

# Mumbai's Natural Calamity: Rain and Suffering - 2005

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**Abstract:** The heavy rainfall in Mumbai on 26<sup>th</sup> July 2005 had created water logging in and around Mumbai causing disruption of transport, overflowing of water channels on the road; thereby flooded water in all the low lying areas reached the houses, hospitals, shopping complexes, offices, institutes and industries. This had led to disruption of the normal lives of people. The people and animals had also become victims of this disastrous rain. It was reported that many people lost their lives due to flood water and falling of debris in some housing areas. Lots of properties have been damaged due to heavy flooded water in and around Mumbai. The sewage pipes and water pipelines due to heavy force were also damaged in some areas which resulted into faecal contamination in the drinking water causing diseases like leptospirosis, gastroenteritis, dysentery, diarrhea, jaundice, eye conjunctivitis etc. The huge solid waste was also generated due to mixing of garbage, household damaged wastes, biomedical wastes, industrial wastes and market wastes etc. The pathogens from dead animals and human bodies also reached water bodies. This might have created new borne pathogens as a source for water-borne diseases. The water-borne diseases were a problem in Mumbai because of severely contaminated water. The physicochemical characteristics of water were assessed in different areas.

Mumbai's this disaster occurred due to down pouring of rain which has made the authority to make the proper planning for drainage/water pipelines/road construction, housing and shopping complexes and disaster management, in case of emergency, for this cosmopolitan city before the next rainy season begins. The scenario that occurred during the heavy rainfall on 26<sup>th</sup> July 2005 and thereafter for a couple of days has been reported in the present paper.

**Key words:** Rain, calamity, health, garbage.

## Introduction

Mumbai has well established drainage pipelines, drinking water supply system, systematic collection and dumping of solid wastes and well established road and railway transport system and other housing/commercial complexes and establishments. Before every rainy season, the drainage channels are cleaned to avoid surface water logging in the low-lying areas. During the last 100 years there has not been such heavy rainfall problem leading to disturbances and disasters to the Mumbaikars. The heavy rainfall on 26<sup>th</sup> July 2005 has made the life of Mumbaikars miserable by total disturbances in electric

supply, drinking water facilities, contamination of water resources and many new water-borne diseases causing health hazards. The scenario taken place after 26<sup>th</sup> July 2005 in Mumbai highlights the memorable events. The paper highlights the disastrous events that occurred in Mumbai. The data collected shows loss of life, property damages, health diseases and disastrous events. This gives thought provoking for proper planning for natural disaster management.

## Mumbai Scenario after 26<sup>th</sup> July 2005

In the history of Mumbai, it received heavy rainfall on July 26<sup>th</sup> 2005. Never before such natural disaster occurred in Mumbai due to heavy rainfall. Mumbai was

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totally cut off by road/railways for a period of one week from rest of the world. The educational institutes were closed for some days. Red alert was declared by Government of Maharashtra. Mumbai people activities were stopped under the compulsion of flooded stagnant rainwater from July 26<sup>th</sup> to July 28<sup>th</sup> 2005. The rescue operation for dead animals, human bodies, solid wastes and cleaning of drains, sewage pipelines, water pipelines, health care, food supply to victims were continued by the government, NGO's and common people. The solid waste generated was due to mixing of household materials, hospital wastes, industrial wastes, garbage, damaged properties and damaged food grains etc. The pest spraying was done on the solid wastes to prevent pathogens. The solid wastes was collected and removed to dumping grounds of Mumbai. The rescue of dead animals and human bodies was a great problem to the authority of Bombay Municipal Corporation as well as to the government. The help was sought from central government and rest of the country for Mumbai's disaster due to heavy rain. According to sources:

