajababa	Govindpur	03.10.08
1	<b>Subarnapur</b>	Satya Sandha		Sankara	Binka	03.06.08
2	Do	Phula Martho W/o Chakna	20	Patikarpada	Binka	27.06.08
3	Do	Manjula Rana W/o Parameswar	40	Hingma	Biramaharajpur	14.07.08
4	Do	Dillip Baghi S/o Agasti	19	Thakapali	Tarbha	08.08.08
5	Do	Bhaskar Sethi S/o Koili		Siali	Binka	09.09.08
6	Do	Pustam Behera S/o Dolamani				16.09.08
7	Do	Kalash Naik S/o Bisikeshan	12	Pandakital	Sonepur	06.10.08
1	<b>Sundergarh</b>	Saga Mahanta W/o Rabi	40	Gopna	Balang	04.04.08
2	Do	Umesh Kinjiria S/o Khaira	13	Kapatikra	Lephripara	12.05.08
3	Do	Himadri Kisan S/o Laxman	13	Kaputikra	Lephripara	12.05.08
4	Do	Iswar Kisan S/o Masturam	11	Kaputikra	Lephripara	12.05.08
5	Do	Rajesh Majhi S/o Dubhaj	10	Kulsira	Hemgiri	12.05.08
6	Do	Kirtan Majhi S/o Ramachandra	11	Gurla	Gobindapur	12.05.08



7	Do	Binita Mundary D/o Mangal	11	Jamudihi	Korira	08.05.08
8	Do	Gouchand Bhoi S/o Kumar	48	Alanda	Rajgangapur	22.05.08
9	Do	Prafulla Ku. Sahu S/o Rahinda	65	Jaraikela	Bisra	22.05.08
10	Do	Birkan Kandulna S/o Bhakta	20	Chuabahal	Birmitrapur	22.05.08
11	Do	Sulsi Guri S/o Krupadas	40	Chiroberna	Rajgangpur	22.05.08
12	Do	Serephina Bag D/o Karlus	19	Chiroberna	Rajgangpur	22.05.08
13	Do	Albinush Toppo S/o Harush	40	Damos		22.05.08
14	Do	Balmukund Lakra S/o Junbua	70		Laxmipos	22.05.08
15	Do	Pitrush Lakra S/o Joa Kim	55	Ralunga	Rajgangpur	22.05.08
16	Do	Sania Kerketa S/o Mangra	20	Kurimati		25.05.08
17	Do	Dutia Pradhan S/o Munsu	55	Hamirpur	Sadar	03.06.08
18	Do	Luis Majhi S/o late Bhadra	45	Majhapara	Rajgangpur	27.06.08
19	Do	Bipin Bilung S/o Isu	36	Magarkunda	Kinjirkela	05.06.08
20	Do	Balaram Neti S/o late Kulamani		Kundra	Hemgiri	25.06.08
21	Do	Mohan Oram S/o Charua	14	Sunajore	Sadar	03.06.08
22	Do	Khireswari Biswal W/o Khageswar	50	Jangal	Lahuripara	08.07.08
23	Do	Bahadu Xaxa S/o Telenga	15	Tangarani	Birmitrapur	16.07.08
24	Do	Lily Suren D/o Gabriel	19	Anthuguda	Hatibari	14.07.08
25	Do	Rukmini Kallo, W/o Tirtharaj	45	Kantasar	Bonas	13.07.08
26	Do	Kunduli Oram W/o late Chamuru Oram	55	Nugaoan	Rajgangpur	09.08.08
27	Do	Dayasagar Seth S/o Gouri Shankar	42	Balbaspur	Hemgiri	03.09.08
28	Do	Andhrias Ker Keta S/o Tinga	55	Ghantchhapal	Kutra	11.08.08
29	Do	Chari Kindo S/o Chamru	85	Lanjiberna	Kutna	08.08.08
30	Do	Chita Lakra W/o Indu	60	Sagabeda	Birmitrapur	
31	Do	Kamal Sahu S/o Bigulu	40	Jakeikela	Bonai	09.08.08

## Landslide

Landslide is also a problem in Orissa. It often occurs due to heavy rain, flood and diversion of rivers. A major landslide occurred in Puruna Balasore of Balasore district on 21.08.2008. It damaged one two storied building. The Geological Survey of India has proposed to take up the detailed investigation to arrive at a final conclusion on the matter.



## **Kendrapara Tornado**

On 31st March 2009 at 2.47 pm, a message was received from India Meteorological Department, Meteorological Center, Bhubaneswar which is as follows. *"Latest radar observation indicates that thunder squall accompanied with hail with gusty surface wind speed reaching up to 60 km/ph likely to affect some parts of the Districts of Kandhmal, Gajapati, Ganjam, Khurda, Balasore, Bhadrak, Dhenkanal, Jajpur, Kendrapara and Cuttack between 1430 to 2030 hours of dated 31.3.2009".*

On 31st March 2009 at 1640 hours, the Tornado hit Rajkanika. The origin of Tornado was Ostia village of Rajkanika Panchayat of Rajakanika Block and it touched down the village according to eyewitness at 1640 hours of 31st March 2009. It then passed over Barada, Badatala, Asasa, Baghabuda, Govindpur, Kantapada (Rajkanika Block Headquarters), Ganja, Achutapur, Mukundpur, Manaidiha, Dasabhgaria, Mangalpur and Dalikainda village. The most affected area is of 0.6 km width and 6 km length covering the above villages and Baghabuda village was the most severely affected one.

