KOLKATA
MUNICIPAL
CORPORATION

CITY DISASTER MANAGEMENT PLAN OF KOLKATA

VOLUME-1

CITY DISASTER MANAGEMENT PLAN OF KOLKATA

VOLUME – I

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FOREWORD

Cities are important centres of modern societies that will continue to gain in importance in the future. Today, more than half the world's population lives in urban areas. Of this figure, almost one in eight people lives in a megacity, and almost half live in urban settlements with fewer than 500,000 residents. According to UN estimates, by 2045 the number of residents in cities will increase by one and a half times, to six billion worldwide. Not only people (residents, commuters, and tourists) are concentrated in cities, but also infrastructure, whose importance extends far beyond municipal, and often national borders. These include transport, communication, and energy networks, as well as educational and healthcare facilities. More than 80 per cent of global economic output is generated in cities.

However, the strength of cities as social, technological, and economic hubs also presents disadvantages. The high density and interdependence of urban lifestyles and work, and the growing dependence on increasingly complex infrastructure systems and services, are making cities more vulnerable to a variety of hazards — natural and man-made. These can be the result of technological, natural or social causes.

Ever since its inception, Kolkata as a city, had to face multi-pronged dangers — some arising out its unique geographical location and topography, while others that sprouted out of the city's physical growth. These have seen manifold rise in recent times — with the physical expansion, augmented infrastructure, population escalation, and commercial development of the city — leading to an imminent need for disaster preparedness.

The perception about disaster and its management has undergone a change following the enactment of the Disaster Management Act, 2005. The definition of disaster is now all encompassing that includes not only the events emerging from natural and man-made causes, but even those events which are caused by accident or negligence. There was a long felt need to capture information about all such events occurring across the sectors and efforts made to mitigate them in the city and to collate them at one place in a global perspective. This volume has been an effort towards realising this thought. This book in the present format is the outcome of the in-house compilation and analysis of information relating to disasters and their management gathered from different sources.

It is our sincere hope that this work — the first among the many more that are on the anvil — will give all the stakeholders, a sense of the urgent need to be prepared, not just for the present, but the future as well.

Sovan Chatterjee
Mayor, Kolkata

PREAMBLE

GENERAL INTRODUCTION TO DISASTERS IN INDIA

Before we go into the details, let us have a look into the following definitions.

HAZARD : A potentially damaging physical event, natural phenomenon or human activity that may adversely affect human life, property or cause social and economic disruption or environmental damage.

DISASTER : An extreme disruption of the functioning of community/society that causes wide spread human, material, economic or environmental losses which exceed the ability of the affected community to cope.

VULNERABILITY : The conditions determined by physical, social, economic and environmental factors which increase the damageability or proneness of an individual or community/society to impact of hazards.

RISK : Probability of harmful consequences or expected/anticipated losses from impact of a hazard at a given place over a specific period of time.

CAPACITY : Combination of strength, efficacy and resources available within a community/ organization that can be harnessed to reduce the level of risk or the effect of a disaster – viz. the ability of the stakeholders to cope with/resist/respond to the effects of a hazard or a catastrophic event.

Human vulnerability to disasters is inversely related to human capacity to withstand the effects of disasters. The relationship among them can be expressed as –

$$\text{Disaster Risk} = \frac{\text{Hazard} + \text{Vulnerability} + \text{Exposure}}{\text{Capacity}}$$

DISASTER RISK MANAGEMENT : A systematic process of using administrative decisions, organizations, operationalbcapacities to implement policies, strategies, coping capacities to lessen impacts of hazards – it comprises of prevention (structural and non-structural measures), mitigation (to limit the risk/vulnerability) and preparedness.

DISASTER RISK REDUCTION : A conceptual framework of elements to minimize disaster risks throughout a society to avoid (prevent) or to limit (mitigate and prepare for) adverse impacts of hazards with the aim of integrated sustainable development.

Natural disasters are not bound by political boundaries and affect all – particularly the vulnerable people much more.

The Indian sub-continent is highly prone to natural disasters. Floods, Wind, Cyclones, Droughts, Landslides and Earthquakes are recurrent phenomena. As per the latest damage risk zoning map of Bureau of Indian Standards (BIS) over 60% area of India is prone to earthquake, 8% prone to flood, about 68% area of the country is susceptible to drought and 8000 Km long coastal belt is prone to extensive damage by high wind and cyclone,. Some of the most intense earthquakes have occurred in India and its adjacent areas in the past and she has seen devastating floods and cyclones in last few decades. Human induced disasters caused mainly due to rapid unplanned urbanization and industrialization is comparatively recent experiences in India which have already posed as growing threats for the nation. A total of 31 types of disasters have been identified in this country. The following map (Fig1.1) shows multi hazard areas for different sets of major natural disasters.

Disasters lead to erosion of development gains and restricted options for the affected people. Physical safety - especially that of the vulnerable groups, which include children, old and physically handicapped

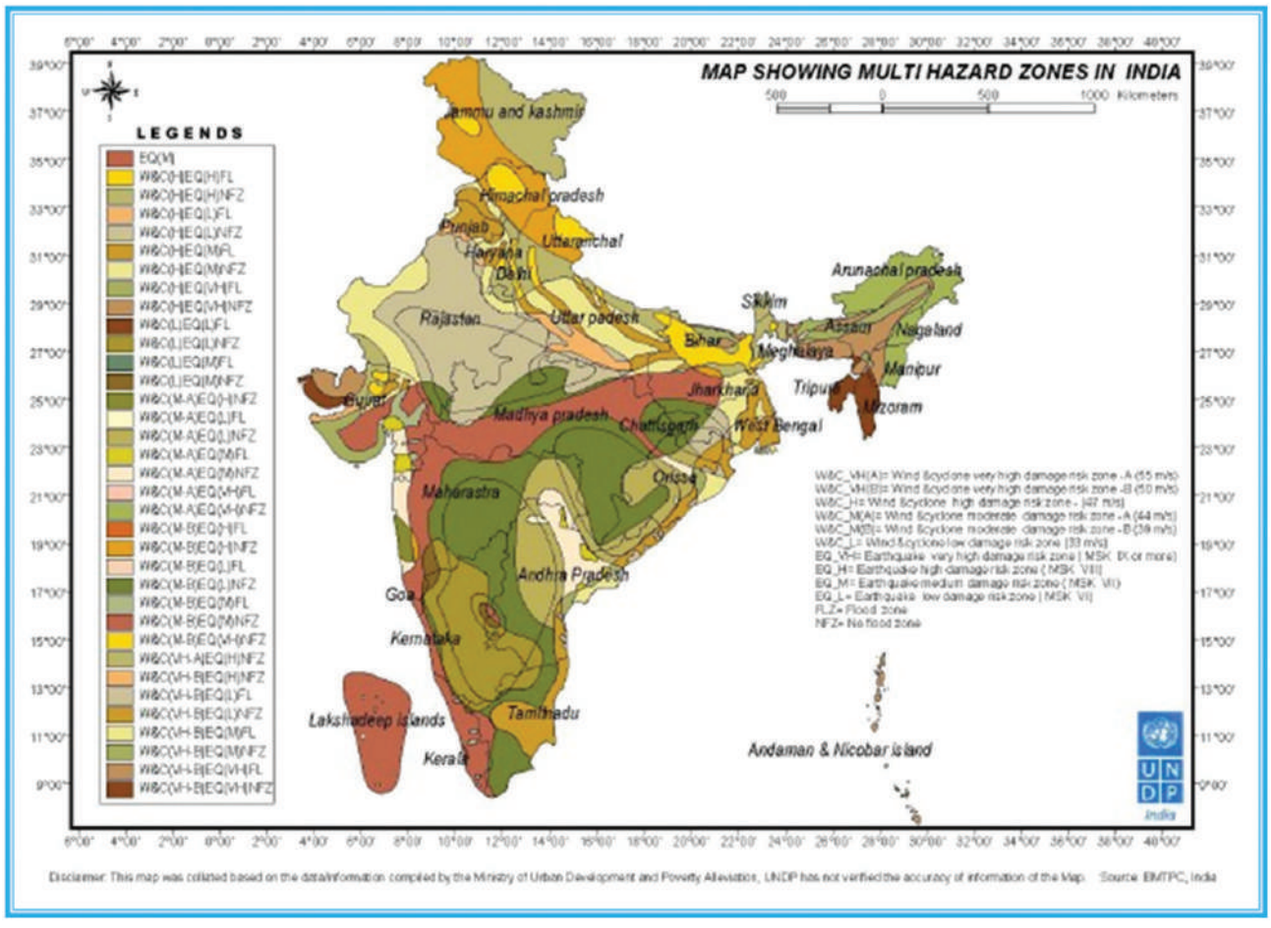

Fig.1 : Multi hazard Zones in India

people, is threatened. Alike similar experiences in other parts of the world, Orissa Super Cyclone of 1999, Gujarat earthquake of 2001, Tsunami of 2004, Kashmir Earthquake of 2005, Uttarakhand Flash Flood 2013 and Nepal Earthquake of 2015 have very clearly illustrated that we need pre- disaster mitigation, preparedness and response systems at all levels so that the threat to human lives and property is minimized.

OBJECTIVES OF PREPARATION OF CITY DISASTER MANAGEMENT PLAN FOR KOLKATA

- To have a document that gives a comprehensive idea about the city of Kolkata in the context of disaster management.
- To have a concise document for all stake holders (Government, KMC, other services providers, NGOs ,CBOs, common people) to know the vulnerabilities and risks of Kolkata city to different major disasters.
- To develop a multi-hazard ready reckoner for all the stake holders containing the roles and responsibilities, contact details and the pre-determined plan of actions (Standard Operating Procedures) for Disaster Management of Kolkata city with intra and inter-organizational well coordinated effort.
- To prepare a document for various stakeholders in disaster management for assessing their needs for training and capacity building.
- To help all in a paradigm shift from relief centric to integrated pre-during-post disaster management approach.

- To help all stakeholders in prioritising and planning their activities (e.g. developing new policies and legislations, organizational/institutional strengthening, undertaking research, developing realistic plans for pre-disaster prevention and mitigation activities, establishing committees and networks, strengthening early warning and information dissemination systems, preparing for response during disaster and post-disaster activities.
- Mainstreaming disaster management into all developmental activities to make them sustainable.
- Mainstreaming gender equity in disaster management and development.
- Initiating public-private partnership in disaster management.

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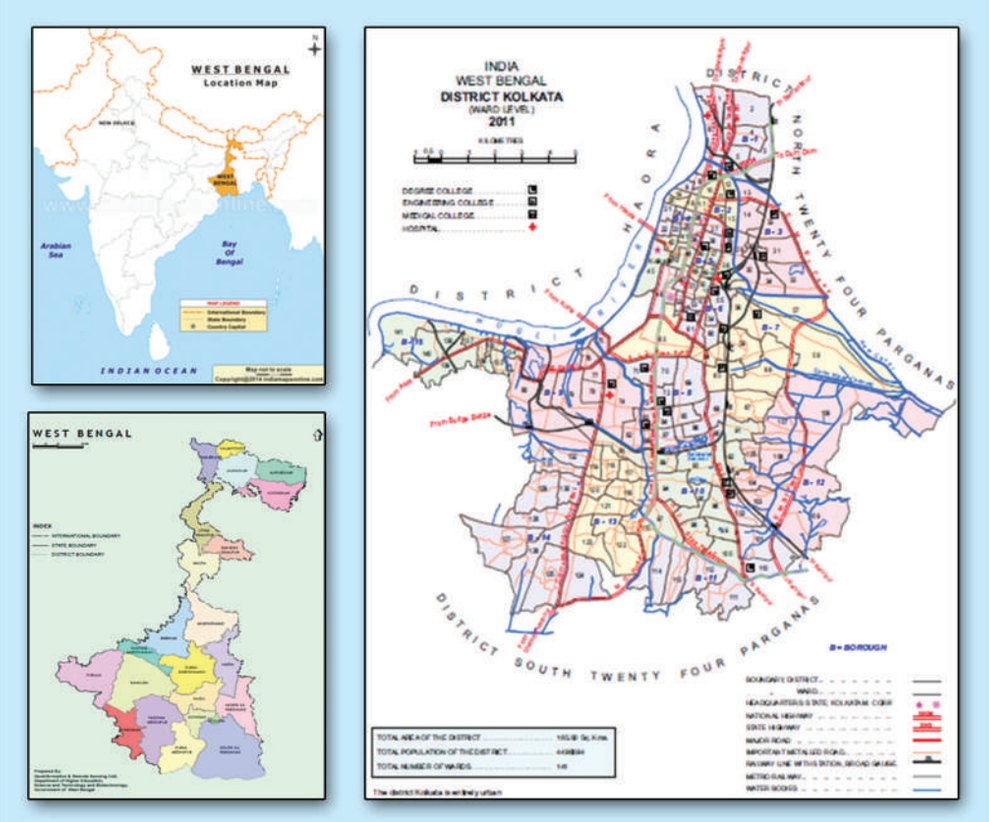
1 Introduction about the City of Kolkata

1.1. Location

Kolkata (formerly known as Calcutta) is the capital of West Bengal, and is one of India's oldest urban areas. Historically, the city was the trading and commercial capital of India and is located on the eastern bank of the river Hoogly, a distributary of the River Ganges. The Kolkata city area is situated between 22°3'N – 22°37'N latitude and 88°18'E – 88°23'E longitude. Calcutta was established and developed as a City from 1690 onwards and was the erstwhile Capital of the British Indian Empire.



Source : ● Geoinformatics & Remote Sensing Cell, Department of Higher Education, Science and Technology and Biotechnology, Government of West Bengal.
● Census of India

Fig1.1 : Location Map of Kolkata Municipal Corporation

The city established as a trading port by the British East India Company. Kolkata, being the capital of the British India, had a prime place in the politics and economy of the country. It caters most of the commercial and financial activities of the eastern region of India. As per the 2011census the city which is managed by the Kolkata Municipal Corporation (KMC) has a population of 4.5 million and covers an area of 200.71 square km (divided into 16 boroughs comprising 144 wards). Kolkata Municipal Corporation (KMC) is the local authority to provide the basic services for the citizens such as supply of drinking water, sewerage, drainage, solid waste management, roads maintenance, street lighting, slum development works etc.

Kolkata is an unplanned city striving with the challenging issues like traffic-transportation, congested roads, presence of large scale informal activities along the major road junctions, growing pressure of population, growth of slums etc.

Table No. 1.1: The growth trend of Kolkata City (Area and Population)

Year	Area (sq. km)	Population (in lakh)	Growth Rate (%)	Remarks
During 1900	83.15			A vast green central park called the Maidan-4.50 sq km (1113 acres)
1901		8.47		Was the second most populated city in Asia and the British Empire Later its area expanded to include many suburban Municipalities
1941		2.16	86	*The demographic profile of the city underwent much change during this unsettling period between 1947 and 1961
1951		26.9	24	
1961		29.2	8.5	* Political turmoil and labour unrest in the late 1960s and early part of 1970s also affected the city causing loss of its economic preponderance
1971		31.4	7.5	
1981	104	32.9	4.4	In 1984, Jadavpur, South Suburban and Garden reach municipalities with more than 800,000 inhabitants in 1981 were amalgamated to Kolkata Corporation.
1991	185	43.9	6.3**	This per centage (6.3%) refers to the decennial growth of population for the area, which is defined as Kolkata Corporation in 1991 census
2001	185	45.7	4.45	Renamed as Kolkata
2011	200.71	44.96	-1.53	In the year 2013 three wards has been added under the area of Kolkata Municipal Corporation.

It has been observed from the statistics given in the above table that the population of Kolkata as on March 1, 2011 was 44.96 lakhs as compared to 45.72 lakhs in 2001. Among all the districts in the state it was Kolkata alone, which recorded negative growth rate.

According to the former director of Indian Institute of Population Sciences in Mumbai Dr TK Roy, one of the major reasons behind this could be the migration of people. While the young generation is migrating to other cities and abroad for employment, some are being pushed to the outskirts due to skyrocketing real estate prices in the city.

Census 2011 showed that Kolkata's total fertility rate (TFR), had plummeted to 1.2 the lowest among all districts in India, which is another reason for decline in population growth rate.

1.2. History

In late 17th Century, an Englishman called Job Charnock stopped at three hamlets of Gobindapur, Sutanuti and Kalikata. Job Charnock did not relish returning to Hooghly where their "factory" had been ransacked by the Nawab's armies. He looked favourably at these villages where local trade already flourished.

In the early years, there was no civic or municipal authority in Calcutta. A Mayor's Court with judicial functions was established in 1726 by a Royal Charter. It undertook some civic work in order to attract dwellers to the city. On 12th August 1765 the East India Company was granted the Diwani of Bengal. This bestowed judicial and revenue-collecting functions upon it, and also implied a moral obligation to provide civic services.

From the middle of the 19th Century attempts and experiments began to be made to establish a Municipal Corporation for Calcutta. It was felt that the city had grown and needed proper and specialised management to deal with its problems. Besides, now the "second city of the Empire" needed to have improved infrastructure, and systems to enable it to solve its own problems. The Calcutta Municipal Corporation Act 1980 came into force on January 1984.It extended the boundaries of Calcutta by including the Municipalities of South Suburban, Garden Reach and Jadavpur within Calcutta. The number of wards of the Corporation was raised from 100 to 141.The provisions relating to Bustees were modified. Further in the year 2013 three wards has been added under the area of Kolkata Municipal Corporation and now it is raised from 141 to 144.

1.3 Area and Division

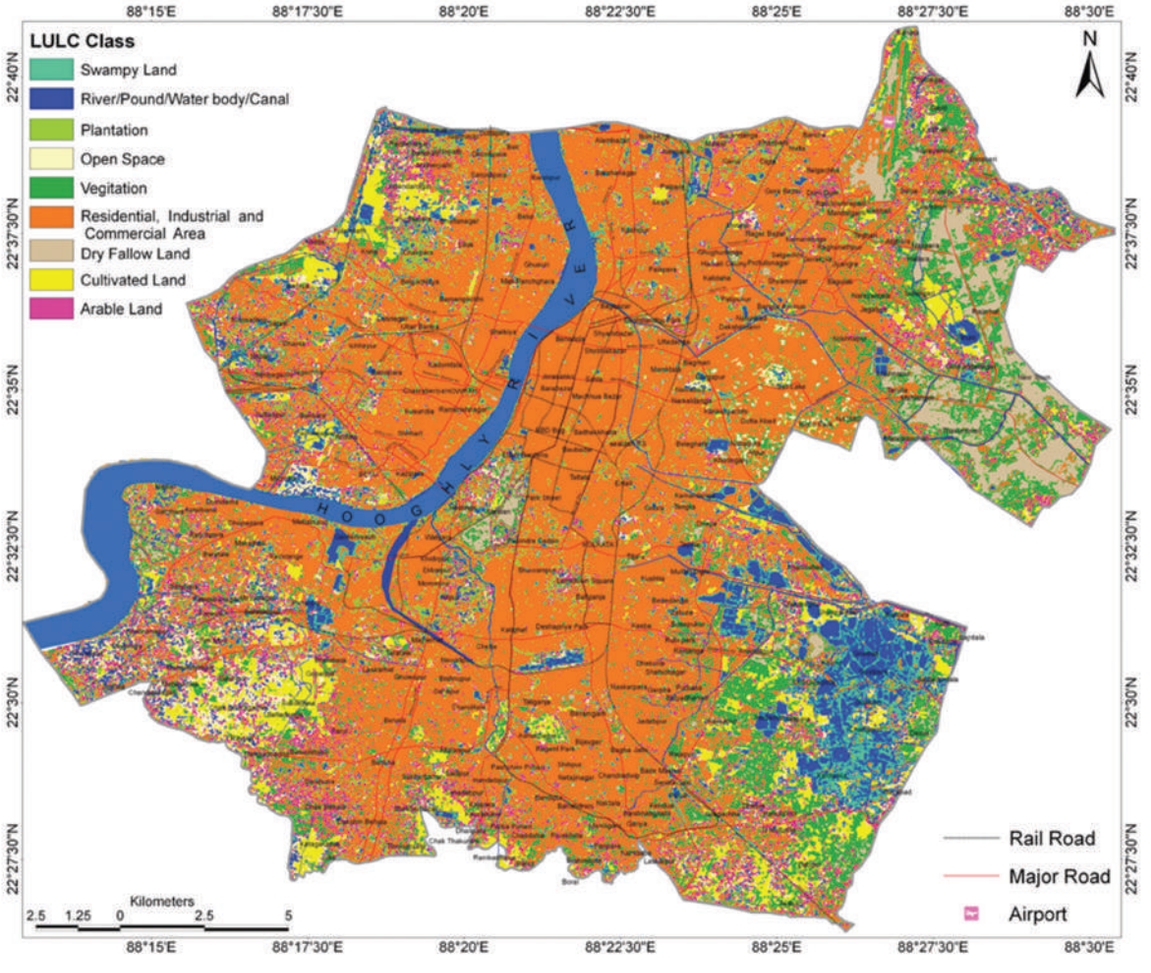
Kolkata is geographically located in the northern hemisphere, between 22º 3' to 22º 37' North Latitude and 88º 18' to 88º 23' East Longitude. is the main port entry in North Eastern India. It is 120 km from the Bay of Bengal and stands on the eastern bank of river Hooghly (Ganga)The city stands on the eastern bank of the river Bhagirathi / Hooghly, a mainstream course of the river Ganga - at an average elevation of 6.40 meters above the Mean Sea Level (MSL). It is located about 145 km away from the confluence with the Bay of Bengal. Hooghly River provides the city Kolkata with a very gentle slope towards east and south east. In the eastern part of the city - large stretches of wetlands and marshy areas with swamps, spreading over an area of about 12,500 hectare – provide a unique ‗urban eco-system' in an environmentally sensitive area.

