

Maharashtra Floods 2005

Relief and Rehabilitation Government of Maharashtra

The 2005 monsoon proved to be extremely erratic for Maharashtra. In the beginning, a serious deficiency of rainfall, particularly in the western Vidarbha and Marathwada, created a drought-like situation with shortage of drinking water and fodder. The situation changed dramatically in the course of a week from July 21, when unusually heavy rains lashed the coastal areas of Konkan and Western Ghats. It caused extensive flooding in Raigad and Ratnagiri districts, with many towns and villages under waters. On July 26, when the highest ever rainfall recorded in the last 100 years in the country battered the sub-urban Mumbai and Thane, Maharashtra experienced one of the worst floods in its history. The downpour was heavy in other parts of the state too, particularly in Nanded and Parbhani. Soon the Godavari was in spate, flooding a large number of towns and villages. No sooner did the flooding recede in Konkan and Marathwada, the release of water from the Koyana and Ujani dams flooded Sangli, Kolhapur, and Solapur districts.



It has indeed been a state-wide disaster, leaving a trail of destruction and devastation in many districts. People have lost enormously, and they are struggling to cope with its impact.

Excessive Rainfall and Flash Flooding

The rainfall data for 24 hours from 0830 of July 26 to 0830 of July 27, provided by the Indian Meteorological Department, is presented as below:

Rainfall in the city of Mumbai

	Santacruz (in mm.)	Colaba (in mm.)
0830-1130	0.9	0.0
1130-1430	19.3	7.0
1430-1730	400.1	26.5
1730-2030	667.7	33.1
2030-2330	768.8	-
2330-0230	885.0	-
0230-0530	896.0	57.1
0530-0830	944.2	73.4

It shows that within a period of 18 hours, there was a precipitation of 944 mm. in Mumbai sub-urban area, a phenomenon which never occurred before. Thane district also received more than 700 mm. of rains in a single day. The exceptional rainfall coincided with high tide, which brought a large area in Mumbai and Thane under massive inundation.

Mumbai: It was a case of urban flash flooding. Water levels rose rapidly within three-four hours, submerging the roads and railway tracks. The traffic was completely immobilized. All the low-lying areas in the city were heavily flooded. The poor who lived in Jhuggis in these areas were the worst victims. It also hit the middle and upper class segments. All the ground floor flats were under water, and the people lost all their possessions—electronic goods, furniture, clothes and utensils.

Flooding crippled the basic services and lifelines in the city. There was no electricity in Mumbai sub-urban and Thane districts. As the telephone exchanges came under water, the phones stopped working. Mobile phones were also not accessible. As a result, the people who were stranded could not access information, and were subjected to terrible hardship. The Western and Central Railways did not run their local services for a number of days. The local services on the Central line have not yet been fully restored even today. All the long-distance trains run by the Central Railways were cancelled. The tracks on the Konkan Railways are badly damaged, and it would take many days before the

trains could run again on these tracks. The national and international flights at the Sahar and Santacruz were disrupted for a number of days.

Thane: In Thane district, the flooding affected all the urban centers. Kalyan, Dombivali, Ambarnath, Ulhasnagar, and Bhiwandi, which are part of the urban agglomeration, were under flood waters. Heavy rainfall in the catchment area filled up almost all the reservoirs in Thane district. The release of water from these reservoirs caused the water levels to rise further and aggravate the flooding. Despite a respite from the rains, the water level in these towns did not reduce.



Raigad and Ratnagiri: In Konkan, Raigad and Ratnagiri districts had large areas under submergence. The towns which are severely affected by floods are Roha, Mahad, and Mangaon in Raigad district, and Khed and Chiplun in Ratnagiri district. A large number of villages were cut off by the floods.

In Raigad and Ratnagiri, the heavy rainfall triggered landslides. There were at least six villages in Raigad and Ratnagiri, where landslides caused deaths. In village Jui, near Mahad in Raigad district, more than 100 people died due to the collapse of houses under the impact of a major landslide. A massive search and rescue operation was conducted in all the villages to extricate dead bodies from the debris.

The Mumbai-Goa National Highway was cut off at many points due to large tracts came under water. As a result, the traffic on this highway was completely disrupted. The Konkan Railways had also come under submergence at many places. A number of trains were stranded at different stations. The Government made the arrangements for evacuating the passengers from these trains.