The devastating Tornado accompanied with thunderstorm, rainfall and hailstorm hit ten villages of Rajkanika Block of Kendrapara District, killing 16 persons and injuring hundreds. Wind speed of more than 250 km/hr, the killer twister uprooted thousands of pucca and kutcha houses. The approach roads were blocked with massive uprooted trees. According to the eyewitnesses, the Tornado survived for about 10 minutes.

The Tornado broke loaded tractors into pieces and flown up to 50 feet and bustled with a big tree. Some roofs of non-structural concrete buildings were flown away and fell at a distance of 30-40 feet. Fishes weighing 1-2 kg were scattered here and there in the villages, which were thrown away by it. The fury of Tornado can be well imagined from the above.

An amount of Rs.2,08,24,348/- out of CRF was released in favour of Collector Kendrapara and Energy Department for disbursement of Ex-gratia, House Building Assistance, Clothing and Utensils, Assistance of grievous injury, emergent relief, Transportation charges, Contingency and Assistance to the persons for replacement of drought / milch animals and repair /



restoration of power supply to the affected villages.

The detailed damages are mentioned below.

1.	Date of Occurrence	-	31.03.2009
2.	No. of villages affected	-	12
3.	Population affected	-	10,000
4.	Cropped area affected	-	134.66 Hect.
5.	House damaged	-	1425
	i.	Fully damaged Pucca houses	- 1
		Fully damaged Kutcha houses	- 403
	ii.	Severely damaged Pucca houses	- 118
		Severely damaged Kutcha houses	- 506
	iii.	Partly damaged Pucca houses	- 251
6.	Human lives lost	-	16
7.	No. of persons with grievous injuries	-	143

### Hailstorm

18 villages of 3 districts were affected due to hailstorms during the year 2008-09. Rs.224.70 lakh has been provided to Collectors of Balasore, Kalahandi and Kendrapara districts out of CRF for disbursement of House Building Assistance, Ex-gratia assistance etc.

The district-wise details are given in the table below

#### Hail Storm (2008-09)

Sl. No.	Districts	Date of Occurrence		No. of Blocks affected	No. of GPs affected	No. of villages affected	Population affected	Casualty	
								Human	Cattle
1	2	3		5	6	7	8	9	10
1	Balasore	17.05.08		1	1	1		4	
2	Kalahandi	05.04.08		1	3	5			
3	Kendrapara	31.03.09		1	1	12	10,000	16	512
	Total			3	5	18	10,000	20	512



Sl. No.	Districts	No. of House damaged				Crop damage more than 50% (in hect.)	Relief Assistance Provided			
		Fully	Severely	Margi-nally	Total		House Building Assistance	For repair / restor-ation of public utilities	For input subsidy on crop loss	Total amount released
1	2	11	12	13	14	15	16	17	18	19
1	Balasore									4.00 lakh
2	Kalahandi			833	833	3559.56	12,45,500			12,45,000
3	Kendrapara	404	624	397	1425	134.66	65,79,000	73,63,000		1,34,61,348
	Total	404	624	1230	2258	3694.22	78,24,500	73,63,000		2,24,69,848

### Heat-Wave / Drinking Water Problem

Death due to heat-wave or Sunstroke is a disaster caused by one's exposure to environmental heat and humidity. During the year 2008-09, heat-wave conditions prevailed in almost all districts of the State. The State Government has repeatedly raised the issue for inclusion of heat-wave in the list of Natural Calamities before the Government of India and Finance Commission. So the ex-gratia amount @ of Rs.10,000/- are now being sanctioned from the Chief Minister Relief Fund to the bereaved families of the sunstroke victims.

The district-wise number of human casualties due to sunstroke for the year 2008-09 is given below.

#### Death due to Sunstroke

Sl.	Name of the District	No. of persons died
1	Angul	7
2	Balasore	2
3	Bargarh	5
4	Dhenkanal	9
5	Ganjam	7
6	Jagatsinghapur	6
7	Jajpur	3



8	Kendrapara	1
9	Keonjhar	1
10	Khordha	6
11	Mayurbhanj	1
12	Nayagarh	6
13	Puri	2
14	Sambalpur	5
15	Subarnapur	3
16	Sundergarh	4
<b>Total</b>		<b>68</b>

Due to acute heat-wave conditions from April to June, all drinking water sources dried up considerably. As a result, drinking water scarcity problem was noticed in almost all districts. There was huge depletion of ground water level. Water tankers were deployed in scarcity pockets. An amount of Rs.1880.00 lakh out of CRF was released in favour of various Departments in order to combat drinking water scarcity problem. The Department-wise release of funds is given below.

Name of the Department	Amount released (in lakh)
F. & A.R.D. Department	50.00
H & U.D. Department	1000.00
Rural Development Department	600.00
Health and Family Welfare Department	220.00
OSDMA	10.00
<b>Total</b>	<b>1880.00</b>

## Drought

Drought is a condition arising out of lack of moisture in the weather due to scarce rainfall and prolonged dry spells. It mostly occurs where the agriculture mostly depends on monsoon rains. The state of Orissa experienced moderate drought in some parts during the year-2008. Some districts in the State had received inadequate and deficient rainfall during



2008 monsoon period. As a result, the Kharif crop is affected causing drought like situation.