Since before independence, socio-economical and political reasons caused heavy in migration resulting increase in the city's spread considerably. However Kolkata, except for a small area roughly bounded by A.J.C. Bose Road and A.P.C. Roy Road and the River Hooghly, has rarely experienced planned development. The city experienced by and large an organic growth – giving rise to a mixed land use development pattern, guided by the spontaneous reaction of the local residents and market forces. The city limit has changed a number of times during last three centuries. The latest jurisdictional change in the city's limit was made through enactment of the Kolkata Municipal Corporation Act of 1980, when three adjoining municipalities – Jadavpur, South Suburban, and Garden Reach – were brought within the corporation limit. The area of Corporation increased from 104 sq. km. to 185 sq. km and the number of wards increased from 100 to 141. Further in the year 2013 inclusion of Joka area in the KMC increases the number of ward from 141 to 144.

1.4 Physiography and Land Use

The existing linear form of the city presents a marked contrast to either radial or radio centric forms of spatial development pattern of many riverside metros. Kolkata's development was different due to its peculiar ‗land form 'pattern as much as to its major communication routes - which run predominantly north to south along the river bank. The river Bhagirathee (Ganga), over centuries, has deposited large quantities of alluvial silt along its both banks, forming natural levees of high land suitable for human

habitation on both banks. Here the land slopes away from the river all along the banks and within short distances – i.e. about four to five kilometers away from the river, low-lying areas or swamp begins. Therefore, physical extension of the city towards easterly direction was practically restricted. This peculiar landform characteristics presented great constraint for any compact urban development form around a fixed nucleus and resulted linearly developments. Thus in physical growth pattern of Kolkata the inevitable has happened. As faster increase of population could not be matched with supply of good quality build-able land for human settlement or any systematic provision for extension of basic transportation and infrastructure networks throughout the city, already developed build-able areas slowly got saturated and substantial communities grew up in the low lying suburbs of eastern and south eastern fringes.



Source : Report of Geoscience Division, Ministry of Earth sciences, Government of India on Seismic Hazard, Vulnerability and Risk Microzonation atlas of Kolkata.

Fig. 1.2 : Landuse Map of Kolkata city and surrounding areas

Within the municipal limits of Kolkata, the fastest growth has occurred in relatively less accessible low-lying, poorly drained, un-sewered areas located in Borough VII and XI to XV. The urban growth that took place subsequently, thus, could not follow any desirable relationship with the existing landform pattern of Kolkata. Residential growth, in fact, has been occurring in areas of severe geographical constraints _ where the only lands available for development were mainly those rejected as unsuitable by the earlier generations of Kolkata's residents '. These lands are either predominantly low lying, swampy and immediately flooded by the monsoon rains each year or encroached land of railways, canal banks, even dry canal beds, garbage disposal areas and the like. It is not only very expensive to make these areas suitable to a point when decent urban development can take place, it also became highly difficult and expensive for the Kolkata Municipal Corporation to extend all basic utility and services to these areas. From the map () it can be said that maximum area of the kolkata is residential and commercial, therefore decreasing the infiltration

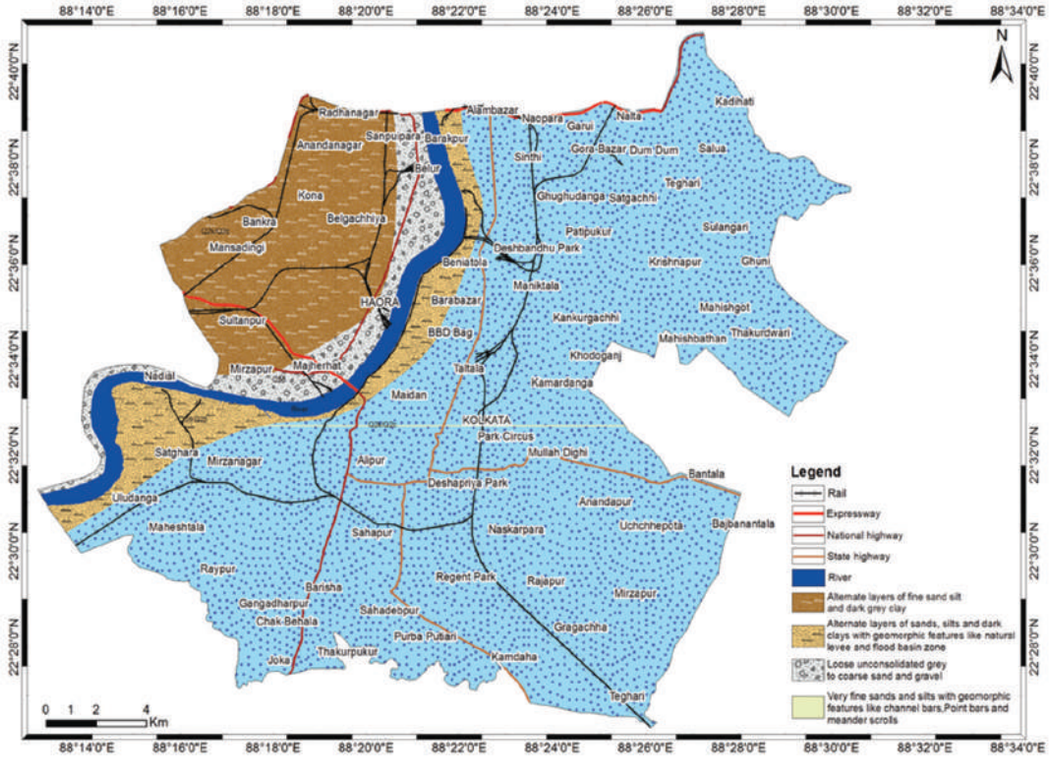
capacity due concrete structure and thus leading to water logging problem in rainy season. Moreover the building sector is the main source of green house gas, which is responsible for increasing city temperature day by day.

1.5 Soil

The soil of Kolkata city is formed with alluvial deposits of the Gangetic Delta and has alternate layers of sand and clay mixed with silt, similar to the soil of Indo-Gangetic plains. Quaternary sediments consisting of clay, silt, various grades of sand and gravel underlie the city. These sediments are sandwiched between two clay beds, the lower one at depths between 250m and 650m and the upper one ranging between 10m and 40m in thickness. The soil is susceptible to failure of foundations due to LIQUIFACTION. Its soil is represented by a huge thickness of unconsolidated younger deltaic deposits of Holocene age. The sediments composed of sand, silt and clay in varying proportions are often associated with angular calcareous concentration (kankar), decomposed organic matters and one or two peat layers. Since there is a close linkage between landform, sediment content and depositional process in deltaic environment – the composition of sediment in different landform units vary considerably. The presence of decomposed vegetative matter, wood pieces and peat layers within the clay silt deposit at shallow depth throughout the area, represents Palaeo-tidal flat environment similar to the present day environment of Sundarban area with mangrove vegetation.

1.6 Geology and Geomorphology

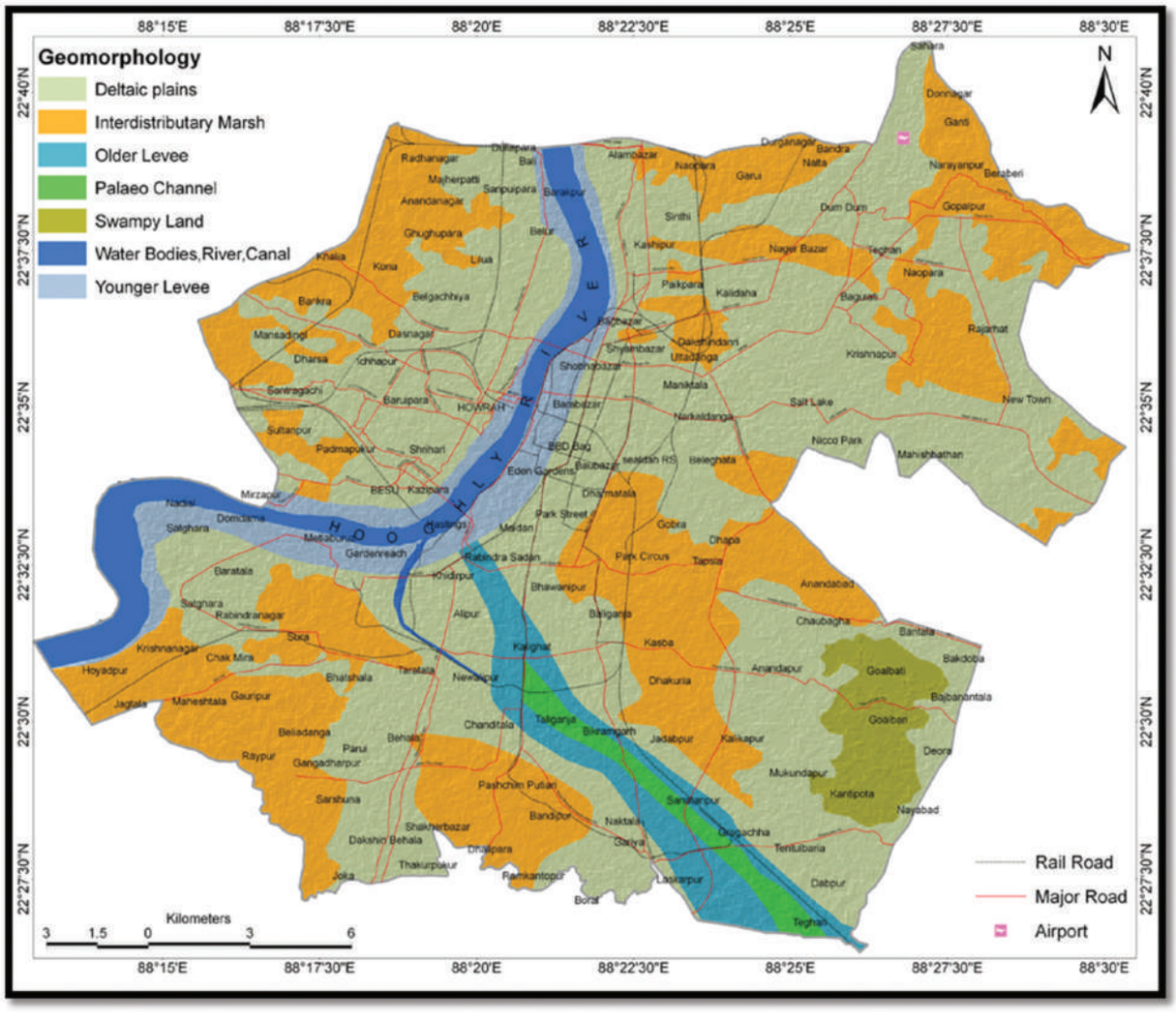
Kolkata is located over a tiny part of the huge pericratonic Bengal Basin with an enormous thickness of fluvio-marine sediments. The sediment thickness and facies are significantly varied from the shelf area in the west and the deep basinal region in the east. The total sedimentary thickness below Kolkata is in the order of 7500 m above crystalline basement, out of which the top 350-450 m is Quaternary sediment followed by 4500-5500 m of Tertiary sediments, 500-700 m of Cretaceous Trap/Trap wash and 600-800 m of Permo-Carboniferous Gondwana rocks (Das and Chattopadhyay, 2009; Nandy, 2007).



Source : Report of Geoscience Division, Ministry of Earth sciences, Government of India on Seismic Hazard, Vulnerability and Risk Microzonation atlas of Kolkata.

Fig.1.3 : Geology map of Kolkata constructed from borehole litholog data and district resource map published by GSI

The geology in and around Kolkata is rather uniform, characterized by the presence of 30-60 m thick grey sticky clay followed by relatively coarser sediments consisting of either silt/fine to medium sand or coarse sand with or without pebbles/cobbles (Chatterjee et al., 1964). The recent geological formations, poorly consolidated/unconsolidated water charged sediments and man-made landfills posed favorable conditions for liquefaction in the City. More than half of the study area, i.e. nearly 330 km2, extending from northeast to southeast of the region is covered with very fine sand and silt in channel bars, point bars as well as meander scrolls. The northwest region of the study area is nearly 57 km2 characterized by unconsolidated sediments, alternate layers of fine sand, silt, and dark clay, which belongs to the Panskura formation or equivalent to the Chinskura formation as shown in Figure 1.4. Alternate bands of sands, silts and dark clays from the Panskura / Chinskura formation equivalent to the Arambag formation are exhibited to the eastern part of the River Hooghly on natural levees and flood zone. Loose unconsolidated grey to coarse sand and gravel from Hooghly formation of the Late Holocene age covered the minimum areal extent in the west of the Hooghly River. The spatial extent of these geological units is represented in Figure 1.4 (*Report of Geo science Division Ministry of Earth Sciences, Government of India*)



Source : Report of Geoscience Division, Ministry of Earth sciences, Government of India on Seismic Hazard, Vulnerability and Risk Microzonation atlas of Kolkata

Fig.1.4 : Geomorphological units of Kolkata

Geomorphologically the city of Kolkata conforms to flat topographic features with an average elevation of 6.4 m above mean sea level sloping mostly southward. The major geomorphic units exposed in Kolkata are broadly classified into six units viz. deltaic plains, interdistributary marshes, paleochannels, younger

levees adjacent to the River Hoogly and older levees on both sides of the old Adi Ganga as shown in Figure 2.24 (Nath et al., 2014; Roy et al., 2012). The major part of the City is covered by the Deltaic plains with 233 km2. Youd and Perkins (1978) classified the geomorphological units with affinity to high, moderate and low susceptibility to liquefaction, with the maximum likelihood in deltas, river channels and uncompacted artificial fills, whereas Ganapathy and Rajawat (2012) asserted abandoned river channel to be "likely" liquefiable. Geomorphologically Kolkata lie under the river channel, flood plain, alluvium fan/ plain and delta/fan-delta depositional environment which indicate moderate to very high susceptibility to liquefaction (Youd and Perkins, 1978).

However, Ambraseys and Bilham (2003a) mapped nearly eighty six liquefaction sites triggered by the near-and-far field earthquakes on depositional environment in the Bengal. Thus, in Kolkata, all the geomorphological units have potential liquefaction susceptibility during strong seismic shaking. [Report of Geoscience Division, Ministry of Earth sciences on Seismic Hazard, Vulnerability and Risk Microzonation atlas of Kolkata prepared by Prof. Sankar kumar Nath]

1.7. Climate

During early summer, dusty squalls followed by spells of thunderstorm and heavy rains lash the city, bringing relief from the humid heat. These thunderstorms are convective in nature, and are locally known as Kal baisakhi. Humidity averages 78%.

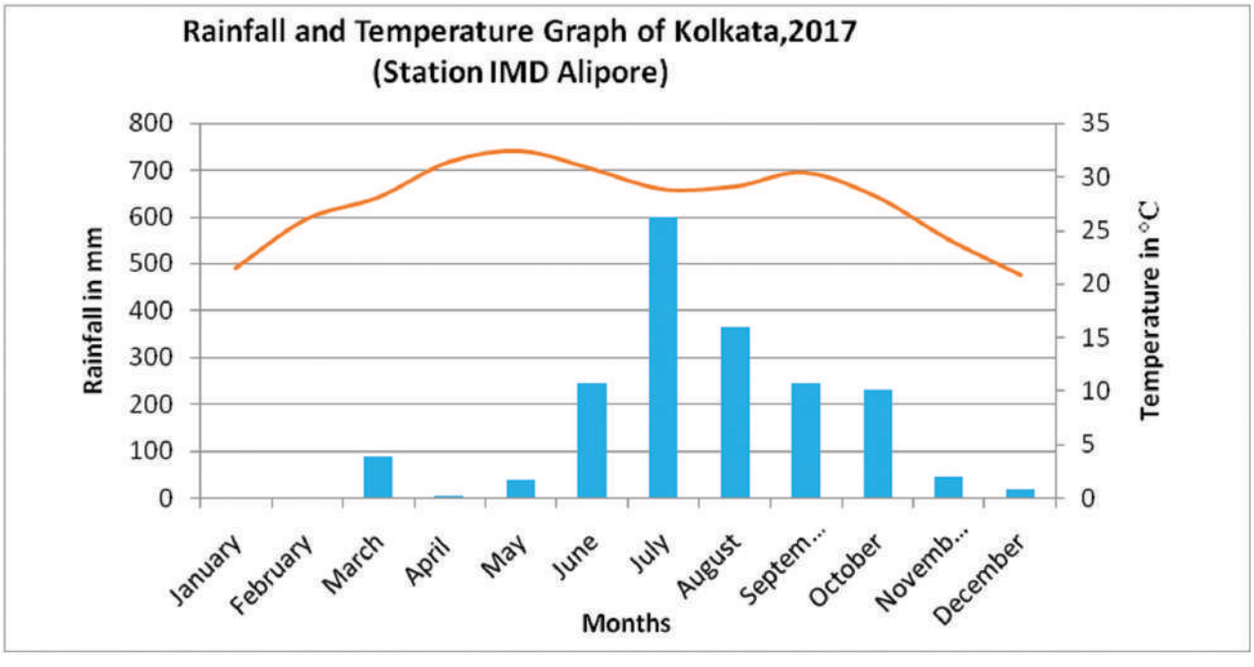


Fig. 1.5 : Rainfall and Temperature Graph of Kolkata, 2017 (Data Source: weatherkolkata.in)

The wetlands surrounding the city in the west and south-west are now mostly filled up by urban expansion. The climate of Kolkata is humid during summer and pleasant in winter. Maximum temperature rises during the summer months of May - June up to 42º C and the minimum temperature falls during winter months of December - January up to 10º on an average. Monsoon stays from June to mid October. The humidity varies from 65% to 85% during the year, it rises in summer and lowers in winter. In 2017 kolkata receives total 1880.73 mm rainfall out of which 89.76 % rainfall occurred in the monsoon months.

1.8. Demographic Features

The population of KMC area is 44, 96, 694 according to 2011 Census. Kolkata is catering a floating population 60, 00, 000 per day. Population density of Kolkata City is 24,429 per sq. km.