Marathwada: In Marathwada, Parbhani and Nanded districts experienced severe flooding. In Parbhani, the river Dudhna was in spate—it was the worst flooding in the last 100 years-- cutting off more than 20 villages. The Indian navy deployed boats to evacuate the people from these villages. In Nanded, almost all the Talukas including the district headquarters were seriously affected by a rise in water levels in the Godavari. It was the Indian Air Force which came to the rescue of the people here by dropping food packets in the area cut off by the floods.

Western Maharashtra: Sangli and Kolhapur districts were extensively flooded by the release of water from the Koyna, Warna, and other dams in the region. The backwater effect of the Almaty dam in Karnataka did not allow flood waters to recede from the Sangli and Kolhapur district. In Solapur district, the famous pilgrimage, Pandharpur, was flooded by the release of water from the Ujani and Vir dam. Patan and Karad in Satara district suffered losses from floods in the Koyna river. Release of water from dams near Pune inundated low-lying areas in Pune, Pimpri Chinchwad, and many other villages.

Loss of Human Life

In terms of human lives lost, it has been one of the worst disasters. Floods claimed almost 1,100 lives in the state, most of them coming from urban concentrations of Mumbai and Thane. In rural areas, Raigad reported the highest number of deaths, 166, most of which were caused by landslides. The number of missing persons is 54, while 167 people received various kinds of injuries. The total number of deaths reported from different districts of Konkan and other districts are as follows:

District-wise number of deaths in Maharashtra (August 12, 2005)

Sr.no	District	Death	Injured	Missing
1	Mumbai	447	16	--
2	Mumbai (Railway)	7	4	14
3	Navi Mumbai	66	22	1
4	Thane	180	19	3
5	Thane (Rural)	44	--	12
6	Raigad	166	4	3
7	Ratnagiri	20	--	--
8	Sindhudurg	8	5	--
9	Kolhapur	26	21	12
10	Parbhani	6	3	-
11	Nanded	13	3	--
12	Yeotmal	11	13	--
13	Satara	11	5	1
14	Aurangabad (Urban)	1	--	--
15	Aurangabad (Rural)	6	0	--
16	Beed	7	11	--
17	Jalana	2	2	--
18	Hingoli	1	2	--
19	Wardha	3	6	1
20	Pune (Urban)	9	--	--
21	Pune (Rural)	10	3	3
22	Nasik(Rural)	--	--	1

23	Bhandara	2	--	-
24	Washim	2	1	--
25	Amaravati (Urban)	2	5	--
26	Amaravati (Rural)	6	11	--
27	Sangli	13	10	1
28	Nadurbar	6	--	--
29	Akola	2	--	--
30	Nagpur (Urban)	1	--	--
31	Nagpur (Rural)	6	1	1
32	Latur	1	-	-
33	Chandrapur	5	-	1
34	Ahmednagar	2	-	-
35	Dhule	2	-	-
	Total	1094	167	54

Damages and Losses

The Government has commenced an assessment of damages and losses caused by floods. The details of these damages and losses are being compiled at the district-level. All the departments have also been directed to report their losses and damages.

Agriculture: In agriculture sector, approximately 5.5 lakh hectares of land have suffered crop losses, though this figure is expected to increase. Almost the entire Kharif crop in the Konkan region has been destroyed by the flooding. The loss to the sugarcane crop in western Maharashtra is also extensive, which would have a major impact on the production of local sugar mills. More than 20,000 hectares of land have become waste due to the top soil having been washed away, which would require considerable investment for being reclaimed. Farmers cannot re-sow their crops in the entire region.

Cattle Losses: The total number of cattle losses in the floods is 26,339. The worst affected was Mumbai itself where more than 15,321 cattle losses were reported, followed by Ratnagiri (3,983), Raigad (2,783), Thane (1,285), and Parbhani (1,153). A large number of buffaloes died in Mumbai and Thane, causing a serious loss to the local milk-selling industry.



Housing: People have lost their houses in large numbers. As per the latest reports, 357,917 houses are partially damaged, while 14,142 houses are completely damaged. As the reports of these damages from the districts are still coming, the figure is likely to increase. The district-wise figures for damages to housing are produced below:

Damage to Housing

Sr. No.	District	Houses Damaged			
		Partially	Cost (in lakhs)	Fully	Cost (in lakhs)
1.	Mumbai	2	1	0	0
2.	Mumbai Suburban	174,885	29,800	2,000	800
3.	Thane	65,727	2,129	1,496	598
4.	Raigad	4,311	435	8,29	332
5.	Ratnagiri	3,694	783	243	358
6.	Sindhudurga	856	37	34	6
7.	Pune	3,755	235	150	30
8.	Satara	7,132	416	182	101
9.	Sangli	28,366	346	6,155	46
10.	Solapur	1,015	61	44	6
11.	Kolhapur	18,458	1,155	412	115
12.	Parbhani	36,726	480	1,153	71
13.	Nanded	12,990	270	1,444	144
	Total	357,917	36,148	14,142	2,607