After crop cutting experiment, it was observed that in some pockets of the State, there was crop loss of 50% or more for Kharif crop due to inadequate and deficient rainfall. On the basis of the crop cutting experiment reports of Collectors, the State Government had declared 463 villages under 15 blocks and 02 wards under 02 ULBs of 05 districts (Angul, Ganjam, Malkangiri, Rayagada and Nawarangpur) as drought affected areas having sustained crop loss of 50% and above during the year 2008 (Kharif). The declaration of drought has been made by the Government in Revenue and Disaster Management Department vide Notification No. 29362/R & DM dt.23.07.2009. The district-wise crop loss figure is given in the table below.

**NO. OF VILLAGES HAVING CROSSLLOSS OF 50% AND ABOVE  
KHARIF-2008**

Sl.	Name of the District	No. of Blocks/ULBs in the District		No. of Blocks/ULBs affected		No of GPs in the District	No. of G.Ps containing affected villages	No of villages in the District
		Blocks	ULBs	Blocks	ULBs			
1	2	3	4	5	6	7	8	9
1	Angul	8	3	2		209	8	1910
2	Balasore	12	4	1		289	3	2952
3	Bargarh	12	3	5	1	248	72	1207
4	Bhadrak	7	2	2		193	32	1311
5	Bolangir	14	4			285		1794
6	Boudh	3	1			63	0	1186
7	Cuttack	14	4	13	1	342	151	1950
8	Deogarh	3	1			60		875
9	Dhenkanal	8	3			199		1215
10	Gajapati	7	2	1		129	3	1619
11	Ganjam	22	18	7	1	475	34	3212
12	Jagatsinghpur	8	2	6		194	36	1288
13	Jajpur	10	2	4		280	54	1778
14	Jharsuguda	5	3			78		348
15	Kalahandi	13	3	1		273	2	2236
16	Kandhamal	12	2			153		2546
17	Kendrapara	9	2	9	2	230	126	1587





18	Keonjhar	13	4			286		2122
19	Khurda	10	5	2		168	26	1551
20	Koraput	14	4			226		2028
21	Malkangiri	7	2	2		108	16	1045
22	Mayurbhanj	26	4			382		3950
23	Nawarangpur	10	2	4	1	169	70	901
24	Nayagarh	8	2	2		179	14	1695
25	Nupapara	5	2			109		663
26	Puri	11	4	10	1	230	124	1710
27	Raygada	11	3	1		171	7	2667
28	Sambalpur	9	5			148		1322
29	Subarnapur	6	3			96		959
30	Sundargarh	17	4			262		1764
<b>GRAND TOTAL</b>		<b>314</b>	<b>103</b>	<b>72</b>	<b>7</b>	<b>6234</b>	<b>778</b>	<b>51391</b>

Sl.	Name of the District	No. of villages sustained croploss							
		Non-irrigated				Irrigated			
		50% to 74%		75% above		50% to 74%		75% above	
		Village	Ward	Village	Ward	Village	Ward	Village	Ward
1	2	10	11	12	13	14	15	16	17
1	Angul	26	0	7	0	0	0	0	0
2	Balasore	13	0	0	0	0	0	0	0
3	Bargarh	288		42	1	47		18	
4	Bhadrak	99		25					
5	Bolangir	0	0	0	0	0	0	0	0
6	Boudh	0	0	0	0	0	0	0	0
7	Cuttack	204		303	7	76		91	
8	Deogarh								
9	Dhenkanal								
10	Gajapati	2	0	0	0	2	0	0	0
11	Ganjam	52	1			38		2	
12	Jagatsinghpur	32	0	103	0	18	0	5	0
13	Jajpur	199							
14	Jharsuguda	0	0	0	0	0	0	0	0
15	Kalahandi	2	0	0	0	0	0	0	0
16	Kandhamal	0	0	0	0	0	0	0	0
17	Kendrapara	134	0	313	0	38	0	71	0



18	Keonjhar								
19	Khordha	3	0	2	0	101	0	20	0
20	Koraput								
21	Malkangiri	0	0	0	0	27	0	5	0
22	Mayurbhanj								
23	Nawarangpur	319	1	0	0	0	0	0	
24	Nayagarh	26	0	18	0	0	0	0	0
25	Nuapada			0					
26	Puri	231	1	186	1	285	7	104	6
27	Rayagada	0	0	0	0	16	0	0	0
28	Sambalpur	0	0	0	0	0	0	0	0
29	Subarnapur	0	0	0	0	0	0	0	0
30	Sundargarh	0	0	0	0	0	0	0	0
<b>GRAND TOTAL</b>		<b>1630</b>	<b>3</b>	<b>999</b>	<b>9</b>	<b>648</b>	<b>7</b>	<b>316</b>	<b>6</b>