Table No. 1.2 : Basic statistics of Kolkata City

Total No of households in Kolkata City	1024928
Total Population	4496694
Total male population	2356766
Total female population	2139928
Male literacy rate	1926915 (53.70%)
Female literacy rate	1661222 (46.30%)

Source : Census of India 2011

Table No. 1.3 : Ward-wise Population by sex and Households in Kolkata (2011)

Ward Number	Number of Households	Total Population	Number of Males	Number of Females
1	11394	53125	27945	25180
2	11305	48190	24381	23809
3	11617	53855	27636	26219
4	8558	34476	17403	17073
5	5815	23707	12243	11464
6	8855	42346	22977	19369
7	4240	19180	9942	9238
8	4285	18760	9498	9262
9	3834	16420	8573	7847
10	5139	27700	14513	13187
11	4715	22152	12086	10066
12	4864	21493	11884	9609
13	7292	33066	17633	15433
14	12387	53343	27064	26279
15	5397	23922	12641	11281
16	4230	20904	10767	10137
17	4895	21023	10824	10199
18	5525	22267	10738	11529
19	4593	21158	11467	9691
20	4310	21576	12180	9396
21	4304	21187	13127	8060
22	2884	15730	9847	5883
23	3338	18256	10901	7355
24	3842	19824	12264	7560
25	5838	27484	14992	12492
26	5659	25371	13692	11679
27	4352	19350	10271	9079
28	7223	38110	20788	17322
29	9047	53782	28942	24840
30	6747	30050	15649	14401
31	8800	39025	20995	18030
32	10708	45636	22931	22705
33	11095	45919	22818	23101
34	7611	29773	14797	14976
35	8524	35024	17481	17543
36	4574	27238	16743	10495
37	4688	24020	14057	9963

Ward Number	Number of Households	Total Population	Number of Males	Number of Females
38	6500	28791	16196	12595
39	3716	21296	12165	9131
40	4733	20549	11771	8778
41	3425	19946	11540	8406
42	3749	21746	15827	5919
43	2878	17677	10899	6778
44	5043	29600	17727	11873
45	1704	8394	5823	2571
46	2316	12823	7684	5139
47	3271	14684	8427	6257
48	4671	20437	11128	9309
49	3965	19416	13511	5905
50	3791	17251	9087	8164
51	3273	13556	7164	6392
52	3304	16869	10205	6664
53	5405	25598	13862	11736
54	6666	36235	18937	17298
55	6745	32254	17450	14804
56	8941	43622	23018	20604
57	11051	49856	26142	23714
58	20093	88465	46207	42258
59	15157	70261	36341	33920
60	6755	35732	18964	16768
61	5447	29704	15954	13750
62	6400	34832	18736	16096
63	4674	24387	14292	10095
64	6342	31280	16652	14628
65	14092	72427	38317	34110
66	20797	98024	51138	46886
67	13631	56284	28910	27374
68	4812	20724	10434	10290
69	9615	44111	22906	21205
70	3879	18618	9750	8868
71	6266	29922	15550	14372
72	4306	19167	10160	9007
73	5260	23512	12541	10971
74	9189	42176	24148	18028
75	5978	26925	15370	11555
76	5052	21946	11507	10439
77	8829	45984	24156	21828
78	10637	54090	28435	25655
79	9235	44303	24125	20178
80	7124	31094	17364	13730
81	10211	41501	21131	20370
82	9994	38838	19782	19056
83	5176	22163	11113	11050
84	4420	19230	9783	9447

Ward Number	Number of Households	Total Population	Number of Males	Number of Females
85	6402	29566	15059	14507
86	4921	19195	9724	9471
87	3227	12675	6285	6390
88	6109	23672	11996	11676
89	5819	22304	11395	10909
90	4761	18857	9255	9602
91	9995	38450	18967	19483
92	10177	36450	17865	18585
93	11871	44364	22176	22188
94	7121	27469	13918	13551
95	7651	26737	13212	13525
96	8893	31033	15357	15676
97	10222	37199	18613	18586
98	8904	31708	15406	16302
99	7222	26739	13305	13434
100	7269	25507	12386	13121
101	10934	40208	19831	20377
102	5867	21503	10624	10879
103	7105	25428	12499	12929
104	9224	33185	16385	16800
105	5639	21267	10609	10658
106	10558	40618	20466	20152
107	13518	54260	27977	26283
108	15854	64777	33428	31349
109	16238	64567	32460	32107
110	7628	27470	13681	13789
111	10156	38647	19656	18991
112	8373	32404	16309	16095
113	8508	33475	16721	16754
114	10958	41913	21093	20820
115	8461	31919	16001	15918
116	6897	28338	14495	13843
117	5226	21824	11121	10703
118	5433	21810	10897	10913
119	4081	16491	8319	8172
120	5249	19710	9662	10048
121	7712	29921	14919	15002
122	9977	39198	19906	19292
123	9425	35386	17727	17659
124	10128	39179	19352	19827
125	11297	44850	22611	22239
126	8247	31631	15756	15875
127	11221	43782	21920	21862
128	8405	32179	16041	16138
129	10206	39654	19797	19857
130	6150	23227	11327	11900
131	8284	30911	15480	15431

Ward Number	Number of Households	Total Population	Number of Males	Number of Females
132	6722	26274	13320	12954
133	5306	25588	13294	12294
134	6281	35780	18730	17050
135	5911	33258	17553	15705
136	4485	21482	11022	10460
137	3373	19385	10507	8878
138	4629	28858	15581	13277
139	6937	42014	22225	19789
140	5004	30504	16074	14430
141	7755	41152	21452	19700

Source : Census of India 2011

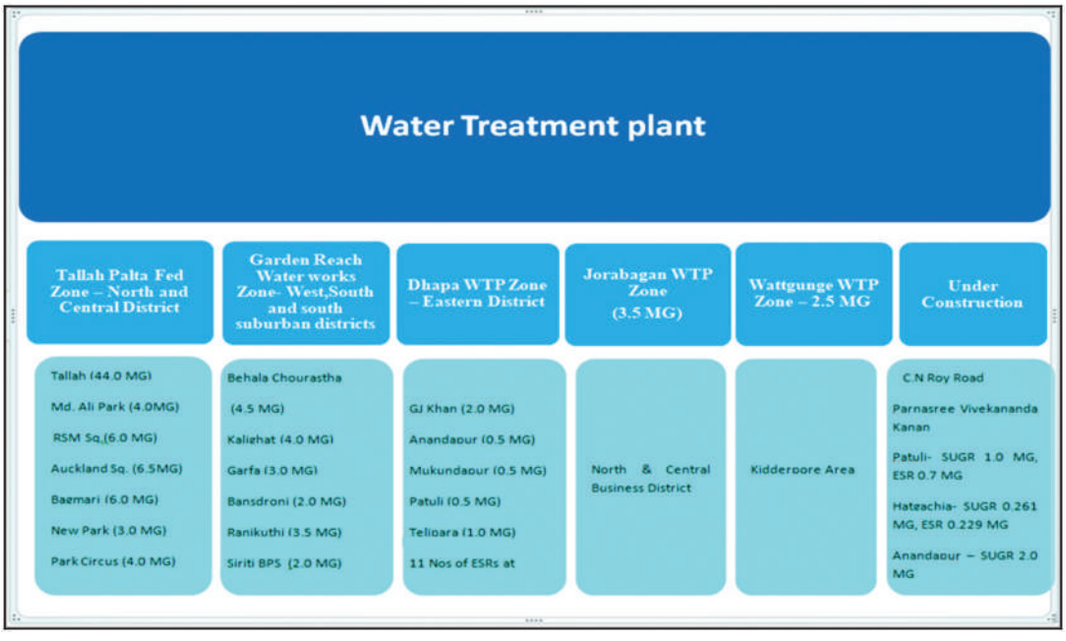
1.9 Water Supply, Sanitation and Drainage

Kolkata water supply system is one of the oldest in the country. It is also one of the few cities with perennial source of surface water with the river Hooghly flowing along. However, the use of river water for kolkata population came much later than the city was formed more than three hundred years ago. During the early years of eighteenth century primary source of drinking water in Kolkata was several tanks of which the most important was Lal Dighi' at present B.B.D. Bag area. With the increase in demand a pump was installed at Chandpal Ghat in 1820 to lift water from river Hooghly for distribution to the white population and their close associates. This untreated water was allowed to flow through a brick channel for the purposes other than drinking.

Table No. 1.4 : Water Treatment Plants and Tube wells with Capacities in Kolkata City

Location of the Treatment Plant	Capacity when built	Present Capacity after augmentation
Palta Treatment Plant (constructed in the year 1865)	6 MGD	260 MGD (* Out of the total treated water 20 MGD is supplied to Salt Lake Municipal area)
Garden Reach Treatment Plant (constructed in the year 1982)	60 MGD	The WTP was initially run and managed by KMUNSA. This plant is basically a trans- municipal project to cater the need of water supply for southern part and added area of Kolkata, Bajbaj, Maheshtala and Pujali. In recent past (2009) K.M.C took over the management of this plant and another 50 MGD unit of WTP has built up, now the total capacity of this plant is 185 MGD, out of which the plant is delivering 154 MGD to its command area.
Watgaunge Treatment Plant	5 MGD	
Jorabagan Treatment Plant	8 MGD	
Dhapa Treatment Plant	30 MGD	Presently the plant is delivering 24 MGB to its command area
Others sources- Ground water	20 MGD	
340 nos. large diameter tube wells		
11000 nos. small dia. tube wells		

Source : Water Supply Department, KMC, 2017



Per day average 8 hours of water supply is catered by KMC and 94% households are covered by surface water.

Table No. 1.5 : Brief History of Water Supply Crisis in last 15 years

Sl. No.	Date / Month/ Year of incidence	Location & Nature of Incidence	Implication
1	October, 2004	Outburst on 45 inch dia. Zone –III Distribution Main	City supply was disrupted for nearly whole day. Restoration was done overnight.
2		Outburst of 24 inch dia. GRP Pipe near Chitpur Railway Yard	Major part of the city supply was disrupted for a day long.Restoration was done on next day morning
3		Outburst of 21 inch dia. Kumartulli Trunk Main at Lock Gate Road because of interference of pile driving over the main during construction of Lock Gate Fly Over.	Water Supply at Cossipore area as well as part of North Kolkata was disrupted.
4	17th March, 2005	Outburst of 60 inch dia. M.S. Zone – IV Distribution Main at Mullick Bazar.	Auckland BPS filling was disrupted & thereby part of Central and Southern division of the city supply was suspended for nearly two days.
5	18th April, 2006 (Mid Night)	Forced incidence of leakage at 1000 mm dia. HDPE Pipe line near Jadavpore University by Airtel TelecomduringoneHDD operation for laying OFC.	Disruption in supply within Garfa UGR command Zone.
6	13th September, 2006	Outburst of 60 inch dia. Dedicated Palta – Tallah Trans Main near ISI, Bon Hooghly.	City was completely wiped & dry for nearly 36 hours.

Sl. No.	Date / Month/ Year of incidence	Location & Nature of Incidence	Implication
7	2005	Sudden collapse of 60 inch. dia. Bypass Trunk Main at Manmotha Ganguly Road near Tallah Bridge.	City Supply was suspended for nearly a day long.
8	2nd March, 2003 (Mid Night)	Outburst of 60 inch dia. M.S. Distribution Main near Beck Bagan.	Supply collapsed for nearly two days in the Southern part of the city.

Source : Water Supply Department, KMC

1.10 Slums

Slums are one of the very common features of cities whether it is metro or small town. Over the years the issues related to slum has challenging the government authorities as well as the organisations working on Poverty and human rights. In 1947after partition Kolkata City faces

huge influx of population which contributed a lot towards the growth of several slums and refugee colonies in the city. Over the years growth of population due to natural causes and migration from the nearby towns and States has led the situation out of control. However inaccessibility to housing schemes, basic services and increasing demand of the real estate has marginalised the poor people one step further and creating a separate city within a bigger city. In 1981, 3.2 milliomn (35%) out of 9.16 million residents were classified as slum dwellers (Ref: Status of Kolkata megacity disaster management system in view of recent natural disasters).

1.10.1. Age and Location of Slums

The slums of Kolkata can be divided into groups, the older slums located in the heart of the city, some as old as 150 years, and the more recent slums mostly located in the outskirts of the city. Most of the slums are located in residential areas within the city. Few slums exist on the western side of the bypass while there are slums on the eastern and north-western side of the bypass which are located on raised land that was previously low-lying wetlands (Bheri region). This area is still surrounded by vast water bodies into which sewage flows from the city. The remaining land is utilised for vegetable and flower cultivation, while fish cultivation occurs in the water bodies. Many slums developed along the canals (Jagarani, Netainagar, Sri-Haripally) and wetlands (Chit Kalikapur). Along with these many slums have come up around the garbage dump in Dhapa. KMC has focused its efforts to provide the basic amenities like housing, water supply, sanitation and electricity in authorised slum colonies. The slum population is extremely vulnerable towards any kind of disaster such as floods, health hazards, fires and cyclones.

1.10.2 Population of Slums

According to Census 2011, the city‘s slum population is 14.09 lakh which accounts for 31.35 percent of the total population of the city. Another survey conducted by the KMC in 2009 reports that 15.70 lakhs slum people live in 1460 slum pockets in 141 wards in KMC.. According to the Survey report of KMC the total slum area is 25.95 Sq.Km. The KEIP Slum Master Plan indicates that 1.92 million (42% of 4.58 million population) population in KMC is estimated to live in slums/bustees and other low income settlement zones and pockets.

The slums residents are the most vulnerable group of urban area because they are low income group and the place where they live.

Table No. 1.6 : Borough wise list of slum dwellers, area and number of bastee pockets in KMC area in 2009

Borough No.	No of Bustee Pockets	Area(sq. m.)	Families	Male	Female	Children	Total Dwellers
I	104	572643.62	15802	35564	31459	11837	78860
II	77	338226.39	10638	28273	22935	6004	57212
III	98	2507917.7	34196	63018	61705	31524	156247
IV	82	507996.25	15038	37072	25733	19234	82039
V	66	364786.15	8130	20419	16285	8165	44869
VI	100	851650.45	18760	37511	33130	37563	108204
VII	172	4303279.4	57470	112889	103385	70199	286473
VIII	168	445217.6	15409	29803	25601	15544	70948
IX	118	1408743.2	29661	55476	52921	23380	131777
X	84	815825.57	14598	30932	29402	12080	72414
XI	53	2284114.5	13257	24710	22154	13553	60417
XII	84	4356017.2	24577	45250	40681	24231	110162
XIII	80	1160520.4	10140	7794	7330	5258	49342
XIV	83	2525613	15743	18979	18546	10592	68982
XV	91	3510804.5	34348	55819	52762	41722	192369
TOTAL	**1460**	**25953356**	**317767**	**603509**	**544029**	**330886**	**1570315**

Source : Slum Department,KMC (2009)

1.11 Transport and communication

Kolkata is well-connected to the rest of India by extensive railway network of the Indian railways. Two divisions of the Indian railways - the Eastern Railway and the South Eastern Railway are headquartered in the city. The two major railway stations of the city are at Howrah and Sealdah. A third terminal called Kolkata has recently been constructed. This station is in North Kolkata and can be reached by a road opposite to the RG Kar Medical College just beyond Shyambazar. The electrified suburban rail network of the ER and the SER is extensive and stretches far into the neighbouring districts of North 24 Parganas, South 24 Parganas, Nadia, Howrah, Hooghly Medinipur etc. The Circular Railway encircles the western part of the city of Kolkata.

1.11.1 Surface transport

Kolkata was the first city in South Asia to have an underground railway system that started operating from 1984. It is considered to have the status of a zonal railway but is not a zone. The Metro is a very well maintained and clean system that itself has become a tourist attraction. The line begins at Dum Dum in the north and continues south through Park Street, Esplanade in the heart of the city till the southern end in Tollygunge. At present, the line is extended southward up to Garia, and in north upto Noapara. This new portion of the Metro is on surface.

Table No. 1.7: Registered Number of Motor Vehicles on Road in Kolkata

Year	Goods Vehicle	Motor Car & Jeep	Motor Cycle & Scooter	Taxi/ CC	Auto Rickshaw	Mini Bus	Bus	Trailer/ Tractor	Others	Total
2011-12	1461	27883	20517	975	621	11	56	0	66	51590
2012-13	2935	28180	26272	2859	263	26	142	10	92	60779
2013-14	2239	23688	25018	3008	414	48	208	4	73	54700
2014-15	1410	27293	28886	3711	259	840	31	32	108	62570
2015-16	1060	26166	30728	7705	319	59	350	2	133	66522
2016-17	836	20158	23168	3112	51	149	8	0	116	47598
As on 31.03.2017	**23714**	**347546**	**336676**	**52210**	**20735**	**1696**	**4481**	**94**	**1325**	**788477**

Source : Transport Department, Govt of West Bengal

1.11.1.1 Buses and Taxi

Kolkata also has an extensive network of government run and privately owned buses. The private-owned buses are quite typical of kolkata and are usually very crowded. The private-owned buses are of two types, the regular ones and the mini-buses. The regular buses are coloured light-blue and yellow. The government-run buses are run by several authorities like Calcutta State Transport Corporation (CSTC), South Bengal State Transport Corporation (SBSTC) West Bengal Surface Transport Corporation (WBSTC) and the Calcutta Tramways Company (CTC). Recently Aeron buses have been introduced by the WB Surface transport Corporation.

The metered cabs are mostly of the brand "Ambassador" manufactured by Hindustan Motors.

Recently, privately owned air-conditioned cabs (like Ola and Uber) have been introduced. There is a government plan called Gatidhara , where Government provide loan to people to buy cab . The all-yellow ones have a Bengal permit. A network of expressways like Kona Expressway, Belghoria Expressway, widening of southern stretch of Eastern Metropolitan Bypass and construction of the Nivedita Setu has eased the traffic congestion. Several Flyovers like Ma, ultodanga etc also minimised the traffic congestion in the Park Circus area.

1.11.1.2 Tram

Kolkata is the only city in India to have a tram network. Trams are under the administration of CTC, a government of West Bengal Undertaking. The environment friendliness and the old charm of the trams attract many people. The tram lines laid in some major roads are being renovated to maintain the tram lines on the same level plane as the rest of the road, thereby smoothening the road. With the tracks now running in the centre of the heavy traffic roads, commuters are encountering difficulties in getting to the trams' stops through the traffic and as a result, less number of people are able to use the tram easily.

Table No. 1.8: Fleet strength and Number of Depots of CSTC, CTC and WBSTC

State Transport Undertakings (S.T.Us)			
Fleet Strength			
Financial Year	**CSTC**	**CTC**	**WBSTC**
2010-2011	956	401	142
2011-2012	839	380	172
2012-2013	779	380	188
2013-2014	718	380	188

State Transport Undertakings (S.T.Us)			
Fleet Strength			
2014-2015	782	380	225
2015-2016	813	401	232
	WBTC		
2016-2017	750	501	252
2017-18 (Upto October)	786	540	239
Number of Depot:			
	WBTC		
	CSTC	**CTC**	**WBSTC**
Upto October, 2017	11	11	3

Source : Transport Department, Govt. of West Bengal

1.11.2 Water Surface Transport

Kolkata is also a major port and together with the Haldia dock systems, the Kolkata Port Trust has been amongst top performers in the country. Kolkata Port has regular passenger services to Port Blair from the Netaji Subhas Docks. It is the oldest operating port in India, having originally been constructed by the British East India Company in the 19th century. After independence its importance decreased because of factors including the Partition of Bengal (1947), reduction in size of the port hinterland and economic stagnation in eastern India. In the 21st century due to the East Indian economic recovery and infrastructure improvements, the port grew swiftly to become the nation's second largest container port. It was one of India's fastest growing ports in 2004-05.

Howrah Bridge (Rabindra setu) and Vidyasagar Setu are two suspended bridges connecting Kolkata with Howrah over the Ganga river. Vivekananda Setu is the third bridge over the river. The fourth one (Nivedita Setu) has been constructed near Vivekananda Setu. The twin cities of Kolkata and Howrah are connected by local water ferries through the extensive river ghats like Fairlie Ghat, Howrah Ghat, Shibpur Ghat, Prinsep Ghat, Cossipore Ghat, etc Small boats are used for recreational purpose.

Following the shift of power from the company to the British crown, a port commission was set up in 1870. Though the port was conceived to be a commercial port and gateway of eastern India, the port played a very important role in the Second World War. It was bombed twice by the Japanese forces. After the independence, the Commissioners for the Port of Kolkata was in responsibility of the port till January 1975 when Major Port Trusts Act, 1963, came into force.

1.11.3 Air transport

The Netaji Subhash Chandra Bose International Airport at Dum Dum (previously known as Dum Dum airport, 18 Kms from the City) is the only airport in the city, operating both domestic and international flights. Recently 2nd terminal has been constructed in this airport.

The city of Kolkata has a small second airport at Behala. Presently the airport is used for helicopter services to other parts of West Bengal. The Government is supporting various options including private investment to develop this as a second airport of the city, especially given the location of the airport in the southern part of Kolkata, and at a distance of nearly 30 kms from the existing airport, located in northern Kolkata. The airport is also linked by the suburban railway system.