Infrastructure and Public Utilities: Floods have caused massive losses to the infrastructure and public utilities. In the education sector, more than 20,000 classrooms have been damaged, and 97 school buildings have collapsed. About 437 Primary Health Centers, rural hospitals, and residential premises for health personnel have been damaged by flooding. The Public Works Department has estimated that it would require Rs. 1,200 crores for repairing roads and bridges damaged by flooding. The Maharashtra State Electricity Board has suffered huge losses—5,667 of its transformers were affected, 12 high-tension towers fell and 14 small distribution stations were flooded. Water supply schemes in both the urban and rural sectors have suffered extensive damages. The sector-wise losses, many of which are still not available, are shown in the following table:

Sector-wise Flood Losses (Compilation in progress)

Sr.No.	Sector	Asset Losses	Output Losses	Fiscal Losses	Cost of Temporary Restoration	Total Losses
1	Agriculture	410.6493	624.0906	0.0400	204.7880	1239.5679
2	Animal Husbandry, Dairy Development and Fisheries	719.4670	227.0700	4.6150	24.9070	976.0590
3	Co-operation ,marketing And Textiles	382.3780	1.3900	0.0000	0.0180	383.7860
4	Finance	0.0275	0.0000	0.0000	0.0000	0.0275
5	General Administration	0.2670	0.0000	0.0000	0.0000	0.2670
6	Home	147.9748	11.6203	0.0000	0.0048	159.5999
7	Public Health Dept.	10.6600	0.0000	0.0000	43.6500	54.3100
8	Public Works Dept. (Roads & Building)	617.1600	0.0000	0.0000	320.7900	937.9500
9	Public Works (National Highway)	139.2900	0.0000	0.0000	24.3850	163.6750
10	Rural Development and Water Conservation	718.8300	0.0000	0.3700	21.8800	741.0800
11	School Education Dept.	17.1040	0.0000	0.0000	0.0000	17.1040
12	Urban Development	580.7375	17.3681	513.7326	36.0989	1147.9371
13	Water Resources	501.2320	0.0000	7.0650	2.8900	511.1870
14	Water Supply & Sanitation	47.7077	3.9155	4.5608	6.1026	62.2866
Total		4293.5648	885.4545	530.3834	685.5143	6394.9170

Trade and Commerce: The most extensive loss has been suffered by the trade and commerce sector. A large number of shops, commercial establishments, and warehouses have suffered heavy losses due to flooding. The Indian Merchants Chamber has pegged these losses at Rs. 5,000 crores.

Rescue and Evacuation:

The Government mounted a large-scale rescue and evacuation operation in all the areas affected by floods. It deployed the Army, Air Force and Navy for the search and rescue operations. A large number of boats were deployed by both the Army and Navy for rescuing people in all the districts including Mumbai. In many districts, like Sangli and Kolhapur, the naval boats were transported by the IAF aircrafts and helicopters. About six army columns were deployed in these districts for the rescue operations. The IAF planes and helicopters were used for dropping food packets.



Further, the Government requisitioned a huge number of buses and trucks for evacuating people from marooned villages. About 5.5 lakh people were evacuated to safer places. The food and drinking water for all the evacuated people were arranged with the help of NGOs and other local organizations. About 1.94 lakh people are still in camps, and the government is providing foodgrains for all the community kitchens being run for these

camps. The Government also provided free of cost foodgrains to all the people affected by the floods. The district-wise figures for evacuation are as follows:

District-wise Evacuation of Flood-affected People

District	Population Evacuated	Population Sent back	Population Still in Camps
Kolhapur	92,811	62,734	30,077
Satara	16,028	15,641	387
Sangli	212,836	94,000	118,836
Pune	90,579	51,145	39,434
Solapur	82,172	81,955	217
Parbhani	1,200	12,00	0
Nanded	25,000	25,000	0
Raigad	10,112	4,688	5,424
Jalna	5,500	5,500	0
Beed	6,000	6,000	0
Total	542,238	347,863	194,375

Sanitation, Health and Medical Care

In the wake of floods, water-borne diseases are likely to break out. The Government has taken a number of precautionary measures to contain the incidence of these diseases. It took a sanitation drive by which more than 1000 dumpers and JCBs were deployed in all the flood-affected areas for disposing of animal carcass and garbage. In the city of Mumbai, more than 1 lakh ton of garbage was lifted in three days following the floods. The Government deployed senior government officials in all the affected sub-urban towns to oversee the rescue, relief and sanitation drive.