Sl.	Name of the District	Total		Grand Total	Remarks
		Village	Ward		
1	2	18	19	20	21
1	Angul	33	0	33	Due to flood and inadequate rainfall
2	Balasore	13	0	13	Due to flood
3	Bargarh	395	1	396	Due to flood
4	Bhadrak	124		124	Due to flood
5	Bolangir	0	0	0	No crop loss above 50%
6	Boudh	0	0	0	No crop loss above 50%
7	Cuttack	674	7	681	Due flood and heavyrain
8	Deogarh				No crop loss above 50%
9	Dhenkanal				No crop loss above 50%
10	Gajapati	4	0	4	Due to flood
11	Ganjam	92	1	93	Due to inadequate rainfall
12	Jagatsinghpur	158	0	158	Due flood and heavyrain
13	Jajpur	199		199	Due to flood
14	Jharsuguda	0	0	0	No crop loss above 50%
15	Kalahandi	2	0	2	Due to flood
16	Kandhamal	0	0	0	No crop loss above 50%
17	Kendrapara	546	10	556	Due flood and heavyrain



18	Keonjhar				No crop loss above 50%
19	Khordha	126	0	126	Due flood and heavyrain
20	Koraput				No crop loss above 50%
21	Malkangiri	32	0	32	Due to inadequate rainfall
22	Mayurbhanj				No crop loss above 50%
23	Nawarangpur	319	1	320	Due to inadequate rainfall
24	Nayagarh	44	0	44	Due flood and heavyrain
25	Nuapada				No crop loss above 50%
26	Puri	806	15	821	Due flood
27	Rayagada	16	0	16	Due to moisture stress
28	Sambalpur	0	0	0	No crop loss above 50%
29	Subarnapur	0	0	0	No crop loss above 50%
30	Sundargarh	0	0	0	No crop loss above 50%
<b>GRAND TOTAL</b>		<b>3583</b>	<b>35</b>	<b>3618</b>	

### Mild Tremor

Sometimes mild tremor is felt in different parts of the state. An earthquake of slight intensity having its magnitude 3.4 on Richter scale occurred at 06 hours 25 minutes on 27.01.2008 with its epicentre at latitude 19.0° North and longitude 84.4° East at about 200 Km from seismological observatory, Bhubaneswar. The earthquake was felt in Gajapati District. There was no loss of life and property due to this tremor.

\*\*\*



## CHPATER - IV

### Calamity Relief Fund

Expenditure on account of different calamity mitigation measures is met out of CRF at the State level. As per the procedures and norms prescribed by Government of India, a committee headed by the Chief Secretary of the State administers the fund. The fund is constituted by sharing of Central and State Government at the ratio of 75:25.

The position of both CRF and NCCF is shown in the table below

#### FUNDS POSITION

2008-09

Category of Funds	OB	Receipt	Total	Funds Released	Balance
1	2	3	4	5	6
CRF	9552.53	43265.90	52818.43	52780.53	37.90



NCCF		9886.90	9886.90	9885.70	1.20
<b>Total</b>	<b>9552.53</b>	<b>53152.80</b>	<b>62705.33</b>	<b>62666.23</b>	<b>39.10</b>

## Funds Released to Districts & Departments

2008-09

(Rs. in lakh)

Category of Funds	Receipt	OB & Unspent augmented	Total
1	2	3	4
CRF	43265.90	9552.53	52818.43
NCCF	9886.90		9886.90
<b>Total</b>	<b>53152.80</b>	<b>9552.53</b>	<b>62705.33</b>

Funds Released			Balance
District	Department	Total	
5	6	7	8
12668.89	40654.07	53322.96	37.90
-	9885.70	9885.70	1.20
12668.89	50539.77	63208.66	39.10

## Utilisation Certificate

Utilization Certificate amounting to Rs.220.80 crore has been sent to Accountant General, Orissa during the year under report against the funds provided to various Departments and Districts since 1999-00 till 2008-09.

[Rs. in lakh]

	District	Department	Total
CRF	1867.95	19290.63	21158.58
NCCF	-	921.05	921.05
<b>Grand Total</b>	<b>1867.95</b>	<b>20211.68</b>	<b>22079.63</b>

(1) An amount of Rs.3306.74 crore has been received from 1999-2000 to 2008-09 under CRF and NCFR / NCCF out of which utilization certificate to



the tune of Rs.2365.90 crore has already been furnished to Accountant General, Orissa till 31.03.2009. The table below shows the details.

[Rs in crore]

Fund	Receipt 1999-2000 to 2008-09	UC Submitted 1999-2000 to 2008-09	Percentage
CRF	2025.39	1245.74	61.49
NCCF	1281.35	1120.56	87.45
<b>Total</b>	<b>3306.74</b>	<b>2365.90</b>	<b>71.55</b>

(2) The submission of UC in respect of allotment provided to different districts and departments from 1999-2000 to 2008-09 till 31.03.09 is shown below.

## Year-wise Submission of UC

(Rs. in lakh)

Agency	1999-00		2000-01		2001-02	
	Allotment	UC Submitted	Allotment	UC Submitted	Allotment	UC Submitted
District	29840.37	29242.45	9249.63	8351.03	4545.52	3753.56
Department	18393.59	15621.77	22942.40	22557.10	21655.20	21340.16
<b>Total</b>	<b>48233.96</b>	<b>44864.22</b>	<b>32192.03</b>	<b>30908.13</b>	<b>26200.72</b>	<b>25093.72</b>

Contd..