2 Vulnerability to Disasters and Risk Assessment of Kolkata City

The populous City of Kolkata is situated in the multi-hazard prone southern part of the state of West Bengal which has considerable risk of damage/loss of lives and property due to natural hazards like Cyclone, Earthquake and Flood even if we keep aside the threats due to human induced hazards as Fire, Accidents, Industrial & Chemical hazards etc. To minimize the losses due to disasters and to have a disaster resilient society, we must have clear understanding in regard to the type and strength of each of the probable threats which may cause disasters of medium or large scale in the city.

As per National Disaster Management Act of 2005:-

Hazards are basically of two types:

- **Natural Hazards** → Hazards with meteorological, geological or biological origin.
- **Unnatural Hazards** → Hazards with human caused or technological origin.

■ **Disaster** is a catastrophe, mishap, calamity or grave occurrence in any area, arising from natural or man-made causes, or by accident or negligence which results in substantial loss of life or human suffering or damage to, and destruction of, property, or damage to, or degradation of, environment, and is of such a nature or magnitude as to be beyond the coping capacity of the community of the affected area.

■ **Vulnerability** is the extent to which a community, structure, service or a geographic area is likely to be damaged or disrupted by the impact of particular hazard, on account of their nature, construction and proximity to hazardous terrain or a disaster prone area. Vulnerabilities are also mainly of two types:

Physical vulnerability → Weak Buildings, Structures, infrastructure or living being which are incapable to any extent of resisting themselves becoming prey to disaster(s).

Social and Economic Vulnerability → Human being incapable to any extent of resisting themselves falling prey to disasters. Economic vulnerability relates to economic losses to any extent caused by disaster(s).

■ **Capacity building includes:**

i) Identification of existing resources and resources to be acquired or created.

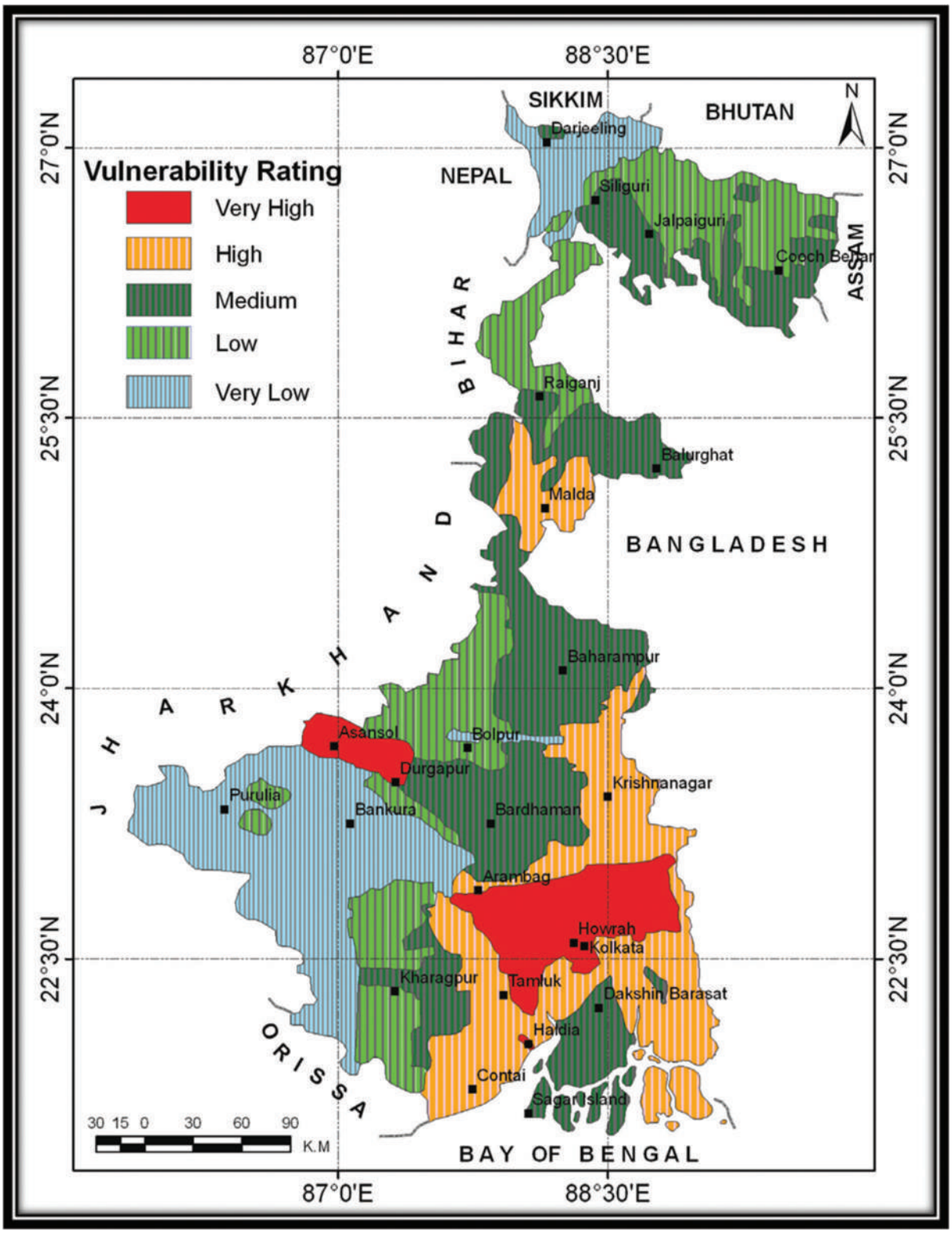
ii) Acquiring or creating resources identified under (i) above.

iii) Organization and training of personnel and

iv) Coordinated application of such training for effective management of disasters.

■ **Risk** is a measure of expected injury or loss of life or expected damage to property or economic activity due to a hazard of a particular magnitude occurring in a given area over a specific period of time.

From the map (Fig.2.1) it can be said that the vulnerability to different types of hazard is very high in Kolkata because of its huge population and exposure to hazards like water logging, earthquake, cyclone, fire, building collapse and other social or technological hazard.



Source : Report of Geoscience Division, Ministry of Earth sciences, Government of India on Seismic Hazard, Vulnerability and Risk Microzonation atlas of Kolkata.

Fig. 2.1 : A composite vulnerability macro-zone map of West Bengal computed from integration of hazard distributions - earthquake, flood, wind and cyclone, landslide, and subsidence along with vulnerability components represented by district-wise population density, and Industrial output distribution (after Nath *et al.*, 2008a)

2.1 WIND AND CYCLONE

About 120 million people all over the world are exposed to tropical cyclone hazards on average every year. High relative vulnerability has been found in Bangladesh which has experienced very strong wind coupled with very heavy rainfall many times in the past few decades. The coastal part of India with substantial populations and high percentage of arable lands are also highly vulnerable.

Tropical Cyclones are classified into three main groups based on intensity :

A **Tropical Depression** is an organized system of clouds and thunderstorms with a defined, closed surface circulation and maximum sustained winds of less than 17 metres per second (33 kn) or 39 miles per hour (63 km/h). It has no eye and does not typically have the organization or the spiral shape of more powerful storms.

A **Tropical Storm** is an organized system of strong thunderstorms with a defined surface circulation and maximum sustained winds between 17 metres per second (33 kn) (39 miles per hour (63 km/h)) and 32 metres per second (62 kn) (73 miles per hour (117 km/h)). At this point, the distinctive cyclonic shape starts to develop, although an eye is not usually present. *The name of the third group of more intense storms depends on the region.* ***In the Southern Hemisphere or the Indian Ocean storms of tropical nature are referred to as*** **"Cyclones"**. A tropical cyclone with sustained winds of at least 33 metres per second (64 kn) or 74 miles per hour (119 km/h) tends to develop an *eye* — an area of relative calm (and lowest atmospheric pressure) at the center of circulation. The eye is often visible in satellite images as a small, circular, cloud-free spot. Surrounding the eye is the *eyewall*, an area about 16 km (9.9 mi) to 80 km (50 mi) wide in which the strongest thunderstorms and winds circulate around. Maximum sustained winds in the strongest tropical cyclones have been estimated at about 85 metres per second (165 kn) or 195 miles per hour (314 km/h).

If a tropical storm in the *Northwestern Pacific* reaches very high winds on the Beaufort scale, it is referred to as a **Typhoon**; if a tropical storm passes the same benchmark in the Northeast Pacific Basin, or in the Atlantic, it is called **Hurricane**.

(Source : http://en.wikipedia.org/wiki/Tropical_cyclone).

The criteria followed by the India Meteorological Department (IMD) to classify the low pressure systems in the Bay of Bengal and in the Arabian Sea as adopted from the World Meteorological Organization (W.M.O.) classification are as given in the following table.

Table No. 2.1 : Strength of Tropical Cyclones classified according IMD

Category	Wind Speed (Km/hr.)
Low Pressure Area	< 31
Depression	31 to 49
Deep Depression	50 to 61
Cyclonic Storm	62 to 88
Severe Cyclonic Storm	88 to 118
Very Severe Cyclonic Storm	119 to 221
Super Cyclonic Storm	≥ 222

Source : IIT Kgp Report

2.1.1 Vulnerability of Kolkata city to Wind and Cyclone

The Bay of Bengal is potentially energetic for the development of cyclonic storms and accounts for about 7% of the global annual total number of storms (Gray, 1968).

The following **Vulnerability Map** (Fig, 2.2) of West Bengal due to Wind and Cyclone (published by BMTPC, Govt. of India) reveals that Kolkata City along with its surrounding districts fall in Very High Damage Risk zone due to Wind and cyclone and can be hit by basic wind speed (Vb 50 metre per second i.e. 180 kmph). The well known cyclonic storm SIDR which hit Bangladesh just passing by the Sagar Island of West Bengal on 15th November, 2007 was a sample of this threat. The Cyclone AILA , caused huge damage to the North 24 Pargans, South 24-Parganas, Purba Midnapur and Kolkata. Death tolled to 146. So, Kolkata may have to face super cyclone in the days to come like Orissa experienced in 1999.

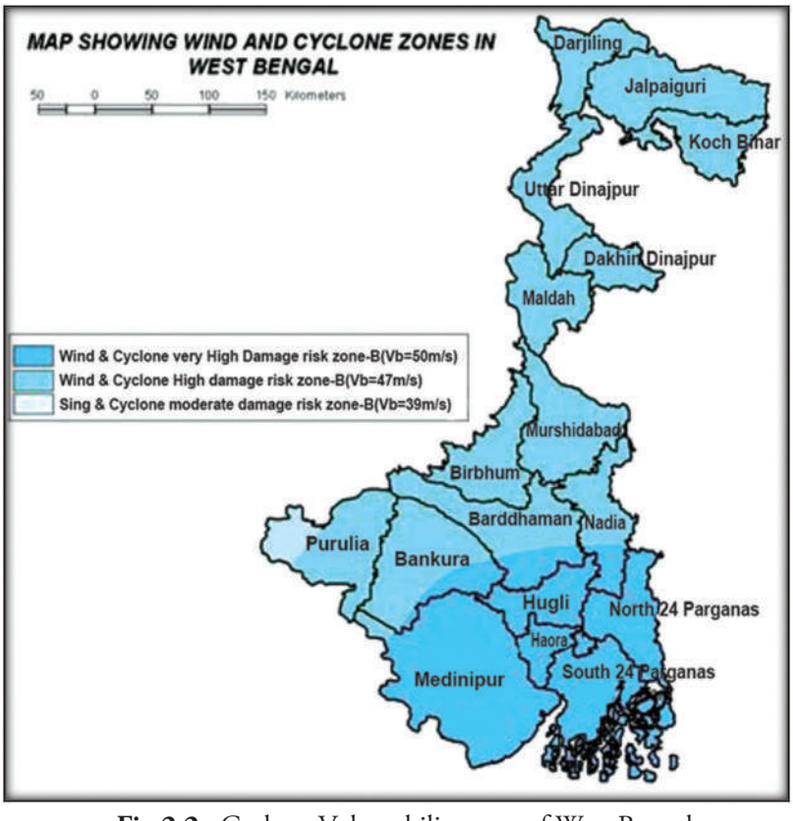


Fig.2.2 : Cyclone Vulnerability map of West Bengal

The recent environmental studies envisage possibility of higher wind speed due to global (also local) Climate Changes. One of the most important climate change induced risk is that of cyclonic storms, storm surge and accompanying coastal inundation. A sea surface temperature (SST) rise of 2 to 4 °C, as expected in the Indian Ocean over the century, is expected to induce 10 to 20 percent increase in cyclone intensity (Aggarwal and Lal 2001).

Since cyclone formation frequency in the Bay of Bengal is about five times that of the ArabianSea (IMD, 1979, 1996, TARU, 2005), India's east coast is clearly at more risk. Two more recent studies have placed the coastal population at risk in South Asia at between 6 and 40 million. The first, World Bank-funded study (Dasgupta et.al, 2007) uses multiple scenarios ranging from 1 to 5 m of sea level rise, based on evidence of increased deglaciation rates in Greenland and Antarctica and the resultant increased probability of extreme climate scenarios. Up to 1 percent of India's urban areas could be inundated by 3 m Sea Level Rise (SLR), which could climb to almost 2 percent with a 5m rise. A 3 m SLR is also expected to impact above 1 percent of the population, which rises to 2.5 percent for a 5 m rise. Current awareness of climate change is unfortunately extremely thin and confined to a very very small population of educated urban dwellers, policy makers and business leaders. As the differential impact of changes in temperature, precipitation, storm frequency and sea level become more apparent, climate change is set to become an important political and economic issue also.

2.1.1.1. History of Past Major Wind & Cyclones in West Bengal

Table No. 2.2 : Past Catastrophes due to Wind & Cyclone in West Bengal

Period	Description
02–21/03/1833	The event occurred at Sagar Island/24 Paraganas with 3 m high surge and caused 50,000 deaths and about 100,000 cattle perished
03/10/1854	The surge went up to 12 m and water level increased at Kolkata and its vicinity. About 50,000 deaths reported
02–05/10/1864	Caused flooding up to 13 km on either side of the Hooghly River with 80,000 deaths Reported
05–01/11/1867	Reported to have damaged Port Canning, and caused 13 m high surge at Hatia and Bhola Islands
13–16/10/1874	About 3049 deaths reported
21–26/09/1887	No estimation of associated deaths
18–29/09/1916	Extensive damage reported; however, no estimation of deaths
14–16/10/1942	About 5 m high surge reported at Midnapur (64 km upstream in Hooghly River). Overall 15,000 deaths reported.
29/05/1956-01/06/1956	Caused flooding in Midnapur District, and also damage to agriculture due to saline water intrusion
27/09/1971-01/10/1971	Sixty people died and thousands of houses collapsed.
13–20/08/1974	Cyclonic storm over land with maximum wind speed of 139 kmph caused floods in several districts. Seven deaths reported.
12–11/09/1976	About 2.5 m high surge along with 1.4 m tide caused 40 deaths.
24–28/09/1981	Caused loss of five launches in the Bay and damage to many houses in Midnapur District.
09–14/10/1984	Caused damage in Midnapur district.
23–27/05/1989	Sixty-one persons died and thousands of cattle perished.
12-11-2002	Caused 78 deaths along with the destruction of agricultural crops and property.
25-05-2009	Cyclone AILA, caused huge damage to the North 24 Pargans, South 24-Parganas, Purba Midnapur and Kolkata. Death tolled to 146
12-10-2013	Cyclone caused by Phailin. Death of 23 persons in the District Purba Midnapur, Paschim Midnapur and Burdwan.

Source : DM Plan Govt. of west Bengal (Department of Disaster Management and Civil defence)

From the past record of wind and cyclone it is evident that cyclone is a common phenomenon in the coaster region of West Bengal and the most important urban conglomeration within the easy reach of tropical cyclonic storms in West Bengal is the state capital Kolkata. Therefore Kokata is in the high cyclone vulnerability and Risk zone.

2.1.2. Impact of Wind and Cyclone on Kolkata city

A mature tropical cyclone can release heat at the rate of 6x1014 Watts or more (NOAA, http://www.noaa. gov/questions/question_082900.html). The most devastating effects of a tropical cyclone occur when they cross coastline, making landfall. According to India Meteorological Department (website:

http:// www. imdmumbai.gov.in/ cycdisasters.htm) there are three elements associated with a cyclone, which cause destruction. These are:

1) Cyclones are associated with high-pressure gradients and consequent strong winds. These in turn, generate storm surges. A storm surge is an abnormal rise of sea level near the coast caused by a severe tropical cyclone; as a result, sea water inundates low lying areas of coastal regions drowning human beings and livestock, eroding beaches and embankments, destroying vegetation and reducing soil fertility.

2) Very strong winds may damage installations, dwellings, communication systems, trees, etc. resulting in damage to and loss of life and property. A few major examples of devastation were cited above.

3) Heavy and prolonged rains due to cyclones may cause river floods and submergence of low lying areas by rain causing loss of life and property. Floods and coastal inundation due to storm surges pollute drinking water sources.

It may be mentioned that all the three factors mentioned above occur simultaneously and, therefore, operations for distress mitigation become difficult.

Severe/ very severe Cyclonic storms will affect the slums and squatter settlements in the city more and cause extensive damage to the kutcha houses and considerable damage or collapse for the very weak non-engineered buildings associated with blowing up of roofs and various other things (e.g. light roof water tank, mobile towers, hoardings) not properly anchored to the buildings/structures. The most vulnerable urban residents are the poor, slum and squatter settlements dwellers and those who suffer from the multiple insecurities due to various unfortunate reasons. Through a long process of loss accumulation they are multiply challenged by even small events which impact their livelihoods, income, property, assets and sometimes their lives. Apart from social losses, occurrence of severe to super cyclone will result in huge economic losses to the people and all service providers.

Borough no III, VI, VII, IX, XII and XV having high number of slum dwellers (more than 1 lacs) are likely to be more affected besides the squatter settlements grown on the sides of Railways, canals and rivers. Dilapidated buildings in KMC area as mentioned in the Chapter. 2.5.2, are highly vulnerable. The city on the west is bound by the river Hooghly. As such, an intense rainfall during a tropical cyclone over this region means a lot of runoff since almost entire city area has been paved with little or no scope for natural infiltration. Ironically, the terrain of the land slopes from the west, at the edge of the river Hooghly, towards the east. Further east are the scattered salty marsh lands crisscrossed by the different tidal streams and channels that are connected to the Bay of Bengal in the south. The important creeks here are the Matla, Bidyadhari, Kultigong, Ichhamati, Raimangal etc. Of course, a small portion of the city, mainly to the south and closer to the river Hooghly drains to the west. However, whether the eastern tidal creeks, or the river Hooghly to the west, both are susceptible to water level variations of the ocean — the Bay of Bengal. This rise of water levels in the rivers is due to either only tidal variations or that coupled with a storm surge caused by a tropical cyclone. Under such a condition, when a lot of water needs to be discharged off from the city, the outfalls are found to be blocked off by a high water level of the drainage creeks. This renders the city waterlogged for many hours at a stretch several times.

2.1.3. Nature and Problems of Drainage Systems of Kolkata

The city of Kolkata and its surrounding urban spaces are confronted with serious problems of water logging as a result of cyclonic activities due to the following reasons. At the time of high cyclonic activity over the region causes a huge accumulation of runoff water, which has been increasing over the years due to paving of natural ground as a result of rapid urbanization. This water is drained, as mentioned before, through nearly 35 km long channels to the east of the city and discharged into the river Kultigang, which is connected to the Bay of Bengal through the tidal creek of Raymangal. As such, at the outfall point of the water channels, the normal tidal variation is such that a flow by gravity into Kultigang is only

possible for only about 7 to 8 hours a day. Naturally, at the time of a cyclone, the general water levels of the tidal creeks rise due a rise of the ocean level as a result of storm surges. This causes flow accumulation in the drainage channels which in turn causes backflow into the city. The water logging problem may be ascribed to the typical geographical feature of the city being of saucer type, the central portion being of lower elevation and pumping is required to remove the water logging as there is hardly any scope for gravitational drainage. The eastward drainage does not pose much serious problems while the areas, viz. Amherst Street, Thanthania, Chitpur, Free School Street, Camac Street, Sarat Basu Road where sewers have a north-south alignment have chronic water-logging problem. The inadequate road surface area of the city of only 6-8 percent aggravates the waterlogging problem. The storm water from the buildings instead of draining into the sewers through the yard gullies is discharged onto the inadequate road surface. Moreover, the gully pits on the roads, through which the water should drain out are inadequate in number and often choked. Further, rain washes solid waste to the mouths of gully pits, blocking the free flow of water into them. Besides, the city sewer system has no separate dry weather and storm weather flow arrangement thus resulting in major and minor underground trunk sewer lines being badly silted up for absence of proper cleaning at regular intervals and this has made the reduction in flowing capacity of storm water flow.