The Government has made special effort to ensure the quality of drinking water. It has provided a large number of chlorine tablets and ORS packets to all the municipal authorities for supplying clean drinking water. Due to its prompt public health intervention, the incidence of water-borne diseases such as cholera and gastro-enteritis has largely been contained. About 1,253 medical teams have been deployed in all the districts for medical check-ups and sanitation programs. In Mumbai, 133 medical teams are working in different areas for contain diseases in the flood-affected areas. Doctors have been called from other districts and private medical colleges.

The incidence of leptospirosis in Mumbai and Kalyan-Dombivali is, however, a subject of serious concern. People get the disease when they wade through flood waters infected with animal urine. The period of incubation for this disease is about 10 days. In Mumbai

and Kalyan, a large number of such cases have been reported. About 97 people have died. The Government has issued advisories for treating leptospirosis and made arrangements for beds in all the government and private hospitals for treating the patients. The government is providing doxycyclines in large quantity for treating the disease. It is also procuring ventilators for giving immediate support to the critical patients in various hospitals of Mumbai.

In Mumbai city, the reported cases of various diseases, admissions in hospitals and deaths are shown in the following table:

Epidemiological Surveillance in Mumbai

Name of the disease	Admission in last 24 hrs.	Total admissions since 29th July	Number of deaths
Gastroenteritis	154	1318	1
Hepatitis	27	194	--
Enteric fever, Typhoid	5	53	--
Malaria	62	406	2
Dengue	5	49	--
Leptospirosis	56	197	10
Fever (Unknown cause)	597	1,044	45
Total	906	3,261	57

Relief and Rehabilitation

The Government has organized relief measures for the flood-affected areas on a large-scale. These measures are listed as below:

- It undertook to distribute 20 kilogram of foodgrains and 10 liters of kerosene oil to all the flood-affected families free of cost. Since most of the flood-affected people lost their ration cards, it was decided that foodgrains and kerosene oil would be distributed without asking for ration cards. The Government has just completed the first round of distribution of foodgrains through an open system of distribution.
- The Government would soon resume the distribution of foodgrains through ration shops. It is distributing coupons to the people for getting the foodgrains free of

cost. The government is seeking to involve the NGOs in the distribution of foodgrains.

- The Government has also decided to provide foodgrains free of cost for the community kitchens which are being run by the NGOs and other organizations. In Mumbai, the Government provided two tons of foodgrains to each NGO running community kitchens.
- The Government has decided to distribute *ex gratia* assistance at the rate of Rs. 1,000 per person for the people who lost their possessions in the floods. The Government has so far distributed Rs. 210 crores as *ex gratia* assistance to the flood-affected population in different districts. It is estimated about 8 lakh families are badly affected by floods, and the total amount that may have to be disbursed may go up to Rs. 400 crores. The district-wise distribution of foodgrains and *ex gratia* assistance is shown in the following table:

Statement of flood Damages & assistance given (25th July to 12th August, 2005)

S.N.	District	Villages affected / Towns	Assistance for Human loss		Destitute Families	Destitute Persons	Gratuitous Relief	Value in Lakh Rs.			Kerosene Distributed (In Kilo Ltr.)
			No.	Rs.				Wheat	Rice	Total foodgrain	
1	Mumbai	1	12	10.50	13438	17295	172	47032	80452	127484	5610
2	Mumbai suburban	1	406	227.00	85384	824890	7485				
3	Thane	419	246	119.00	173728	875900	7090				
4	Raigad	559	221	28.00	70532	349493	2520	4681	4682	9363	406
5	Ratnagiri	446	23	10.50	9788	47947	750	718	1027	1745	70
6	Sindhudurga	299	3	1.00	79	451	9	60	62	122	6
7	Pune	674	14	4.00	19196	99135	726	414	414	828	36
8	Satara	887	10	5.00	4201	17918	48	391	392	783	38
9	Sangli	329	6	1.50	52399	194000	303	2365	2365	4730	82
10	Solapur	89	0	0.00	18461	82172	72	1769	1769	3538	118
11	Kolhapur	981	23	20.00	28508	136628	835	2153	2154	4307	172
12	Parbhani	656	7	2.50	3662	16789	168	359	359	718	34
13	Nanded	750	13	11.00	6853	110000	914	1796	1797	3593	180
	Total	6091	984	440.00	486229	2772618	21090	61738	95473	157211	6752

- The Government has decided to provide text books to the children who lost them during the floods. The work of distributing text books would begin this week. About 7 lakh children are being provided text books in the government, municipal and even unaided schools. The Government is also in touch with the donors and NGOs for distributing school bags and note books.