Agency	2002-03		2003-04		2004-05	
	Allotment	UC Submitted	Allotment	UC Submitted	Allotment	UC Submitted
District	6711.04	5844.02	7396.50	5530.42	685.87	468.36
Department	13588.77	12961.60	19969.34	18946.32	25715.35	25030.22
<b>Total</b>	<b>20299.81</b>	<b>18805.62</b>	<b>27365.84</b>	<b>24476.74</b>	<b>26401.22</b>	<b>25498.58</b>

Agency	2005-06		2006-07		2007-08	
	Allotment	UC Submitted	Allotment	UC Submitted	Allotment	UC Submitted



District	3528.29	1900.60	5545.44	2504.16	4098.53	1277.43
Department	20154.60	17471.79	39309.61	31826.74	25472.53	11023.39
Total	23682.89	19372.39	44855.05	34330.90	29571.06	12300.82

Agency	2008-09	
	Allotment	UC Submitted
District	12668.89	108.10
Department	50539.77	831.00
Total	63208.66	939.10

\*\*\*

## CHAPTER - V

### Management Information System

Based on the verdict and observation of Hon'ble Supreme Court of India, arising out of Writ Petition (Civil) No.196/2001, the Management Information System for Tracking Hunger and Malnutrition came into force from 2<sup>nd</sup> fortnight of January 2003 in the State. It is the prime and foremost duty of State Government to prevent death due to starvation or malnutrition and ensure food security to needy people. Accordingly, Government of Orissa introduced a suitable policy for regular monitoring of malnutrition and hunger for ensuring Food security etc. with emphasis on Employment Generation Work, Food for Work for vulnerable population in scarcity pockets and in epidemic prone areas. In the process, individual with prolonged illness, mothers and children with malnutrition are being brought safe through this Social Security Net.



Keeping in view the guidelines and format issued on these aspects, District authorities of the State are submitting required information collecting it from grass-root level (Gram Panchayat level) twice in a month, i.e. at the end of each fortnight to Special Relief Commissioner, Orissa. On obtaining information from Collectors of Districts, compilation and analysis has been done at level of Special Relief Commissioner and evaluation of the data is made as per the prescribed indicators. As monitoring authority, advice and guidance are given to the concerned Departments of Government and all Collectors for making necessary interventions on the feedbacks from the field and submit regular compliance thereof. Thus, Management Information System has proved its utility for effective management of disaster.

\*\*\*

## CHAPTER - VI

### Disaster Management Initiatives

*Orissa State Disaster Mitigation Authority (OSDMA)*

The Orissa State Disaster Mitigation Authority takes up preparedness and mitigation activities at different levels in the State. In the aftermath of the Super Cyclone, many reconstruction activities were undertaken along with host of preparedness measures to strengthen the overall disaster management system. A brief sketch of the major activities so far taken up by OSDMA is given below.

#### RECONSTRUCTION

Reconstruction works were taken up with assistance from Prime Minister's National Relief Fund (PMNRF), Chief Minister's Relief Fund (CMRF), World Bank, Department for International Development (DFID), Eleventh Finance Commission (EFC) and Calamity Relief Fund (CRF), contribution of other State Governments, etc.





1. **Embankment:** Flood embankments to a combined length of about 877 km and canal embankment of 332 km has been raised/ strengthened with World Bank assistance. 82 spurs and 19 sluices have been renovated/ reconstructed. 72.47 km of irrigation embankment have been strengthened under Calamity Relief Fund (CRF) assistance.
2. **Road:** 275 km of roads have been repaired and renovated under Works Department, 448 km of road under Rural Development Department and about 85 km of urban road under Housing and Urban Development Department have also been reconstructed with World Bank assistance. About 5 km of urban road and 28.46 km of road under Works Department have been reconstructed with assistance from CRF.
3. **Water Supply:** Works in respect of installation of pump sets, construction of bore wells and tube wells and laying of pipe lines were undertaken in 20 urban locations in the cyclone-affected districts with World Bank assistance. Similar works were also undertaken in 64 rural locations.
4. **Agro Service Centres:** 500 Agro Service Centres have been set up with World Bank assistance.
5. **Education Infrastructure:** 8,890 primary school buildings and 1152 high school buildings have been constructed with assistance from DFID, PMNRF, CMRF, MPLADS, NFCR, OBB, other State Governments, NGOs and donors. These school buildings will be used as flood and cyclone shelters.
6. **Health Infrastructure:** 216 health institutions have been improved with assistance from CMRF.
7. **Lift Irrigation:** 2555 Lift Irrigation points have been revived with DFID support.

## **PREPAREDNESS MEASURES**

### **Multi-purpose cyclone shelters**

117 large size multi-purpose cyclone shelters (MCSs) have been constructed along the coast under Chief Minister's Relief Fund and World



Bank funding. These buildings have been handed over to the Cyclone Shelter Management and Maintenance Committees (CSMMCs).

A sum of Rs.15.00 crore has been sanctioned out of Prime Minister's National Relief Fund for construction of 42 more cyclone shelters in coastal districts of Balasore, Bhadrak and Kendrapara. Out of these, work of 32 cyclone shelters is under progress.