The encroachment of channel banks, indiscriminate dumping of waste and garbage in the channel further aggravated the problem. Rapid urbanization and increase in basin area cause drainage congestion. Huge siltation, indiscriminate dumping of solid wastes, unauthorized encroachment of the banks of canals, channels and rivers are the major problems.

High speed wind will cause tidal upsurge in the sea. If it gains considerable height above MSL, tidal waves will enter the city through the rivers and canals and inundate many areas (especially low lands) besides washing away some river/canal side residential areas & slums as the city land has an average elevation of 6.40m above MSL. Very strong storms will also cause buckling or overturning of Electric Poles / transformers associated with tearing off of electric wires. Consequences may include electrocution and outbreak of Fire in some congested places. Tree branches will be cut off and blown away.

Many trees will be uprooted. Many important Roads will be blocked by uprooted trees or broken tree branches or electric poles. Orissa and Andhra had similar experiences of wide spread disaster in the past few decades.

From the above information, it is now clear that unless the capacity for effective emergency response, relief, rehabilitation and mitigation is not built with utmost sincerity and in an integrated way to adequate extent against disasters, Kolkata will continue to have very high risk to damages by strong wind and cyclone.

2.2 EARTHQUAKE

Earthquake is a destructive natural event which accounts to tremendous loss of life and property damage. The greatest challenge facing our country is to reduce the vulnerability of this uncontrollable unpredictable natural hazard of immense strength by having a greater understanding about its causes and effects.

Earthquakes are the sudden immense **Jerks / Shaking / Rolling / Shocks** in the earth's crust.

Earthquakes happen along **"fault lines"** in the earth's crust.

Earthquakes can be felt over large areas although they usually **last for only a few seconds**.

Earthquakes **cannot be predicted** — although scientists are working on it.

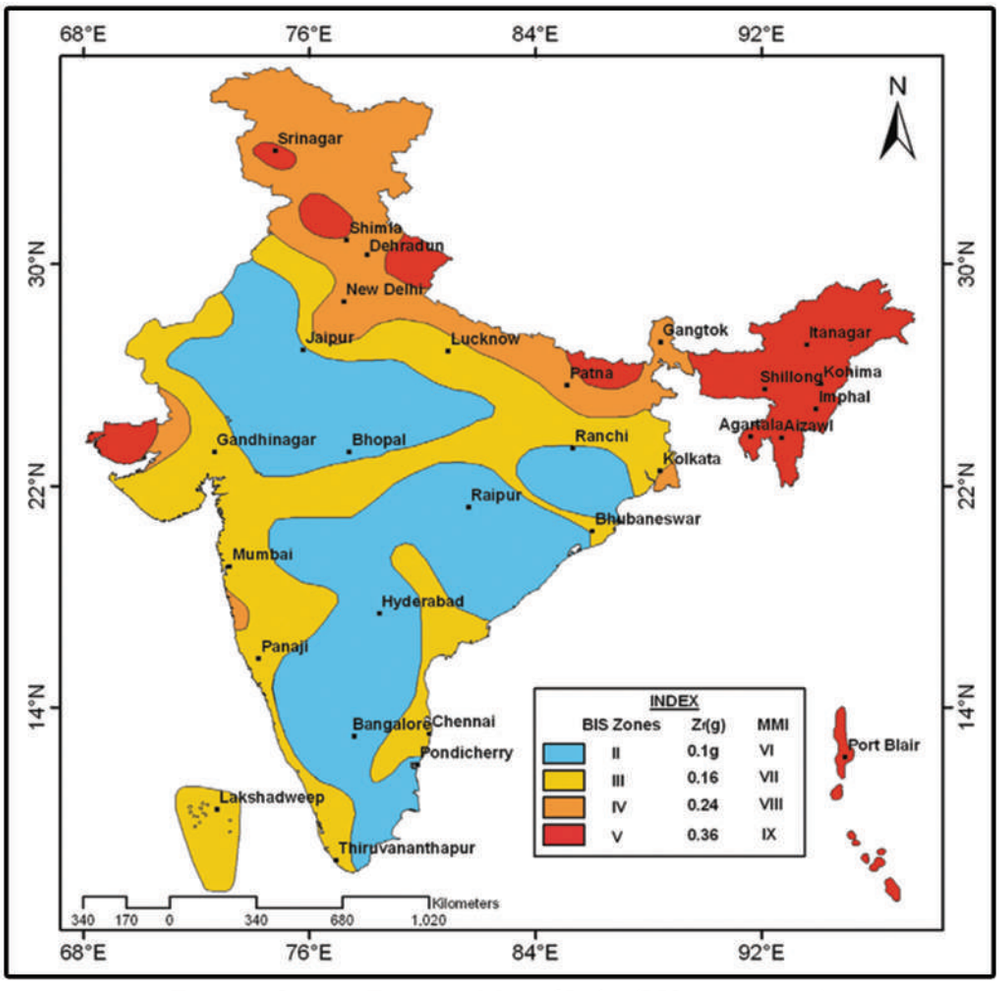
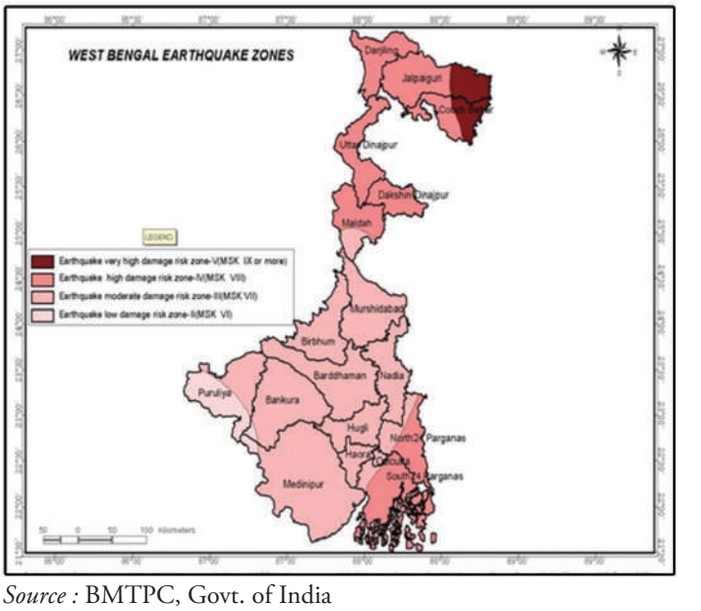


Fig.2.3 : Seismic Zonation Map of India (BIS, 1893-2002)

The Indian sub-continent is highly prone to natural disasters. Floods, Wind, Cyclones, Droughts and Earthquakes are recurrent phenomena. From Seismic Zonation Map of India by the BIS it can be said that Kolkata lies in the boundary of Zone III and IV of this zonation map and thus the city with a very high population is under risk of earthquake.

India has highly populated mega cities including the capital in New Delhi situated in zones of high seismic risk. Geologically **Kolkata falls within Moderate Earthquake Damage Risk Zone (Zone-III) within very close vicinity of High Earthquake Damage Risk Zone (Zone-IV) of North and South 24 Parganas districts** as can be seen in the following **Vulnerability Map of West Bengal due to Earthquake** (Fig.2.4) published by BMTPC(Govt. of India). Over and above this, some human induced factors as unsafe buildings, unplanned urbanization, dense population and habitats have increased it's vulnerability to disasters to considerable extent.



Source : BMTPC, Govt. of India

Fig. 2.4 : Earthquake Hazard Vulnerability Map of West Bengal

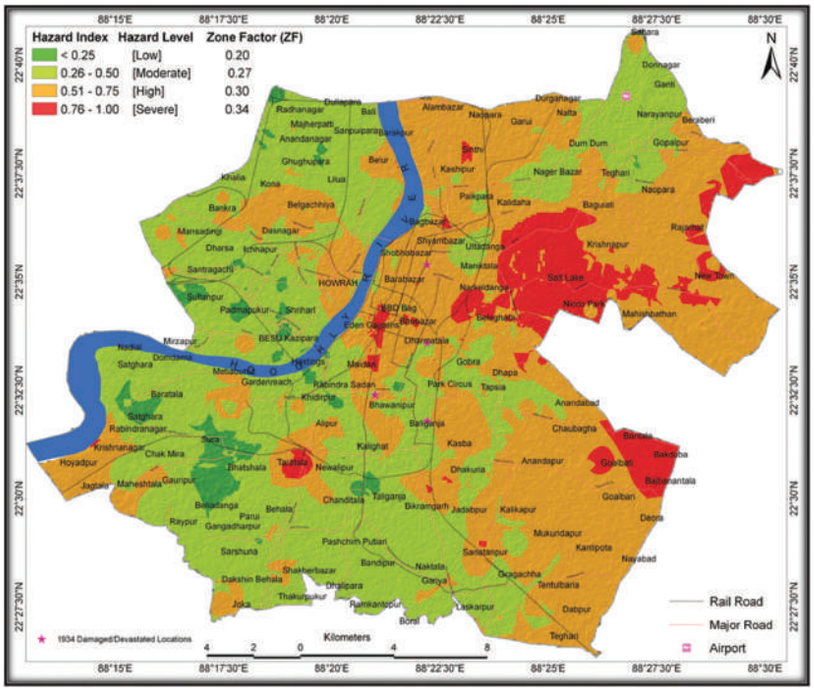
The records of some significant Earthquake which adversely affected in West Bengal are furnished below. But the epicentre of this earthquake did not always locate in West Bengal.

Table No. 2.3 : Some significant earthquakes

Year	Epicenter		Location	Magnitude
	Lat (Deg.N)	Long (Deg.E)		
10 June 1869	25	93	Near Cachar, Assam	7.5
12 June 1897	26	91	Silong Plateau	8.7
15 June 1934	26.6	86.8	Bihar-Nepal Boarder	8.3
23 October 1943	26.8	94	Assam	7.2
21 August 1988	26.72	86.63	Bihar-Nepal Boarder	6.4
20 April 2015	28.147	84.70	Nepal	7.8
12 May 2015	27.7	86.63	Bihar-Nepal Boarder	6.4

Source : State DM Plan, Government of West Bengal, 2016.

The past record of earthquake prove that *there is no place of complacency that earthquake will not happen here.* The seismic hazard microzonation map of Kolkata shows that the eastern part of Kolkata (salt lake , new town area) is falls under severe hazard level and nearly 50% of the areas shows in the map falls under high to severe hazard level and that means there is every possibilities that earthquake hazard can happen any time in future.



Source: Report of Geoscience Division, Ministry of Earth Sciences, Government of India on Seismic Hazard, Vulnerability and Risk Microzonation atlas of Kolkata

Fig.2.5 : Probabilistic Seismic Hazard Microzonation map of Kolkata. Four broad divisions have been identified with hazard index (HI) defined as 0.75<HI≤1.00 indicating severe hazard condition in Saltlake, New Town areas, 0.50<HI≤0.75 indicating High hazard condition mostly in Barabazar, Anandapur, Belgachiya, Bagdoba areas of the expanding City, 0.25< HI≤0.50 indicating moderate hazard condition in the most part of South and West Kolkata, while HI<0.25 presents a completely hazard free regime. The damage distribution due to the 1934 Bihar-Nepal earthquake of Mw 8.1 is mostly identified in the High to Severe Hazard zones (marked by a 'star mark')

Moreover, natural hazards know no geographical or political boundary and any considerable earthquake originating in Bangladesh, a very nearby and high disaster prone area, will affect our state and state capital. The Himalaya Belt is now highly active in tectonic movement. A big tremor originating at Bihar-Nepal border may be dangerous for the entire North Bengal as also for the weak structures in Kolkata (there are 3046 dilapidated building in KMC)

2.2.1. Possible Impact of Earthquake in Kolkata

As per the results of an exercise carried out under Global Seismic Hazard Assessment Programme (GSHAP) which found 86 potential seismic source zones in India, Kolkata may experience earthquake up to about 6.5 in the Richter scale (Intensity VII-IX on the MM scale) whose energy release will be around that of a hydrogen bomb of 1 mega ton capacity. Another Indo-US study on the assessment of damages due to earthquake of the above magnitude in Kolkata envisages development of cracks in many buildings/ structures even which are considered by people to be fairly strong and collapse of many weak buildings. It roughly estimated that about 40-50% buildings in the city may be affected by a 6.5 Richter quake. The graphical representation of dilapidated building can give an approximate idea of the more vulnerable buildings in the city (Chapter.2.5.2).

The report of Ministry of earth Sciences, Govt of India on Seismic Hazard, Vulnerability and Risk Microzonation Atlas of Kolkata revels that In Kolkata about 40% buildings fall under the high risk zone in and an around the central part of the City which is the oldest part of the Metropolitan whereas about 5-7% buildings are in the severe risk zone, most of which are located in the artificial non engineered filled-up regions. In the report the structural damage and its associated economic loss and casualty have been estimated for the maximum probable earthquake scenario of the city of Kolkata for a return period of 475years. From the report the extent of probable damage to transportation sector, buildings, medical services, education sectors etc due to major earthquake can be understand.

Like any other old city Kolkata has got a good number of old buildings many of which have crossed one or more centuries. Many buildings/structures constructed after independence were not built following proper engineering standards in regard to design, quality of materials and workmanship.

As the city is situated on young Alluvium of deltaic region containing mostly sand and silt in underground soil layers, the buildings (particularly which are not constructed on pile foundations or whose pile ends have not reached hard strata sufficiently) are also susceptible to settlement/tilting/overturning of foundations due to Liquefaction. Liquefaction may also result in coming out of water on the ground surface in some places.

An earthquake of considerable strength will highly affect the administrative functions and disrupt all essential services as transport (road and railways), power supply, water supply, health etc. and even sewerage & drainage of the city. The actual extent of damage due to earthquake however depends not only on the magnitude of the earthquake but also on various other factors e.g. depth of focus/hypocenter, type of soil through which shock waves will propagate, amplitude of S waves, types-stability-strengths of structures etc. It can be spelt without any doubt that the city of Kolkata is not at all prepared now to face a damaging earthquake. Well coordinated effort for effective capacity building at all levels (policy/administration to grass root) is necessary. Earthquake being the most dangerous of all hazards for the city, preparedness for it will mean that for all other disasters.

2.3 FLOOD

Inundation of different areas of the city of Kolkata has become a regular incident in every monsoon since years. Heavy showers of only 1-2 hours duration cause flooding of Kolkata streets. In fact flood is a common hazard for the state. A list of large floods in the state is given in Table No. 2.4.

Table No. 2.4 : Records of large floods in West Bengal

Period	Description
1988	Monsoonal rains caused flooding in areas of Balurghat and Dinajpur lying under the purview of the Ganges and Churani rivers
1991	Flash floods caused damage 35,000 houses
1995	Flooding triggered by heavy rains caused erosion, severe agricultural damage and outbreak of diseases
1998	Monsoon rains caused flooding of the Ganges river
1999	Tropical cyclones caused destruction of an estimated number of 1500 villages. Floods due to brief torrential rains affected areas of Kolkata, Burdwan and Birbhum
2000	Besides flash floods triggered by incessant torrential rains, disaster is also accredited to the opening of sluice gates of dams. The fatalities counted to the tune of 1262, besides affecting millions of people.
2002	Flooding in Jalpaiguri, Cooch Behar and Jalpaiguri in north Bengal due to monsoonal rains. Flash floods swamped ten villages, causing four deaths and 11,000 displacements
2003	Monsoonal rains caused floods affecting the regions of Darjeeling, Jalpaiguri, Malda and Murshidabad Heavy monsoonal rains affected several districts
2005	Heavy rains caused floods in many areas. About 3000 coastal villages were inundated and 60,000 huts and many roads washed away.
2005	Heavy monsoon rains triggered flash floods and landslides
2006	The regions of Birbhum, Burdwan and Murshidabad were affected mainly from continuous monsoonal downpour
2006	Monsoonal rains and tropical cyclone-driven storms in the Bay of Bengal hit India and Bangladesh. West Bengal recorded 50 deaths, 300 were injured and 30,000 mud houses destroyed. Heavy rains left large parts of Kolkata city under water; subsequently 2000 people were evacuated from the city.
2007	The hazard affected Kolkata and several other districts. Eighty-three deaths were reported, and millions of people were marooned in 3000 villages in coastal areas of the state
2007	Heavy rain from tropical depression in the Bay of Bengal caused flooding leading to 51 deaths, and affecting 3.2 million people
2013	Moderate flood occurred in 4 Dist.

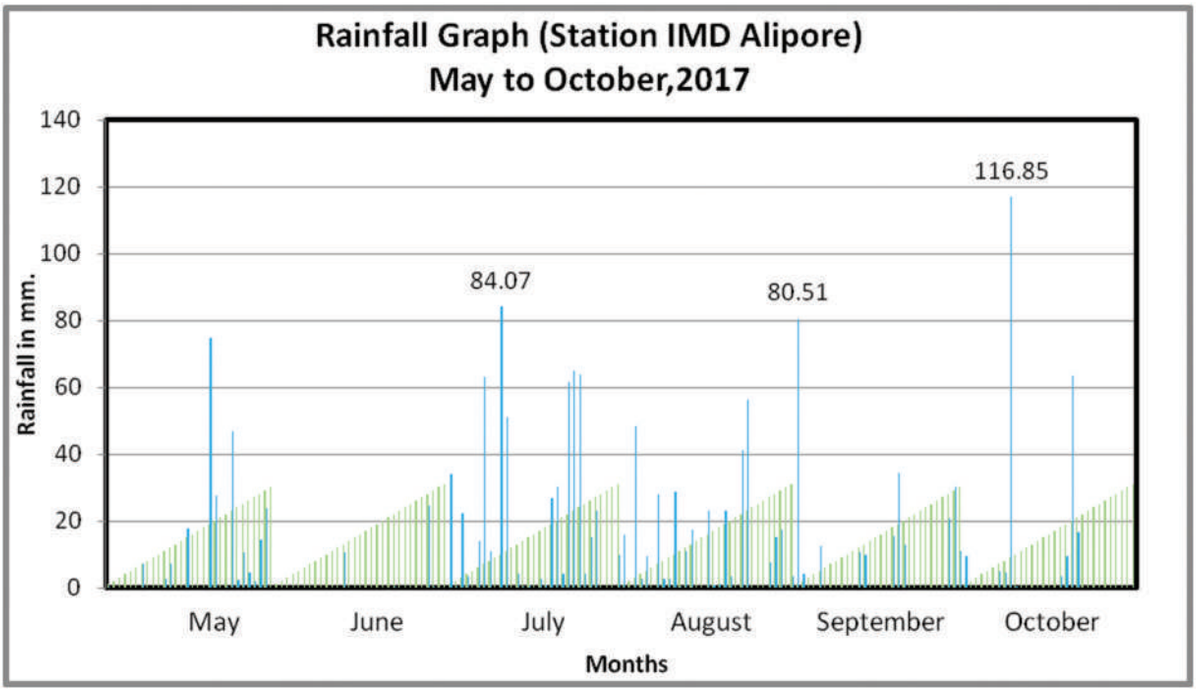
Source : West Bengal State Disaster Management Plan, 2016

Inundation of the city of Kolkata on a few occasions in every monsoon has become very common. Causes are almost same as discussed in the earlier chapter for Cyclone Risk. The causes for flooding may briefly be mentioned here again:-

1. The city topography reveals presence of saucer like low lying places which are easily inundated but require lot of time for bailing/draining out water. Pressure of population influx and administrative indifference since many decades led to improper land use and spread of habitation in low lands.