- The Government is coordinating with the NGOs for effective channeling of relief and rehabilitation. It has set up a coordination committee at the government level to ensure that all the relief assistance is provided to the people transparently.
- The Government has released Rs. 5 crores to every district affected by floods to undertake emergency repairs to the schools, primary health centers, roads, bridges, and water supply schemes.
- The Government has started distributing assistance for partially and fully damaged houses as per the standing orders. However, a number of villages and settlements which are in the areas prone to frequent flooding and landslide would have to be relocated. The Government would provide a package for relocation of

all such villages and settlements. In the meanwhile, the Government has also decided to provide transit shelters to the people rendered homeless by the floods.

- The Government has decided to provide assistance to the shopkeepers and stall-owners after making an assessment of their damages. Similarly, the Government would provide assistance to the farmers who have lost more than 50 percent of their crops. It has already started distributing seeds and fertilizers to the farmers who would like to re-sow. The Government has provided Rs. 10 crores for the distribution of seeds and fertilizers.
- The Government has set up a Chief Minister's Relief Fund for Flood Relief and Rehabilitation. The Government has appealed to the people to contribute liberally to this fund. The members of the Cabinet and State Legislature have decided to contribute their one-month salary to the Fund. All the government employees have pledged their one-day salary to the fund.
- The Government is also coordinating with insurance and banking sector to provide immediate relief to the shopkeepers, traders and entrepreneurs. The Chief Minister convened a meeting of the insurance companies and requested them to settle insurance claims on a fast track basis.
- The Chief Minister also convened a meeting of state level bankers committee and impressed upon them to help the flood-affected farmers and small traders in terms of rehabilitation of their outstanding loan and disbursement of fresh loan on easy terms. The bankers have decided to convert all short term crop loans to medium term to be repaid in five years after an initial moratorium period of two years. The rescheduled repayment if done in time will not attract any interest. The outstanding loans of small traders up to 50,000 in Mumbai and Thane urban agglomeration or up to 25,000 in other small towns and villages will be rescheduled in the same manner as above and the repayment if done in time will not attract any interest.

Long-term Vulnerability Reduction

In the wake of flooding, the Government has decided to set up a **Fact Finding Committee** of experts to look into the causes of flooding. The committee would undertake to study all the factors which contributed to flooding in the city.

Further, the city has become extremely vulnerable due to a large number of people living in huts in low-lying areas, particularly in the bed of Mithi river. The Government has set up a **Mithi River Development Authority** to undertake removal of encroachment upon this river and improve its drainage. .

One of the issues that need to be underscored is the infrastructural vulnerability of Mumbai. Whenever the city receives heavy rains, its roads get waterlogged, and the traffic is disrupted. Though the Municipal Corporation undertakes monsoon preparedness measures, its efforts have not proved to be very effective due to its old drainage system. **Mumbai needs to replace its drainage system, which is more than 100 years. It would require Rs. 1,200 crores to replace the drainage system.** The Government of Maharashtra has already submitted a request for central assistance for replacing its drainage system.

The Government has taken a decision to set up a **State Disaster Management Authority** as envisaged in the bill introduced by the Government of India in the Parliament. The Government proposes to bring a legislation on disaster management to provide statutory support to the Disaster Management Authority and provide greater teeth to the disaster management functionaries.

Central Assistance

The Government of Maharashtra is in the process of preparing the Memorandum for seeking central assistance. In view of extensive damage due to floods, the Government would request for a special dispensation similar to the Tsunami package that was declared for the Tsunami-affected states. The Government of India has already released Rs. 1,000 crores from the National Contingency Calamity Fund for meeting the

immediate requirements of relief and recovery. The Government of India has also sanctioned 15,000 tons of foodgrains through the Special Component of the Sampoorna Grameen Rozgar Yojana (SGRY).

The Government of Maharashtra is committed to the expeditious rehabilitation of the flood-affected people. Further, the Government of Maharashtra would like to look into underlying vulnerability of Mumbai, and seek sustainable solutions in terms of restoration of natural drainage. It also would like to replace the century-old drainage system of the city of Mumbai. It is important that the State Government receives adequate Central Assistance for undertaking these mitigation measures so that such a flood does not affect the city of Mumbai again.