### **Communication-**

- a. A dedicated civil VHF network has been set up to link Blocks, Tahasils and some vulnerable Gram Panchayats with the District headquarters. VHF connectivity



has also been provided to the State Emergency Operations Centre, OSDMA, ODRAF Units, IMD, Bhubaneswar and All India Radio, Cuttack. 414 VHF base stations have been commissioned and 36 vehicle mounted VHF stations installed in the office vehicles of Collectors, SRC and OSDMA. 140 VHF handsets have also been provided.



- b. 30 satellite phones have been provided to the Collectors to establish contact when all other means of communication fail. 5 more are available with disaster managers at the state level.

- c. Toll free numbers "1077" & "1070" have been installed in the emergency operation centres at district and state levels respectively.

- d. 21 Amateur (HAM) Radio stations have been installed at different locations in the State. Training on HAM Radio operation has been provided to volunteers.

### **Orissa Disaster Rapid Action Force-**



With a view to providing assistance to civil administration in search and rescue operations and relief line clearance during disasters, Orissa Disaster Rapid Action Force (ODRAF) units have been created out of the personnel of Orissa Special Armed police (OSAP) and Armed Police Reserve (APR)



units. Five ODRAF units have been set up at Cuttack, Chatrapur, Koraput, and Jharsuguda & Balasore. The ODRAF units have been provided with state of art search and rescue equipment and training. In view of the effectiveness of the ODRAF units in disaster response activities, five more ODRAF units are being set up at Bhubaneswar, Baripada, Rourkela, Bolangir and Paradeep.

The details of the equipment available with the ODRAF units are provided in table below.

#### EMERGENCY EQUIPMENT AVAILABLE WITH FIVE ODRAF UNITS

Sl.	Equipments	Quantity	ODRAF UNIT				
			Cuttack	Jharsuguda	Koraput	Chhatrapur	Balasore
1.	Hydraulic Crane 12 Ton capacity	8 nos.	4	1	1	1	1
2	TATA Truck- ( <i>Troop Carrier</i> )-6 Ton capacity	10 nos.	2	2	2	2	2
3	TATA Truck 12Ton capacity	6 nos.	2	1	1	1	1
4	Generator 5 KVA	13 nos.	5	2	2	2	2
5	Generator 10 KVA	10 nos.	2	2	2	2	2
6	Concrete Cutting equipment	5 nos.	1	1	1	1	1
7	Power saw with Portable Power Unit	10 nos.	2	2	2	2	2
8	Tree Pruner-cum-Chain saw	8 nos.	4	1	1	1	1
9	Water Filter Portable	20 nos.	10	3	3	2	2
10	Ramp-2 Ton capacity (fabricated) M.S.	16 nos.	4	4	4	2	2
11	Telescopic Aluminium Ladder (40 feet long)	20 nos.	8	3	3	3	3
12	Life Jacket	110 nos.	60	20	10	10	10



13	Life Buoy	110 nos.	60	20	10	10	10
14	Chain Power Saw (Stihl 026 Model)	6 nos.	2	1	1	1	1
15	Tractor with trailer	6 nos.	2	1	1	1	1
16	Inflatable Tower Lighting system with Generator	6 nos.	4	1	1		
17	Branch Cutting Saw (Electric Motor Drive)	7 nos.	3	1	1	1	1
18	Branch Cutting Saw (Petrol engine driven)	14 nos	6	2	2	2	2
19	Commando Search Light	20 nos. 4 nos. Infrared.	12 4 IR	2	2	2	2
20	Mahindra & Mahindra FJ-460-DP/4WD Ambulance.	1 nos.					
21	TATA SFC-407/31, AMBULANCE	3 nos.	1	1	1		
22	G.I.Trunk-	70 nos.	40	10	8	6	6
23	Wire Ropes & Slings	12 sets	4	2	2	2	2
24	Lifting & Pulling Machine	4 nos.	4				
25	Battery Chargers	11 nos.	3	2	2	2	2
26	Small Tools & Jack	12 sets	4	2	2	2	2
27	Nylon Rope	600 Kg	300	150	150		
28	Hydraulic Tipper	5 nos.	1	1	1	1	1
29	Recovery Van/Wreckage Crane	5 nos.	1	1	1	1	1
30	Small rescue items like, rope, carabiner etc.	2 sets	2				
31	Submersible Pump	15 nos.	3	3	3	3	3
32	Breathing Apparatus	27sets	7	5	5	5	5
33	Diving Equipments	12 sets	4	2	2	2	2
34	Diving Helmet	5 sets	1	1	1	1	1
35	Chain Sharpener	2 nos.	2				
36	Combi tool	5 sets	1	1	1	1	1
37	Cutter	5 sets	1	1	1	1	1
38	Inflatable Rubber Dinghies with OBM	60	32	6	6	8	8
39	Hydraulic spreader	5 nos	1	1	1	1	1
40	Telescopic Ram Jack with Extension	5 sets	1	1	1	1	1
41	Fork lift 3 tonne capacity	6 nos	2	1	1	1	1
42	RCC cutting chain saw	5 nos	1	1	1	1	1
43	Gas mask with chemical cartridge	65 sets	25	10	10	10	10