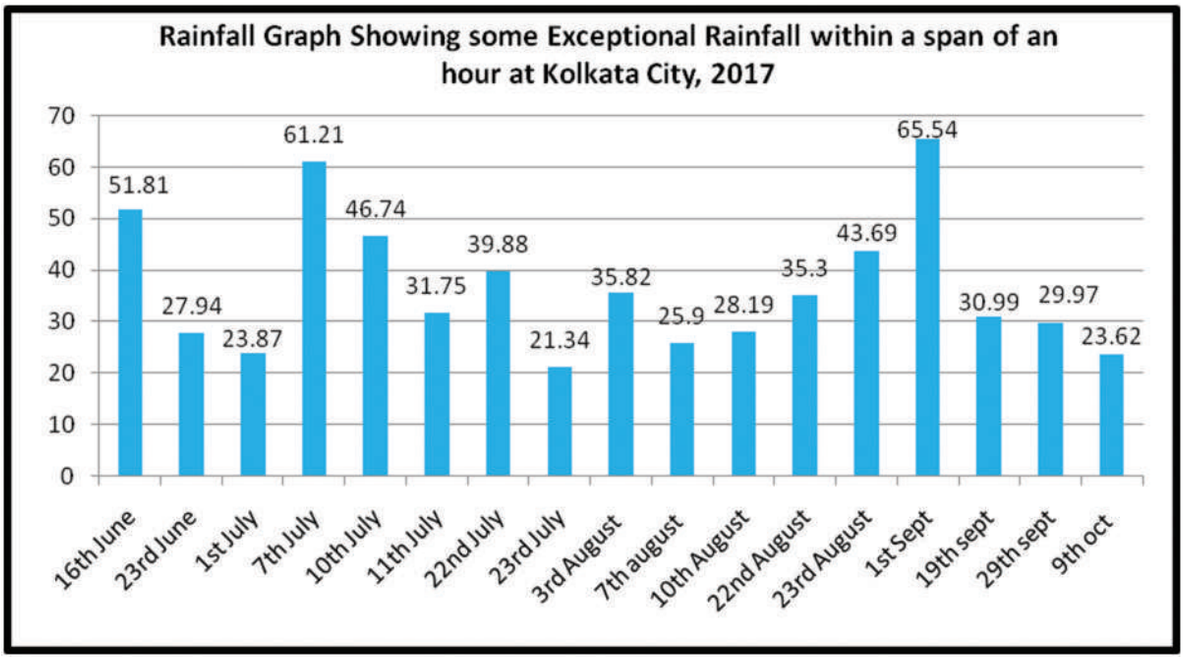
2. All the underground lines are combined sewers (carry both sewer and storm water). There is no separate arrangement for draining out storm water particularly when it is needed in the event of a high precipitation within a short time.
3. Most of the city drains are old which were designed to carry much less volume of effluents. With rapid rise in population and urban growth the drainage capacities were not augmented to carry increased volume of sewerage and storm water.
4. Most of the existing city drains are silted which has resulted in lowering of water retention and drainage capacities of those and increased time requirement for drainage of storm water.
5. The canals and rivers which receive sewerage/ storm water from the city drains are also heavily silted resulting in reduction of their water holding and water carrying capacities. Excessive siltation and consequent rise in their bed levels have invited additional problems of water level rise in them which causes back water thrust into the city drain lines.
6. Most of the said canals, channels and rivers are susceptible to water level variations of the ocean — the Bay of Bengal. Tidal water enters into these during high tides and storm surges.So, the coincidence of a heavy precipitation in and around the city catchment areas and tide water entry into the canals/ rivers increases drainage problems many fold.
7. Heavy rainfall in the upstream catchment area of the river Ganga or release of water fromFarakka Barrage in monsoon causes rise in water level.

It may be observed that though the drainage system of the city of Kolkata, as designed by William Clarke, was based on a probable rainfall of a quarter inch (6 mm) of rainfall an hour, which is equivalent to about 6 inches (150 mm) of rainfall in a day, there have been occasions when the rainfall has exceeded this amount leading to serious congestion of the storm disposal system leading to water logging in the city.



Data Source : weatherkolkata.in

Fig.2.6 : Daily Rainfall Graph of Kolkata (May – June, 2017)



Data Source : weatherkolkata.in

Fig. 2.7 : Rainfall Graph showing more than 20mm Rainfall in an hour

From the above graph it is evident that within a span o one hour the city of Kolkata experiences more than 20 mm rainfall in the month of June, July, August September and October. In the 1st September there was a intense rainfall in the afternoon, and within a one hour span Kolkata receives 65.54 mm rainfall, which causes serious water logging problem in the city.

2.3.1 Condition of Drainage System for Kolkata City

In the 2008 City Disaster Management plan it has been mentioned that the city sewer system has no separate dry weather and storm weather flow arrangement thus resulting in major and minor underground

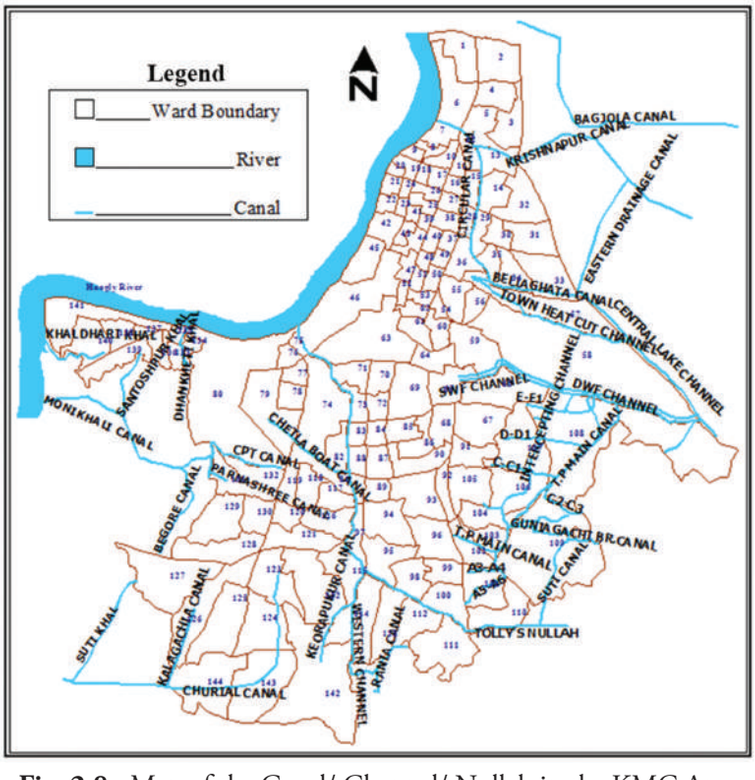


Fig. 2.8 : Map of the Canal/ Channel/ Nullah in the KMC Area

trunk sewer lines being badly silted up for absence of proper cleaning at regular intervals and this has made the reduction in flowing capacity of storm water flow considerably to the extent of an average of about 60 percent. This, in turn, has caused major silting up of most of the canals, the designed cross section of some of the important drainage canals have reduced to a great extent, raising the high flood levels in the canals. This, in turn, results in larger detention time of the flood waters in the city. The underground combined sewer network is not able to drain quickly into the open canal drains which are also incapable of quickly discharging the excess water into the rivers.

After that works of desiltation has been done by P&D department of KMC under JNNURM project. Out of total 88 km man entry brick sewer line, 25 km sewer line has been desilted and after desilting GRP Liner has been fixed. The areas, which has been covered in the disiltation project are:- Lenin Sarani, APC Road, Kolkata Street, Hazra Road, Rashbehari Avenue, Caning Street, Nimtala Ghat Street and Beadom Street. Out of 92 km non man entry brick sewer line, 30 km (approx) sewer line has been renovated. The department is preparing a DPR for disiltation after 23 km sewer line survey, and if this project is being implemented than water logging problem will be ease in many areas of Kolkata. Moreover Irrigation and Waterways Department also carry out the maintenance work of Canal to prevent water logging problem.

2.3.2 Flood- Prone Areas of Kolkata City

A list of Flood-prone areas of Kolkata city is given below:-

Table No. 2.5: Borough-wise List of Flood prone areas in the city of Kolkata

Borough	Ward No.	Water Logging Pockets
Borough - I	1	Gobinda Mondal Lane
	2	Sabji Bagan Bustee
	2	Dum Dum Road
	2	Kalicharan Ghosh Road
	2	Foara Bagan More (D. Gupta Road)
	2	Rajabagan Bustee
	2	South Sinthee Road
	3	Belgachia Bustee
	3	J. K. Ghosh Road
	3	Birpara Lane
	4	Raja Maninda Road
	4	Mitra Bagan Bustee (21, Dum Dum Road)
	4	Noongola Bustee (26, Dum Dum Road)
	5	Khelat Babu Lane
	5	Olai Chandi Mandir & Paresh Nath Temple
	5	Anath Babu Lane
	5	Indra Biswas Road
Borough – II	15	Crossing of N. B. Malliock Road and R. D. Street
	16	Sahitya Parishad Street
	17	Hari Ghosh Street
Borough – III	14	Satkari Mitra Lane
	29,30	Narkeldanga Main Road
	30	Sir Guru Das Road
	30	Dhan Debi Khanna Road
	31	Jogouddyan Lane Crossing of S. K. Daw Lane
	32	Bagmari Road (beside E.S.I. Hospital)

Borough	Ward No.	Water Logging Pockets
Borough – III	31,32	Manicktala (Underpass)
	34	Dr. Panchanan Mitra Lane
	34,35	Peary Mohan (Sur Garden Lane)
	35	Haromohon Ghosh Lane
	35	Kabi Sukanta Sarani
Borough – IV	25	Tarak Paramanick Road
	25	Muktarambabu Street
	27	Sukia Street
	38	Keshab Sen Street
	38	Amherst Street
	38	Bechu Chatterjee Street
	39	Vidya sagar street
	39	Rabindra Sarani
Borough – V	40	Surya Sen Street
	40	C. R. Avenue near Md. Ali Park
	40	Patua Tola Ln.
	40	Ramanath Majumdar St.
	40	Raja Rammohan Sarani & Narasingha Ln.
	40	College Row
	40,49	Bankim Chatterjee Street
	41	Muktaram Babu St.
	41	Madan Mohan Burman St.
	41	C.R.Ave.(From Mukta Ram Babu St. to Madan Mohan Burman Street)
	42	Rabindra Sarani (from 155B to 145B Rabindra Sarani)
	42	Brabourne Road and Strand Rd crossing
	43	C. R. Avenue (near M.G. Road) Eastern Flank
	43	C.R.ave.(From Syed Sally Ln. Prabhat Cinema Hall to Tara Chand Dutta st.)
	44	Amherst Street
	44	New CIT Road (from Srinath Babu Lane to Phears Lane) & Phears Ln. (from New CIT Road to Moulana Saukat ali St.)
	44	Sunyat Sen st. (from 22 Chata Wala Gully to Jn. Of R.Sarani) & Rabindra Sarani (from jn. Of Sunyat Sen St. to jn. Of B.B.Ganguly st. Eastern side)
	44	C.R.Ave.(from 63, C.R.ave. to 77,C.R.ave) & sun Yat Sen St. (from 77 C.R.Ave. to Jn. Of Phears Lane)
	44	Zakaria St. (from Nabab Badaruddin St. to C.R.Ave.)
	44	Madan Mohan Sen St. & Krishna Behari Sen St.(from M.G.Road to Anagarik Dharmapal St.)
	44	Nil Madhab Sen Ln. & Bhawani Dutta Ln. (from C.R.Ave. to College St.)
	45	B. B. D. Bag near Writers' Building
	45	Lalbazar St. (from Pr-20 to 18 Lalbazar St.)
	45	R.Sarani (from Pr-18 to 2 R.Sarani)

Borough	Ward No.	Water Logging Pockets
Borough – V	45	Radhabazar St. (from P-36 India Exchange Place to 18, Lal bazaar st.)
	45	Lyons Range
	45	Kiran Sankar Roy st. (from Pr. 8/2 to 2/1 Council House st.)
	48	B. B. Ganguly Street
	49	Baithakkhana Road (from Pr.1 to 24 M.G.Road)
	49	Scott Ln. (Crossing of Raja Rammohan Sarani to B.K.Rd.)
	49	Akhil Mistri Ln. (from Pr-1 to 124)
	49	Rajani Gupta Row (from 5, Akhil Mistri Ln. to 60, Akhil Mistri Ln.)
	49	Raj Chandra Sen Ln. (37 Scott. Ln. to 60, Akhil Mistry Ln.)
	49	Ram Hari Ghosh Ln. (15/A Raja Ram Mohan Sarani to 40, Rajani Gupta Row)
	49	Nil Moni Ganguli Ln. (from 4/2 Raja Ram Mohan Sarani to 9, Rajani Gupta Row)
Borough – VI	46	Chandni Metro Station
	46	Jn. Of Jawaharlal Nehru Rd. and S. N. Banerje Road (near Big Bazar)
	46	Profulla Sarkar Street (near A.B.P. & Pratidin)
	47	C.R. Avenue near Khadi Bhawan
	47	G.C. Avenue (Transport Gali)
	52	Karim Boksh Lane
	52	Collin Street (junction of Karim Boksh Lane)
	55	Ananda Palit Road
	55	46, Middle Road (Bye Lane)
	55	Sambhu Babu Lane
	55	Canal Street
	55	2A, 2B, 2C Chatu Babu Lane
	54, 60	Tanti Bagan Lane
	54,60	Anjuman Road (near Bell Masjid)
	61	Elliot Lane (portion)
	61	Ripon Lane (portion)
	62	1 to 10 Alimuddin Street
Borough – VII	58	Pulin Khatick Road
	58	Seal Lane
	58	11, Tangra 2nd Lane
	58	Arupota, Durgapur, Ananta Badal Village
	63	Camac Street(Portion)
	63	A. J. C. Bose Road near Mintu Park
	65	Iron Side Road
	65	93, Tiljala Road
	65	Tiljala Masjid Bari Lane
	65	Ballygunge Park
	66	Sridhar Roy Road

Borough	Ward No.	Water Logging Pockets
Borough – VII	66	Chowbhaga Road (Portion)
	66	Raicharan Ghosh Lane
Borough – VIII	70	Woodburn Road
	70	Judtice Dwaraklanath Road
	70	Justice Chandra Madhab Road
	70	Heyshyam Road
	72	Ramesh Mitra Road
	72	Townsend Road
	86	Dover Terrace
	87,90	Deshpriya Park
	90	Panchanantala Lane
	90	South End Park
	90	Kankulia Road
Borough – IX	74	Alipore Park Place
	74	Body Guard Lane
	76	Padmapukur
	77	Dent Mission
	78	Bhukailash Road
Borough – X	81	New Alipore Bl. 'J', 'G', 'D'
	81	Sahapur Colony
	81	2B, Chetla Road
	89	Sultan Alam Road (KMDA Housing Project Area)
	91	B.B. Chatterjee Road
	91	N. K. Ghosal Road
	91	Kumar Para Lane
	91	Kalu Para Lane
	91	Bosepukur
	91	Jahura Bazar Lane
	91	N.C. Chowdhury Road
	91	Kamala Park
	92	Selimpore(Baudir Dokan)
	92	Tanupukur Rd.
	92	Dhakuria Station Road near A.T. Chatterjee Market
	92	Sahid Nagar near Bypass Connector
	92	Najir Bagan More
	93	Lake Gardens (Punjabi Garriage, Gobindapur Rd.)
	93	Jodhpur park (Infront of E.D.F. Hospital, Children Park area)
	94	1 No. R.P. Colony
	94	P.G.M Saha Road
	94	Uday Sankar Sarani
	95	P.G.H. Shah Road
	95	Bikramgarh
	95	New Bikramgarh

Borough	Ward No.	Water Logging Pockets
Borough – X	96	Ibrahimpur Road
	96	Bijoygarh Jadavpur East Road
	98	4,5 Netaji Nagar
	99	3, Vidyasagar Colony (Nr. Lowland Kalibari)
	99	Near Pre. No. 65/1D, 65/1F, Jorabagan Road
	99	Near 62/8/1A Jorabagan Road (opp. /infront of Tarun Sangha Club)
	100	Naktala 2nd Scheme
Borough – XI	103	Modern park
	103	B.M. Mondal Road
	104	Bank Plot
	104	Jhil Road
	110	Southend Garden
	110	Briji West (Kadam Tala) A.T. Naskar School
	111	Sardar Para
	111	Junction of Charu Nagar and Pragati Park
	111	Rabindrapalli (D, E & F block)
	111	Ramkrishna Pally
	111	Malli Para
	112	Subhas Sarani
	112	Bandeali Palli
	112	Natun Bazar
	112	Pora Khola
	112	Naskarpara, Seikhpara
	113	Bansdroni Govt. Colony
	113	H.L. Sarkar Road
	113	Vivekanada Park
	114	Bagan Para
Borough – XII	101	B. P. Township (HB Block, CUG)
	101	Rabindrapalli (C Block)
	105	8 No. Sahid Nagar
	105	1,2 Sucheta nagar
	105	3, Jadav Garh
	105	Studio Lane
	105	Ghoshpara
	105	Kabardanga
	106	Sarat Park
	106	Sreehari Palli
	106	Eastern Park
	108	Hossenpur 2nd Lane & 4th Lane
	108	Martinpara, Gulsan Colony
	109	Sreenagar Main Road
	109	Purbalok

Borough	Ward No.	Water Logging Pockets
Borough – XII	109	Buderhut
	109	Ganga Nagar
	109	Jumana Nagar
	109	Rajapur D Block
	109	Nayabad Main Road
	109	Sammilani Park
	109	Sahid Smrity
	109	6A Mukundapur
Borough – XIII	115	Hafiz Md. Ishique Road near Masjid
	115	Taramoni Ghat Road (part)
	116	P.N. Mitra Lane (Dhopar Math)
	117	Gobarjhuri Bustee (part)
	117	Indirapally Bustee (part)
	118	S.N. Roy Road (Banstolla Bustee)
	119	Mondalpara Bustee
	119	Silthakur Bari Road (part)
	120	Co-Cala Bagan Road
	122	East Park
	122	Rabindra Abashan
	122	Surya Sen Pally
	122	Doctor Bagan
	122	Ram Krishna Nagar
	122	Sukanta Pally
	122	Arabindo Pally
	122	Mission Dhalli Para
	122	K.K. Road (near Masjid)
	122	Ishan Ghosh Road (near Basusree Bagan &Debnath Para)
Borough – XIV	121	Ambedkar Park
	121	Bhasapara, Ananda Pally, Sima Pally, Nabapally
	121	Mondalpara(portion)
	127	Bombai Bagan(Roy Dighi)
	127	Joyasree Park
	127	Upanaragi
	128	Basudevpur Majidpara
	128	L.N.Motilal Road(Malir Math)
	128	Santra Para
	128	Beni Master Lane
	128	Shyam Sunder Pally(1st & 2nd bye lane)
	129	Mahendra Banerjee Rd. (Adjoining Begor Khal),(Khetra Moni School), (Jagarani),Sreema Pally
	129	Jayrampur jala Road(Kundu Auto Surrounding)
	129	Sen Pally
	129	2No,3No,4No, Rabindra Nagar (Portion)

Borough	Ward No.	Water Logging Pockets
Borough – XIV	129	Goala Para Road
	129	B. G. Press Colony
	129	Nabapally Area
	129	Petlipara
	129	Parui Das Para
	129	Adarsa Nagar
	130	Bakshi Bagan
	130	Becharam Chatterjee Road(Sitala Mandir)
	130	Ramkrishna Sarani(Vivekananda Pally)
	130	Brahma Samaj Road(Mallick Colony)
	130	Dwarik Mukherjee Road(Jelepara)
	130	Netaji Subhas Road
	131	Dwijen Mukherjee Road
	131	Subhas Marg (Masala Bari)
	131	Santi Pally
	131	M.I.D, Road (Pallysree Pally)
	131	Swamiji Sarak
	131	Padmasree Pally
	132	Avoy vidya Lankar Road (Near Sitala Mandir)
	132	Upen Banerjee Road (Near Govt. Qtr.)
	132	Bishalakshmitala Road(51 no Bustee)
Borough – XV	133	Village Road
	136	Dewan Bagan
	136	Manasa Row
	136	Mali Bagan
	136	Fathepur 1st Bye Lane
	136	Kapi Bagan
	138	Admajola
	138	Dakait Bagan
	138 141	Chatkal Bustee
	139	Karbala Road
	139	Behala Colony and P.O. Lane
	140	Satghara Road
	141	Badartala Bus Stand
	141	Kanchan Tala
	141	Waris Nagar, Ayub Nagar
Borough – XVI	123	Prasanta Roy Road
	123	Kailash Ghosh Road near Dharapara
	123	Kailash Ghosh Road near S.T.P.
	123	Ishan Ghosh Road
	123	Bata Colony
	123	Santal Para
	123	Near Janakalyan