1. 2000 homes were fully destroyed, 50,000 residences and 40,000 commercial establishments were partly damaged and over 30,000 vehicles were seriously damaged.
2. 445 persons lost their lives in the flood and landslides. Nearly 200 died of suspected malaria, dengue and leptospirosis soon after.
3. Ten sewage-pumping stations were severely damaged. Some western suburbs had sewage gushing backward into homes and on roads.
4. 951 roads suffered moderate to severe damage.
5. Electricity lines backed out in the suburbs, landline telephones were drawn – standby batteries drained, gensets out of diesel – and cell phone networks were jammed.
6. Flights, trains, road transport, business, trade, automated teller machines—everything halted abruptly as most of the suburbs went under water.
7. One thousand flights into and out of Mumbai were cancelled that week. The losses on western and central railways totalled Rs. 90 crore.
8. Suburban pipelines ran dry as water-pumping stations pipelines were hit by washed out roads.

### Health Status

The heavy rainfall disrupted basic functions of Bombay Municipal Corporation like cleaning, collection and dumping of garbage and solid wastes. Apart from

collection of wastes and clearing of water logging at various places, many carcasses of animals were also seen at some places. Continuous water logging led to breeding of mosquitos in the next few days which gave way to many diseases like malaria, dengue etc. Eating and drinking contaminated food and water spread water-borne diseases like Hepatitis A. Incubation time for such infections is 3-6 weeks. The hospitalized people were showing fatigue, nausea, vomiting, fever, chills, jaundice, pain in liver and dark urine. Due to water contamination at various places there was a problem of gastroenteritis. The situation arose like a break-out of water-borne diseases, which caused other dreadful diseases like leptospirosis. The rotting animal bodies and garbage led to growth of unidentified bacteria. There was also a spurt of fear about viral fever because of long exposure to dirty rainwater. The researchers started finding the new borne pathogens if any, in contaminated water; but could not succeed to identify such microorganisms. The preventive medicines were taken against leptospirosis by many people. The hospitals in Mumbai were fully occupied by the patients and even some were admitted without beds in many hospitals. Shortage of medical staff was actually felt by the authorities.

The statistical data available in the medical scan is given below:

<i>Diseases</i>	<i>Admissions</i>	<i>Deaths</i>
Fever	6399	111
Malaria	1022	20
Hepatitis	322	3
Dengue	101	3
Gastroenteritis	2371	12
Leptospirosis	679	61
Typhoid	91	0

### Immediate Steps – Directives

Based on the petition filed by the NGO's to prevent the outbreak of epidemic, High Court gave the following directives:

1. Immediately remove carcasses, garbage and stagnant water.
2. Remove debris blocking the drainage system.
3. Ensure adequate supply of medicines to all patients. Provide medical facilities around the clock in affected areas in Mumbai, Thane, Kalyan and other parts of Maharashtra.
4. Make efforts to procure doctors and medical staff from other districts and states if necessary.
5. Take help from willing doctors, nurses and compounders and give their names on website.

6. Set up a team of senior officials to personally supervise the work and distribute medicines in Mumbai, particularly in slums.
7. Set up information centres and send mobile vans to badly affected areas for medical check-up and distribution of medicines.
8. Police Commissioner, the Drug Controller and other officials must ensure that private chemists sell medicines at normal prices and should not utilize the situation to make extra money.

## Causes of Water Logging

### Garbage

Mumbai generates about 7800 tonnes of garbage every day, during heavy rains it was in the range of 10,000 tonnes, which included 150 tonnes of food grain, 30 tonnes of milk powder, 15,000 carcasses of sheep and goats and 1500 bodies of cows and buffaloes.