44	Pay loader-cum-excavator	5 nos.	1	1	1	1	1
45	Air compressor	3 nos.	11	1	1		
46.	125 KVA Truck Mounted Generator	5nos.	1	1	1	1	1
47.	Single Phase Welding Transformer with Accessories	5 sets	1	1	1	1	1
48.	Reciprocating Pump-cum-Vehicle Washer	5 sets	1	1	1	1	1
49.	Air Compressor with Tyre-Inflator with accessories	5 sets	1	1	1	1	1
50.	Wooden Stand for OBM	60 nos.	20	10	10	10	10
51.	Fire Extinguishers	48 nos.	16nos	8	8	8	8
52.	Stretchers	10	2	2	2	2	2
53.	Patient Carrying Trolley	10	2	2	2	2	2
54.	Gas Cutting sets	5 sets	1	1	1	1	1
55.	M.F.R. Kits	7 sets	2	1	1	2	1
56	Collapsed Structure Search and Rescue (CSSR) Kit	5 sets	1	1	1	1	1
57	Flexi tents	10 nos.	2	2	2	2	2
58	Poly propylene YV treated tarpaulin	50 nos.	10	10	10	10	10

**Emergency Operation Centres (EOC):** EOCs at the State and district levels have been strengthened with provision of computers, fax and other communication & life saving equipment. Construction of multi-hazard resistant buildings for 18 District Emergency Operation Centres and one State level EOC has been completed. Funds have been sanctioned for construction of similar buildings in remaining districts.

**Geographic Information System (GIS) -** A GIS Cell has been set up in OSDMA to function as a decision support system for effective management of disasters. The cell is equipped with required hardware and software. OSDMA is in the process of developing the GIS database for the entire State in coordination with Orissa Space Application Centre (ORSAC). The digital data obtained from ORSAC in addition to the data developed by OSDMA are utilized for taking up preparedness planning and mitigation initiatives for management of disasters. OSDMA coordinates with different Govt. Departments and agencies for generating specific data pertaining to their



work. GIS has been effectively used in the following cases as a decision support tool.

- Identification of location for construction of multipurpose cyclone shelters.
- Grid analysis for setting up the Automated Weather Stations (AWS).
- Preparation of the district and grampanchayat level vulnerability maps.
- Strengthening of embankment and repair of roads.
- Identification and demarcation of weak points in the embankments, area to be affected by flood for preparedness planning.
- Preparing the base map indicating location and operation of boats and deployment of rescue personnel.
- GIS was extensively used as a part of the Incident Command System and Decision Support System during the Air dropping operations in the management of floods in 2007 and 2008.
- Project monitoring, implementation, assessment and evaluation.
- GIS has been utilized in the preparation of the project proposals under National Cyclone Risk Mitigation Project (NCRMP) which is being implemented by OSDMA.

**Earthquake Observatories-** Sites have been selected at Lakhanpur (Jharasuguda district) and Kolanara (Rayagada district) by IMD to set up V-sat based Earthquake Observatories. The building at Kolanara Block of Rayagada district has been completed in all respect for setting up the equipment. IMD is in the process of procuring the required equipment for the observatories.

## **CAPACITY BUILDING ACTIVITIES**

### **Gol-UNDP Disaster Risk Management Programme**

Gol-UNDP Disaster Risk Management Programme is being implemented in 155 blocks (23263 villages, 3210 GPs, 58 ULBs) of 16 districts such as Angul, Balasore, Bhadrak, Cuttack, Ganjam, Jajpur, Jagatsinghpur,



Kendrapada, Khordha, Keonjhar, Koraput, Mayurbhanj, Nuapada, Puri, Rayagada and Sambalpur. Under the programme, Disaster Management Committees have been formed in all the districts and blocks. Members of Panchayati Raj Institutions have been oriented at different levels. 6567 volunteers of 155 blocks have been trained in preparation of village disaster management plans. 673 block level master trainers have been trained in search and rescue through Civil Defence Organisation; 856 master trainers have been trained in first aid through St. John Ambulance; 719 block and district level trainers have been trained in disaster mental health in collaboration with American Red Cross; 7391 teachers have been oriented at district and block levels. Disaster Management Plans have been prepared in 154 blocks, 2470 GPs and 19258 villages.

#### **Urban Earthquake Vulnerability Reduction Programme (UEVRP)**

Urban Earthquake Vulnerability Reduction Programme (UEVRP), a sub-component of the Disaster Risk Management Programme, is being implemented in three cities of Bhubaneswar, Cuttack and Sambalpur, which come under seismic vulnerability zone (Zone-III). Activities like awareness generation, response planning, capacity building, and implementation of techno-legal regime are being taken up under the project. City Disaster Management Committee (CDMC) under the chairmanship of Revenue Divisional Commissioner. City Awareness Committee (CAC) under the chairmanship of Municipal Commissioner/ Executive Officer and City Enforcement Committee (CEC) under the leadership of Vice Chairman of the local development authority have been constituted in each programme city to support the CDMC in implementation of different activities under the programme.

#### **National Programme for Capacity Building of Engineers in Earthquake Risk Management (NPCBEERM)**

National Programme for Capacity Building of Engineers in Earthquake Risk Management (NPCBEERM) is being implemented in the State for capacity building of serving as well as privately practising engineers in earthquake resistant designs and construction of buildings. 13 faculty



members of 4 State Resource Institutions have been trained at IIT, Kharagpur. 190 Govt. and 130 privately practising civil engineers are proposed to be trained under the programme. 1<sup>st</sup> round of training programmes have been conducted by the State Resource Institutions.