Borough	Ward No.	Water Logging Pockets
Borough – XVI	123	Near Silpara crossing of James Long Sarani
	123	Santosh Roy Road and James Long crossing towards Motilal Gupta Road
	124	Sahid purnendu nagar
	124	Mukunda Das Pally
	124	Das Para Milani Sangha
	124	Netaji Pally
	124	Vidya Sagar Sarani
	124	64 Pally
	124	Pragati Pally
	124	52 Pally
	125	Bhattacharjee Para near Venus Club
	125	Kadamtala near CESC Transformer
	125	Paner Ara
	125	Dakshin Para Jubak Gosthi
	125	Rajani Banerjee Road
	125	Bakhra Hat Road
	125	Marapota near Aurobinda Nagar
	125	2, Bachhar Para
	125	Kenaram Ganguly Road
	125	Baba Thakurtala
	125	Joykulla Molla Road
	125	Ananda Nagar
	125	Panch Maszid Road
	125	Pally Mongal Colony
	125	Padma Pukur near Sukanta Park
	125	Amritalal Mukherjee Road(Jora Mandir)
	125	S.B. Banerjee Road(L.I.C. Bazar)
	125	1, Bachar Para
	125	D.H.road opposite State Garage
	126	Kalicharan Dutta Road
	126	Ho Chi Min Sarani near Anjuman School
	126	Barisha Library near Dwadas Mandir School
	126	Parish Para near Doglas Ground
	126	Smashan Kalitala Road near Kali Mandir

Borough	Ward No.	Water Logging Pockets
Borough – XVI	126	Narayan Roy Road near Marriage Hall
	126	K. K. Roychoudhury Road near Chandi Mandir
	126	Brajamani Debya Road near Basudebpur Club
	126	Dakshin Behala Road near 7 Star Club
	126	Bakultala Road near Dutter Math
	126	Dakshin Behala Road near Akhtar Builders
	126	Jadab Ghosh Road near Tara Builders
	126	Subhas Pally near Sarkar Hat Lane
	126	Ananda Nagar C-Block
	126	Basundhara Park near Wood Furniture
	126	Kshudiram Pally near Club
	126	Talpukur Road near Lokenath Bhawan
	126	Shib Mandir near Silpara
	126	Mahamaya Math
	126	Talpukur Road
	142	Udayachal
	142	Bagan Para
	142	Purbayan Abasan
	142	Brick Field Road
	142	Ashabari
	142	Rong Para (Ramchandrapur)
	143	Prantik Phase I
	143	Prantik Phase II
	143	Prantik Phase III
	143	Dhalipara near STP
	143	Swapnakunja Abasan (Haridevpur)
	143	Dhali Para near Masjid
	143	Aurobinda Nagar
	143	Nazrul Sarani
	143	Mission Para
	143	22 Bigha
	143	Balaka
	144	Diamond Park
	144	Green Park
	144	Vivek Villa
	144	Swamiji Abasan
	144	Barui Para
	144	Hanspukur

Source : Sewerage and Drainage Department, KMC

With the increase of pumping station and numbers of pumps in KMC area the problem of water logging has been decreased from the previous years. Now there are 73 pumping staions and 5 sewarage treatment

plant in KMC area. Introduction of automatic pumps will be very much helpful to minimise the waterlogging problem of the city.

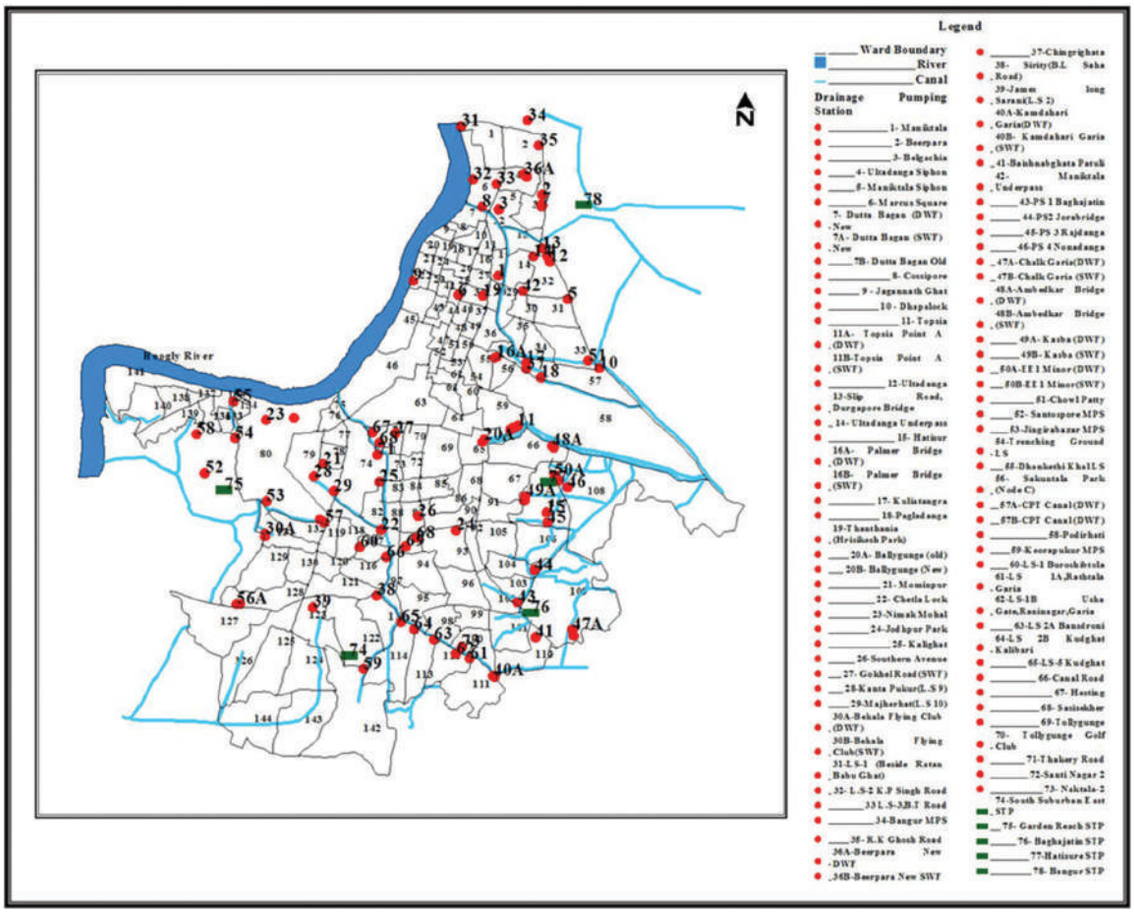


Fig. 2.9 : Map of the Drainage Pumping Stations and Sewerage Treatment Plants of KMC

Other than 73 Pumping station of KMC there are another 13 drainage pumping stations under other departments has been listed below.

Table No. 2.6 : List of Pumping stations of Different Departments in KMC area

Name of the Department	No of Pumping stations	Name of the Pumping Stations
Irrigation and waterways (I & W)	4	• Kulti PS • Chowbagha PS • Keorapukur PS • Manikhali PS
Public Health Engineering (PHE)	1	• Bangur PS
Kolkata Metropolitan development Authority (KMDA)	4	• Noapara PS • Galiff Street PS • Chingrighata PS (Canal South Road) • Anandapur PS
Kolkata Metropolitan Water and sanitation Authority (KMW&sa)	4	• Gouribari PS • Maniktala PS • Narkeldanga PS • Muraripukur PS

2.4 FIRE HAZARDS

Due mainly to the ignorance of people, damages/losses due to Fire are common in city life. In most of the cases fire becomes a considerable hazard in the congested market places where inflammable articles are used, sold or stored violating the related rules. Domestic fire is also very common but the losses are comparatively small. In both the cases of domestic or commercial fires, small fire starts from short circuit or negligent act of some person and then spreads out to adjoining places giving it a big shape. When fire becomes bigger and uncontrollable, emergency evacuation of men as well as materials becomes necessary but it also gets disturbed or becomes impossible due to want of adequate spaces or alternative escape routes in the building. So, risk of disaster due to fire remains inherent in the very construction or use of the building in most cases apart from the fact that preventive tools as fire extinguishers, sand, gunny bags etc. are not kept ready in hand as preparedness measure. Notwithstanding occurrences of so many fire disasters, even emergency contact numbers of Fire Services Stations are not kept by majority of the people.

Table No. 2.7 : 10 Pumps or above Fire Incidents under W.B.F & E.S in the Last 5 years

Division	Date	Address	Details of fire
South Kolkata	9.05.2013	Tollygunge Basti, Near tollygunge railway station	7 nos of basti hut containing household articles on fire, 14 pumps deployed
	03.11.2013	Marketing point. 21 Rakhal das auddy road, Kol-27	In a plywood factory having plywood materials, PVC doors, 1 Santro car,LPG cylinder on fire, 27 pumps deployed
North Kolkata	03.01.2013	11 Strand Bank Road, Kol-1, North Port PS	A godown of double storied building covering an area of 20,000sq. ft containing cables of Hindustan Lever, Rubber, chemicals on fire, 24 pumps deployed
	05.01.2013	24/A Rabindra Sarani, burrabazar PS	Huge quantity of medicated cotton on the 3rd floor of a G+4 storied residential building on fire, all the residents are rescued safely by brigade. 10 pumps deployed
	26.01.2013	Western side slum of the cannel of basanti colony adjacent P&T quarter, PS-Ultadanga	Out of the 500 house ,100 house containing household articled, plastics, kerosene oil, LPG Cylinder on fire, 4 rooms of BSNL office also affected. 29 pumps deployed
	12.02.2013	Bengal Saw mill.16/2 Cannel East Road. Kol-67	A sawmill (1500sq.ft) adjacent with Maruti Sujuki Service Centre was on fire,18 pumps deployed
	27.02.2013	Surya Sen Street,35 APC Road	A market building used as market &godown containing plastics, thermocol, utensils, kerosene, LPG Cylinder on fire, 17 person died, 4 person injured, 26 pumps deployed
	30.04.2013	15/3 Syed Sali Lane, Kolkata-7, PS-Jorasanko	In a basti huge quantity of boxes & Gani bag adjacent a Mini restaurant & a Mosque on fire, 16 pumps deployed

Division	Date	Address	Details of fire
South Kolkata	02.01.2014	G packaging, 68 G C dey Road, kol-15, PS- Tangra	A printing factory (2000sq.ft.) containing huge quantity of printing ink, solvent paint, adhesive and other chemical on fire, 6 civilian saved, 12 pumps deployed
	05.04.2014	Railway track of Park Circus railway station	200 slums both side of railway track having household articles, LPG cylinder on fire, 3 person received burn injury, 30 pumps deployed
	12.08.2014	8A Alipore road, Jindal House	B+G+12 storied building with car garage along with transformer on fire, 12 pumps deployed
	02.09.2014	Chatterjee International Building J.L Neheru Road	15th and 16th road containing office furniture, papers on fire, 6 persons rescued, 29 pumps deployed
South 24 Parganas	07.09.2014	Alchem Laboratory Pvt. Ltd. Budge budge Trunk road, PS-Mahestala	Huge quantity of medicine , AC machine, Office accessories on fire, 15 pumps deployed
	29.11.2014	Chandras Chemicals Enterprise Ltd. Budge Budge Trunk Road	An adhesive manufacturing plat containing adhesive material on fire, 22 pumps deployed
South Kolkata	10.04.2015	New secretariat Building, 1 Suren sarkar Roy Road, 7th floor	Chember of MIC Panchayet Dept.having official paper, AC machine, false cyling on fire,24 pumps deployed
	26.04.2015	City Mart, 3A Humayun Place, New Market PS	3rd floor, partially 1st,2nd,and 3rd floor containing huge quantity of garments,leather goods on fire, 26 pumps deployed
	18.05.2015	S.S. Hogg Market, fish, Asloo Bazar, PS-New Market	Market (12000sq.ft.) containing potatoes, packing box on fire, 22pumps deployed
	26.05.2015	482 Madoor daha, EM Bypass, Kalikapur	A laboratory of Bio medical section on 2nd floor having AC machine, scientific apparatus on fire, 15 pumps deployed
	30.07.2015	New Market Neli Sengupta Sarani, Kol-87	Several nos of garments shop having AC machine, furniture on fire, 15 pumps deployed
North Kolkata	02.02.2015	Bank of india, Raja Ram Mohan sarani	Huge quantity of plywood, timber, motor cycle on fire, 31 pumps deployed
South 24 Parganas	13.02.2015	Eureka forbs Ltd. P-41 Goragacha, Kol-18	4 nos of godown of huge quantities of tea, utensils on fire, 26 pumps deployed

Division	Date	Address	Details of fire
South Kolkata	13.01.2016	Brace Bridge Premises	Huge nos of basti covering area of 15000 sq. ft. on fire, 13 pumps deployed
	10.02.2016	85, Princep Street. CESE receiving and distribution centre	Inside CESE sub-station high tension cable line,switch gear, transformer on fire,14 pumps deployed
South Kolkata	21.03.2016	Ballygunge Science College, Calcutta University complex	A museum room containing chemicals, furniture, ppers, AC machine on fire, 11 persons rescued safely, 13 pumps deployed
	19.04.2016	56, Sayed Amir ali Avenue, Kol-19	7 nos of car parked in basement of B_6 storyed building on fire, 11 pumps deployed
	02.10.2016	Krishna Metallic Pvt. Ltd. 32/1 Lenin Sarani. PS- New Market	Diff types of Aluminium frames, furniture, electrical fitting on fire, 25 pumps deployed
	21.11.2016	Top floor of Ronald Ross Building,SSKM Hospital	1 central library room having computers, electronics goods on fire, 19 pumps deployed
	04.12.2016	South City Mall,375 Prince Anwar Shah Road. PS-Jadavpur	False cyling of food court on fire, 23 pumps deployed
South Kolkata	29.01.2017	15 South Sealdah/road. PS-Entally	A factory shed (10000 sq ft) having thinner, tar, burnish machinery on fire, 19 pumps deployed.
	30.03.2017	Hotel Golden Park, 14 HoChimin Sarani	A server room at 1st floor containining chair table adjacent 2 hall rooms top floor on fire, 31 boarder rescued, 2 person died by smoke, 12 pumps deployed.
	25.04.2017	5 Star Market, 26 Karl marks Sarani	2 garments shop on 5th floor having readymade garments, computers furniture, AC machine on fire, 11 pumps deployed
	20.07.2017	12 Pritoria street, PS-Shakespeer Sarani	In a 3rd floor office having office records, furniture, computers on fire, 10 pumps deployed
	04.08.2017	Office of Emami,781 Anandapur	An office (10000sq ft) having computer, furniture, false cling on fire, 12 pumps deployed
North Kolkata	27.02.2017	3 Amartala Lane. Kol-1	A 3 storied building containing umbrella, leather bags, plastics bags on fire, 39 pumps deployed.

Source : Department of Fire and emergency services, Govt. of West Bengal

After the fire incident at 35, A.P.C.Road commonly known as Surya Sen Market, Hon'ble Chief Minister, Govt. of W.B. Smt. Mamata Banerjee directed the KMC to survey all the markets which are situated within the city of Kolkata. According to the survey report there are 358 markets within the jurisdiction of KMC area. Out of which 41 are owned and managed by KMC market department and rest are private or others markets. The survey report highlighted the fire safety arrangements in different markets on different parameters.

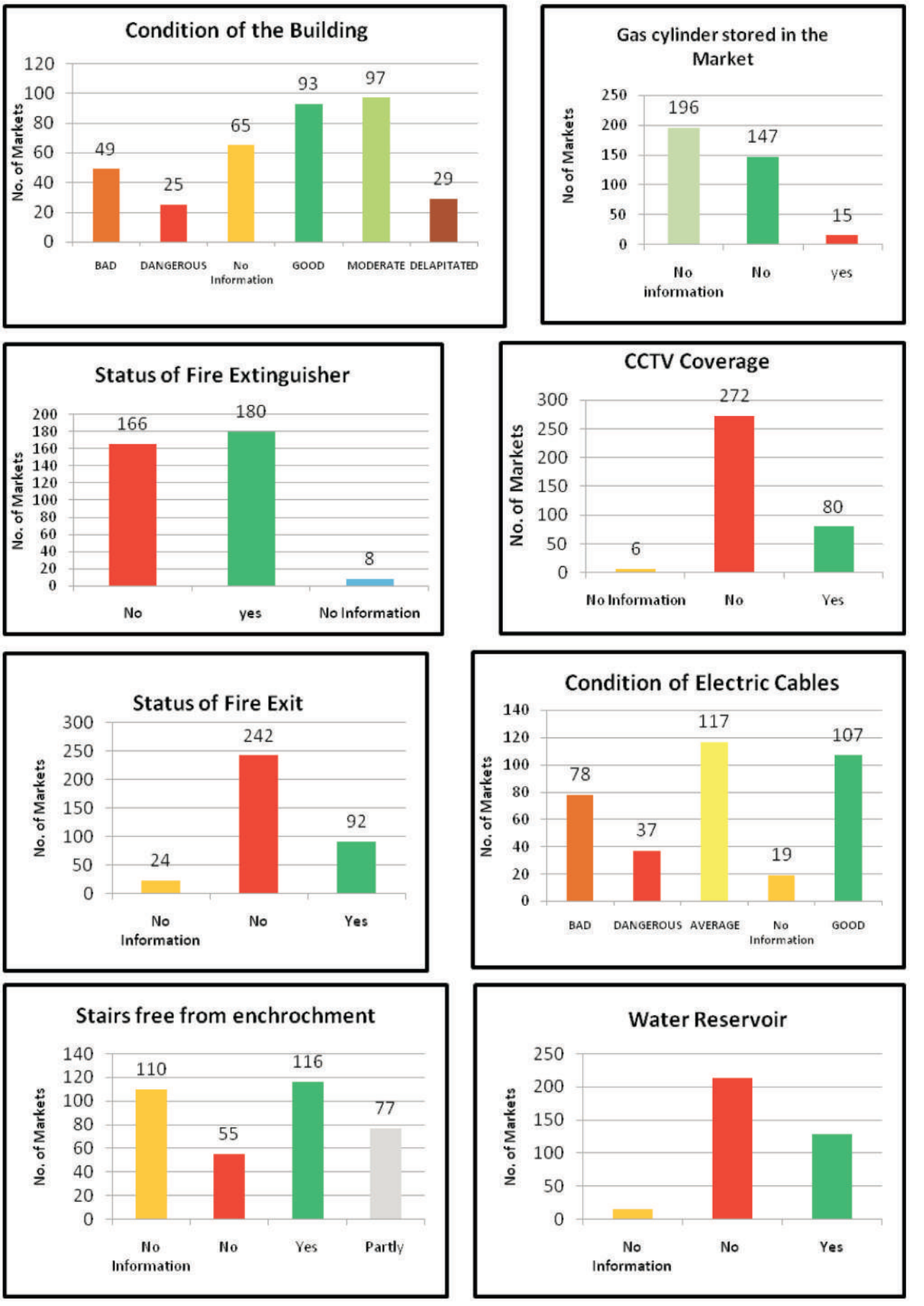


Fig. 2.10 : fire safety arrangements in the markets within the jurisdiction of KMC areas (Data Source: Market Inspection Report of KMC, 2013)

A brief summary of the report is highlighted in the Fig.2.10, which will be helpful to identify the vulnerable areas of fire hazard as well as show a path for the planning to tackle and prevent the hazard.

The WBF&ES Dept. is maintaining a record of fire safety measures in market places, shopping mall, factories and industrial estate where damage will be more due to fire incident.till November 2011 they are keeping this record for 61 places. This data will help to aware the industries and mall to renewal the fire safety certificate also will be help to identify the vulnerable areas.

2.5 OTHER HAZARDS

2.5.1 Road accidents

Traffic accidents, accidental deaths, injuries, damages to properties and associated social tension have become a matter of great concern in the large cities like Kolkata. From the statistics given in the following table it is apparent that road accident is a regular phenomenon in the city and need more attention to minimise the number of injuries and deaths.