#### *Garbage Collection System*

Workers: 20,000

Administrative Staff: 50

Dumping grounds: 3

Garbage transfer stations: 3

Compactors: 500

Dumpers: 250

Tempos: 150

Refuse vehicles: 150

Cranes: 80

#### *Garbage collected since 26<sup>th</sup> July 2005*

<i>Day</i>	<i>Garbage (in tonnes)</i>
July 28	8,742
July 29	8,900
July 30	8,960
July 31	11,558
August 1	10,155
August 2	11,646
August 3	9,677
August 4	11,241
August 5	11,899
August 6	8,178
August 7	9,846
August 8	8,796
August 9	10,539
August 10	11,119

### Sewage

#### *Sewage Pipeline Status in Mumbai*

- 1400 km – Sewage pipelines
- 53,000 – Manholes

- 2.65 lakhs – Streets connected sewers serving 65% of the population
- 50 pumping stations handle 3116 million litres of water

Due to flooding in Mumbai, the damaged household materials, food grains, damaged commercial goods, industrial wastes, hospital wastes, sewages, garbage became the solid waste. The collection and dumping of such unique solid wastes was a major problem before Bombay Municipal Corporation authorities. Sewage pumping station at Dahisar and Varsova stopped pumping after being submerged in water. The residents reported that despite flushing their toilets the goop simply refused to go down and everything was just overflowing. Several residents faced the same problem. At some places manhole was letting out human excreta and muck on to the roads due to overflowing of manholes.

Further it was reported that toilets and manholes were overflowing because of the sewage lines getting choked and pumping lines not operating for a couple of days during that period. There was a fear among Mumbaikars that sewage spills will lead to epidemics like cholera, leptospirosis and gastroenteritis. The water treatment system of Mumbai was difficult to cope up with such situation. Contaminated water supply was reported from many areas of Mumbai. The use of hot water for drinking and cooking was recommended during the period. The situation for treatment of water and supply of quality water for consumption came into control slowly.

#### *Plastic Bags*

The use of plastic bags has become very common for the day-to-day modern life. The commercial shop items, goods or vegetable markets provide the plastic bags for carrying the materials. The plastic bags disposal has become a problem. The plastic bags remains as an unwanted material due to its non-biodegradability in the municipal solid wastes. The blockage of drainage pipelines, sewage pipelines as well as normal flow of water is hindered due to the presence of plastic bags. The plastic bags was one of the cause which blocked the normal effluent/water flow system.

Besides 2800 tonnes of garbage produced daily, Mumbai generates 40 tonnes of plastic waste.

The use of plastic bags was immediately banned by the Government. However the NGO's and manufacturing authority of plastic bags raised objection on Ministry of Environment & Forests and for the uplifting of ban on plastic bags. The committee was set up for the critical evaluation of the functioning of BMC and MMRDA and has recommended systematic evaluation of urban hydrology cell and framing common guidelines

especially for the waterways. Chitale committee has submitted the interim report.

The committee set up for the planning of hydrology system in Mumbai highlights the following in the report:

1. Set up urban hydrology authority under a deputy chief engineer.
2. More pumping stations with an increased capacity to drain out at least 50 mm of water per hour.
3. Widening of Mithi from 30 m to 175 m at Kurla.
4. Stop the Airports Authority of India from increasing the ground levels along the Mithi River.
5. Install automatic rain gauges for advance warning.
6. Remove obstructions such as hutments, power cables, water pipes which hinder free flow of stormwater.
7. Physical inspection of desilting of storm water drains.
8. Set up a panel headed by chief secretary to resolve administrative disputes and ensure implementation of the recommendations.

### Conclusion

Mumbai has well planned disaster management system. A disaster could be due to natural or man-made calamities. A proper planning could not be implemented

to the expected extent because of lack of authorities. The lack of training or mock drill to the authorities was also a reason for improper implementation of the disaster management plan. Secondly, never before 26<sup>th</sup> July 2005 Mumbai experienced such natural disaster due to heavy rains. Thirdly, Mumbai authorities and NGO's could not reach to the situation on time for rescue of the people/ animals and loss of properties because of the flood all over Mumbai. Transport both by rail and road including electricity and water supply as well as drainage system came to standstill at least for a week in many parts of Mumbai.

Now, the Maharashtra Government, Central Government and Bombay Municipal Corporation authorities have established an expert committee for disaster management. A proper planning of road/rail/ garbage/solid wastes/drainage/water pipelines including housing and commercial complexes and establishments are on going in Mumbai.

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