### **National Programme for Capacity Building of Architects in Earthquake Risk Management (NPCBAERM)**

National Programme for Capacity Building of Architects in Earthquake Risk Management (NPCBAERM) is being implemented in the State for capacity building of Govt. as well as privately practising architects in earthquake resistant design and construction practices. 4 faculty members of Two State Resource Institutions have been trained at National Resource Institutions. Two training programmes have been conducted by the State Resource Institutions.

OSDMA in association with UN agencies, NGOs and State level Training Institutions is organizing workshops and training programmes for capacity building of the officials at state / district / block level, Panchyati Raj Institutions and NGOs involved in disaster management.

District level training of civil engineers has been taken up by OSDMA on earthquake resistant design for construction of buildings. 1550 civil engineers have been trained.

### **POLICY PLANNING INITIATIVES**

State Disaster Management Policy has been enacted for the State. Draft Disaster Management Plan of the State has been prepared.

A web-based database on resources available with Government agencies/ PSUs/ members of Confederation of Indian Industries (CII) has been developed under India Disaster Resource Network (IDRN). All the 30 districts have uploaded the information, and are updating the same regularly.





A high level committee under the chairmanship of Development Commissioner-cum-Additional Chief Secretary is examining the recommendations of the National Expert Committee on building byelaws etc for its implementation in Orissa. A core group under the leadership of National Engineering Consultant UNDP is working on modification of the building byelaws etc. Drafts modifications in the relevant rules and regulations for seismic resistant construction practices prepared by OSDMA have been submitted to Government in H. & UD Department for consideration and implementation.

Hazard Safety Cell has been constituted by the Government in Works Department under the chairmanship of Chief Engineer (Design) to aid and advise the Govt. regarding construction of earthquake resistant buildings.

Board of Secondary Education, Orissa has included disaster management themes in the syllabus of Class-VIII.

Biju Patnaik University of Technology (BPUT) has been requested to include Disaster Management in the course curriculum of the Engineering colleges of the State.

OSDMA has been identified by the Ministry of Home Affairs, Govt. of India as a partner institution in the India Disaster Knowledge Network (IDKN), which is a knowledge based web portal for disaster management.

#### **IEC ACTIVITIES & PUBLICATIONS**

1. Orissa State Disaster Mitigation Authority publishes quarterly newsletter **The Response** which carry articles and write-ups on matters related to disaster preparedness and mitigation activities at different levels, strategies worked out in other countries for coping with disasters, etc.
2. The OSDMA has brought out several publications, posters, booklets, etc for generating awareness on disaster preparedness.



3. It has produced short video films on disaster related subjects for awareness and training.
4. Other awareness generation activities of OSDMA include wall paintings, telecast and broadcast of jingles in electronic media and articles/ advertisements in print media.

### National Cyclone Risk Mitigation Project (NCRMP)

Investment proposal for the Government of India- World Bank assisted National Cyclone Risk Mitigation Project (NCRMP) has been submitted to National Disaster Mitigation Authority (NDMA). The project will be implemented within 10 km of sea coast in the coastal districts of Balasore, Bhadrak, Kendrapara, Jagatsinghpur, Puri & Ganjam. The Government of India will provide 75% of the Project cost as grant and the State Government will bear 25% of the project cost. Construction of multipurpose cyclone shelters, construction of connecting roads to the proposed and existing cyclone shelters and raising and strengthening of saline embankments are major components under the project. Investment proposals for Rs.576.12 crore have been submitted to NDMA as per the component allocation detailed below.

(Rs. in crore)

Sl. No.	Components	Total	Year-I	Year-II	Year-III
1.	Construction of multi purpose Cyclone Shelters	164.60	54.54	80.87	29.19
2.	Shelter connectivity	246.52	113.15	133.37	-
3.	Raising and strengthening of Saline Embankment	165.00	4.50	71.39	89.11
<b>Total</b>		<b>576.12</b>	<b>172.19</b>	<b>285.63</b>	<b>118.30</b>



The normal project implementation period is 5 years. Since the project implementation has been delayed, in our Investment Proposal we have suggested a 3-year time limit for implementation. The Detailed Project Reports are being prepared and other preparatory works are in progress. The sub-projects, which are coming under Coastal Regulatory Zone (CRZ), have been proposed in Year-II and Year-III. Environmental and Social Screening of the Year-I projects has been completed.

The project has not yet been sanctioned. NDMA has indicated that the project is likely to be sanctioned in the current financial year.

\*\*\*

## Conclusion

Orissa is prone to various natural calamities due to its unique geo-climatic conditions. Natural calamities are stories of nightmare mingled with astonishing instances of human resilience and courage, of compassion and solidarity. Sometimes the devastation is worse than our worst fears. The lessons learnt from the large number of natural disasters that occurred during the past years, guide the way we prepare and respond to disasters. With the kind of economic losses and developmental setbacks, the State has been suffering year after year due to natural calamities. Going beyond the age-old focus on relief and rehabilitation, we have gone into disaster preparedness and mitigation in order to minimize the periodic shocks to our development efforts that the disasters bring in.



❧❧❧