Table No. 2.8 : Trend of Road Accidents

	No of Road accidents			No of Deaths			No. of Injuries		
	2015	2016	2017	2015	2016	2017	2015	2016	2017
Up to November	4303	4138	3208	462	458	364	3349	3188	2613
Total	**4726**	**4469**		**510**	**488**		**3646**	**3469**	

Source : Transport Department, Govt. of West Bengal

Police have identified a few accident prone locations in Kolkata on the basis of the intensity and frequency of the accidents. Most of the fatal accidents occur to pedestrians while crossing the roads. It is seen that BT Road, AJC Bose Road, Strand Road, EM By-pass, APC Roy Road are the most accident prone roads in Kolkata.

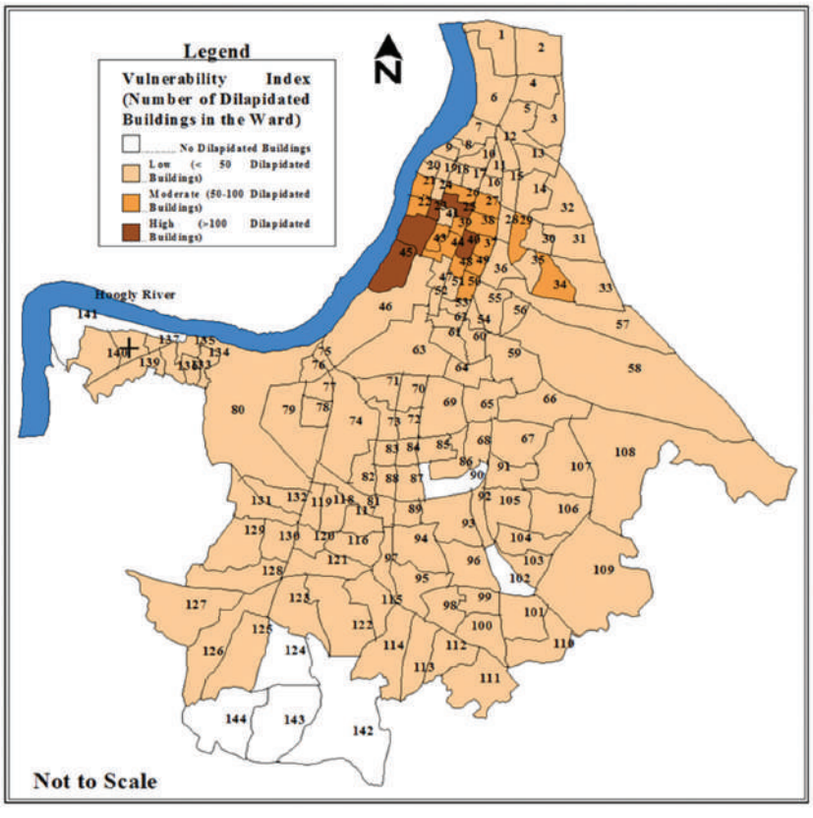
2.5.2 Building Collapse

Like any other old city Kolkata has got approx 3046 number of old buildings many of which have crossed one or more centuries. Many people reside in these dilapidated buildings and any incident of collapse of these building can cause loss of human life. During rainy season the problem of collapse gets increased.

Photo : Incident of Dilapidate Building Collapse at Burrabazar (*Source :* NDTV)

Some incidents of dilapidated building collapse in the year 2017 have been listed below:-

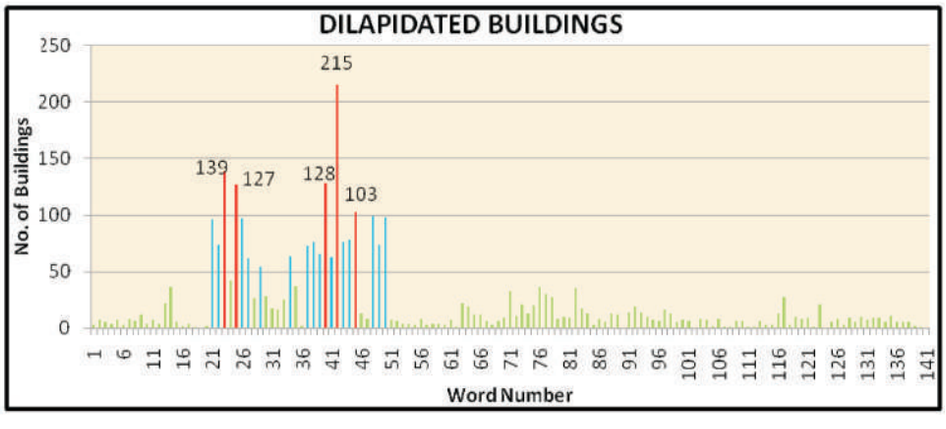
- Two people died due to an old two-storeyed building collapse in central Kolkata's Taltala on 25th july, 2017.
- Three persons died due to a dilapidated building collapsed in North Kolkata's congested Burrabazar area (16 Shibtala Street) on 5th September, 2017. The upper floors of the building collapsed and fell on the side where the family have been living.



Data Source : KMC

Fig.2.11 : Building Collapse Vulnerability Index Map of KMC Area

There are 3046 (approx) dilapidated building in the KMC area. The maximum numbers of dilapidated buildings (215) has been observed in the ward number 42 and 139, 128 127 and 103 numbers of dilapidated buildings has been observed in the ward number 23,40, 25 and 45 respectively. It has been observed that the numbers of dilapidated buildings are more than 50 in 15 wards. Therefore it is necessary to prepare an action plan to demolish the buildings as soon as possible.



Data Source : Building Department, KMC

Fig.2.12 : Dilapidated buildings of the KMC area

2.5.3 Health hazards

KMC provides primary health care services in the city of Kolkata. KMC health Department provides such public health services in the 16 boroughs comprising of 144 wards through its 16 Borough Health Offices, 144 urban primary Health Centres (UPHCs)/ Ward Health Units (each also functioning as mini dispensary), 145 Malaria Clinics, Charitable Dispensaries, Leprosy Clinics, Maternity Homes, Regular Immunization Centres, DOTs Centres, Chest Clinics & MTMTB Hospital, Food & Water Analyst Department, Birth Registration Department, Public Safety Department, Ambulance Service, Slaughter Houses & Modern Abattoir, Burning Ghats & Burial Ground and Mortuary, thus ensuring a complete holistic approach of provision of all categories of public health service from womb to the tomb.

The quality of life of the citizens of Kolkata though under strict surveillance throughout the year, is also occassionaly subject to certain emerging 'Health Hazards' that have potentials to disrupt or damage or increase morbidity or in extreme condition increase mortality of the citizens of this city. The major disease processes that may cause great concern in this city include dengue and malaria, details of which are given below-

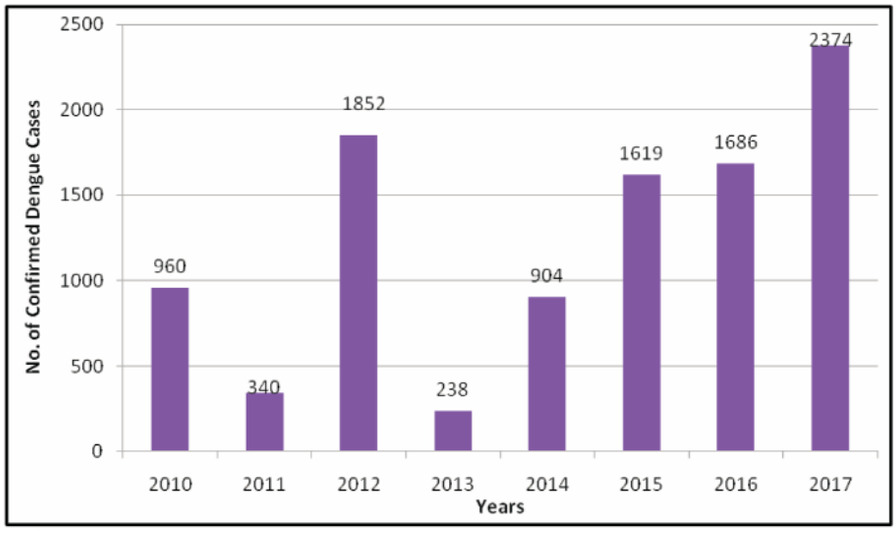


Fig.2.13 : Dengue Scenario in KMC Area (Data Source: Health Department,) KMC

The city Malaria burden in 2017 (5405 cases) has been reduced by an overwhelming margin of 94.4% by comparison with figure of 2010 (96909) and the quantum of reduction of the number of PF cases in 2014 has been 97.6 % also. On the other hand number of Dengue cases has increased in 2017 by 59.56% from the year 2010. Therefore main focus for managing health hazards should be Dengue prevention.

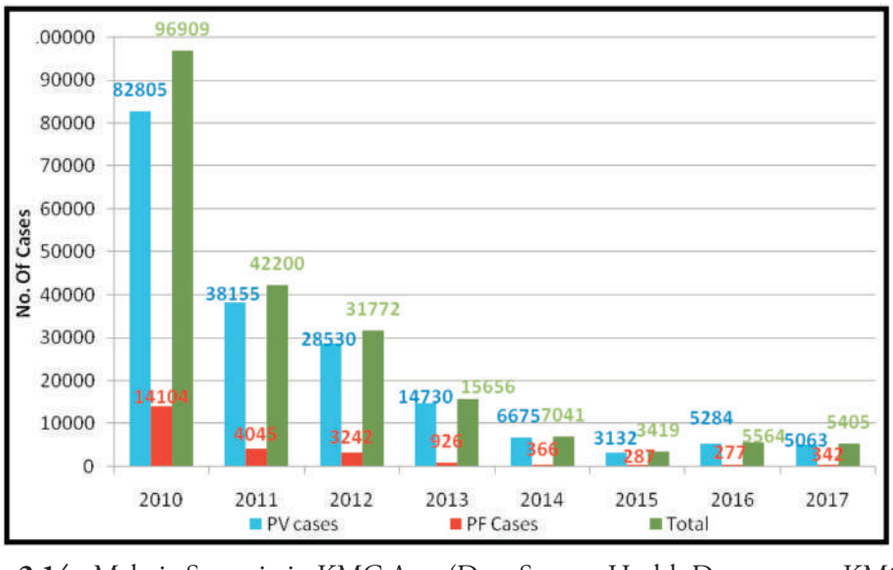


Fig.2.14 : Malaria Scenario in KMC Area (Data Source: Health Department, KMC)

2.5.4 Climate change

The inter-governmental panel on Climate Change (IPCC) defines climate change as: "a change in the state of the climate that can be identified (e.g., by using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer. Climate change may be due to natural internal processes or external forcing, or to persistent anthropogenic changes in the composition of the atmosphere or in land use."

The United Nations Framework Convention on Climate Change (UNFCCC) defines climate change as "a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods.

The West Bengal State Action Plan for Climate Change (SAPCC) was prepared by a Committee led by the Government of West Bengal in 2011. The SAPCC highlights the criticality of Kolkata as a region prone to flood expansion during cyclonic storm surges due to inadequacies in the area's infrastructure, land-use, socio-economic and environmental conditions, and drainage capacity of existing sewerage systems. Evidence of salt-water intrusion has been seen in the form of enhanced soil salinity tested up to 40 kilometres from Kolkata after the cyclonic storm Aila (source: roadmap for low carbon And climate resilient Kolkata)

Kolkata is the fifth highest amongst major cities in India emitting 14.8 million tons of greenhouse gases (GHG) I. It is also the second highest contributor in terms of per capita CO2 emission producing 3.29 tons of CO2 per capita II. Emissions in Kolkata are projected to increase by some 54% by 2025 based on 2014 level. Around 70% of Kolkata's 15 million inhabitants suffer from some form of respiratory problems caused by pollution from the city's transport sector. An article published by 'Times of India' earlier in year 2015 suggests that Kolkata is the only other Indian city, other than Delhi, which is predicted to record the highest number of deaths through inhalation of polluted air by 2050. A study conducted by the West Bengal State Pollution Control Board (WBPCB) forecasts a decline in the share of pollution from industrial sources, but an increase in pollution from automobiles that affects the human beings maximum and conversion of open spaces (10% to total city area)and water bodies into built-up areas (78% to total city area). Road vehicles also contribute significantly to particulate matter of size class of 1.1 micron. Further studies carried out by the World Bank in a variety of cities have proved that nearly half of the total exposure to particulates that make people ill, can be linked to pollution emanating from road vehicles. (source: roadmap for low carbon And climate resilient Kolkata)

In the year 2013 UK Government signed a MOU with Kolkata Municipal Corporation on low carbon and climate resilient Kolkata. After this agreement KMC prepared a Road Map for Low Carbon and climate Resilient Kolkata. In this road map different sectors has been identified which are responsible for increasing Green House Gas emission. According to the report building sector is the highest contributor of Green House Gases in Kolkata, and other sectors are waste sector, transportation sector etc. in this report different short term, medium term and long term action plans has been given and KMC is working following these plans to make low carbon and climate resilient Kolkata. Some of the proposed plans were Roof top Solar, Roof top Garden, Rain water harvesting etc.

3 Disastar Management Stratrgy

The National Disaster Management Act, 2005 has defined Disaster Management — as a continuous and integrated process of planning, organizing, coordinating and implementing measures which are necessary or expedient for —

- Prevention of danger or threat of any dissaster;
- Mitigation or reduction of risk of any disaster or its severity or consequences;
- Capacity building;
- Preparedness to deal with any disaster;
- Prompt response to any threatening disaster situation or disaster;
- Assessing the severity or magnitude of effects of any disaster;
- Evacuation, rescue and relief;
- Rehabilitation and reconstruction

While the occurrences of human induced hazards can be prevented or minimized to a great extent by a well aware and responsible administration with the help of a conscious community, natural hazards are not preventable as occurrences of those depend on complicated natural changes. But the effects of these natural hazards on civilization and environment at a given place and time can be minimized by reduction of risk of disasters by adopting mitigation measures, building attitude and capacities of administration and the community in timely and effective emergency response, relief and rehabilitation activities. Thus disaster management requires proper and sufficient actions in pre, during and post disaster times

3.1 DISASTER MITIGATION MEASURES FOR KOLKATA

The hazard mitigation endeavours start with pre-event actions for prevention, mitigation and preparedness. Immediate response is anticipated during occurrence of a disaster. On the other hand, the post-disaster steps account for rehabilitation, reconstruction, gathering of informations and reconcilliation. Strategic approach necessitates identification and quantification of hazard and subsequent risk assessment. The hazard assessment involves gathering of information, precise to an acceptable extent, on the probable site, the associated severity and likelihood of occurrence within a specific time-period. The analysis incorporates geological and geomorphological scientific data as well as statistical records of past occurrences. The local specific hazard information developed through synthesis of the available and processed data can be produced in the form of a hazard map/atlas. In holistic approach, a vulnerability map reflecting a multi-hazard scenario can be developed and integrated on priority and weightage basis towards risk assessment. Risk assessment involves quantification of anticipated loss or damage from the projected hazard. The analysis of risk is achieved through integration of results from hazard analysis and vulnerability assessment. Vulnerability is mostly accounted for by landuse accompanied by various combinations of factors like, rapid urbanization, improper construction practices, inadequately enforced building bylaws, socio-economic attributes, lack of awareness, environmental degradation and lack of preparedness. Based on delivered risk assessment, further mitigational activities can be formulated. Capacity building programmes may be enforced following recognization of the needs and the hazard priority.

Any disaster needs to be tackled through a sequence of long term mitigation measures andshort term action plans involving pre-disaster, during disaster and post-disaster measures as mentioned above. The long term mitigation measures or the pre disaster measures needs to be well integrated with the existing development plans and ongoing infrastructural improvements being carried out in the city for arriving at a well drafted and implementable disaster management strategy. The process of Disaster Mitigation will include simultaneous actions for improvement of infrastructure along with education, awareness

generation, training, capacity development, better preparedness, knowledge sharing in terms of disaster risk management and recovery among all people at community, district and state levels. Strengthening of disaster management information system for accurate and timely dissemination of warning at national, state, district and local levels is also an essential task. Establishing linkages and proper coordination between the government and civil society response plans and capacity building of government institutions and the local self-governments in disaster mitigation, preparedness and recovery are must, as without these the mitigation measures will never be effective. In view of the vulnerabilities and the risk identified in the earlier sections, the mitigation measures proposed/adopted have been categorized into three major headings :

- **Strengthening and improvement of existing infrastructure of KMC**
  - Control Room
  - Water Supply
  - Solid waste management
  - Lighting and electricity
  - Sewerage and Drainage
  - Health Services
  - Building
  - Roads
  - Early Warning and Information Dissemination system
- **Awareness generation, Training and Capacity building of people at all levels (from administration to grass root level)**
- **Enactment and proper enforcement of suitable legislations related to land use policies and planning, town & country planning, building bye laws.**

3.1.1 Strengthening and Improvement of Existing Infrastructure

Infrastructure improvement for Kolkata has been examined in terms of real time management of various possible disasters in this region.

Control Room

KMC Control Room functions round the clock throughout the year. In KMC control room there is a LED screen where rainfall, temperature, water level and humidity data for every 15 minutes interval is being displayed for 16 stations in Kolkata. This is very much important for managing flood situation in monsoon season. An emergency Operating Centre (EOC) will be created at KMC for better management of Disaster Situation.

Water Supply Department

- Kolkata was earlier covering the City Proper and Jadavpur Unit, South Suburban Unit and Garden Reach Unit spread over 141 Wards and 15 Borough. Recently three (3) wards Joka area has been added to KMC area and now KMC area covers total 144 Wards within the limitation of 16 Boroughs. Tallah-Palta water service district provides filtered water to city proper particularly north, central and part of south Kolkata. Garden Reach water service district covers some parts of City Proper, Jadavpur Unit, S. S. Unit and Garden Reach Unit. The facilities are supplemented by ground water. Presently KMC has 325 nos. big dia. tubewells for providing ground water where surface water source is inadequate. Further Joka area is under developing stage and now mainly feed with ground water source.
- Initially filter water was coming from Palta Water Works and Stored at Tallah Pumping Station from where water pumped out for distribution in the city. Due to growth of the city, facility

of pumping became inadequate for even distribution of water pressure to the consumer point. KMC has constructed several Headworks to boost up the water pressure in the locality during supply hours.

- KMC has successfully commissioned Palta Tallah Dedicated 64" Transmission Main under JnNURM on 22nd September, 2012.
- KMC has constructed 30 MGD Water Treatment Plant at Dhapa to provide water to the adjoining area of E.M. Bypass as well as to cover scarcity of Zone of Eastern Fringe of Kolkata City, where potable water was being provided through Big Dia. Tube Well.
- Recent Approved Reservoir Projects are Kayasthapara – 0.40 MG, Panchanagram – 0.20 MG, Panchasayar – 0.11 MG, Achena Park – 0.19 MG, Bangur Park – 0.40 MG, Sachindranath Sengupta Park, Agrasi Math, Hindustan Park, Rajani Mukherjee Road, Cocola Bagan, Nagendra Udayan

The objective of development in the sector of water supply is to ensure availability of safe potable water to all. To achieve this basic objective, norms & standard for water supply has been marginally adjusted to utilize the existing facilities to the maximum extent. As a part of this effort KMC is now planned to strengthen its existing installation as well. Notwithstanding to speak that Retrofitting programme of Century old Tallah Elevated Steel Reservoir will enrich KMC to serve the Citizen in a better way. Water Loss Management Project at Cossipore area will help KMC to generate awareness to the people of this segment as well as to extend filter water duration to 24X7 as against 18 hours a day at present. KMC also plan to extend supply duration in the other part of the city by envisaging similar type water loss management programme there. As a part of strengthening existing infrastructure KMC has planned to take up shore protection work to safeguard its biggest WTP at Palta. Efforts are to be made to reduce wastage. Special attention need to pay to ensure that quality of water remains within stipulated standards. Due considerations have been given for the economically weaker section and their social habits. Initiatives have also been taken to extend treated surface water supply to the doorsteps of the residents of the city and as a part of this, KMC has now planned to augment its storage capacity alongwith treatment facilities, so that safe drinking water can be provided to the citizen. KMC has also planned to closed down its ground water source and replace it by treated surface water.

Solid waste Department

- There are 78 Modern Scientific Waste Compactor Stations within KMC area and another 78 stations will be constructed in future.
- Waste processing Technology adopted windrow composting
- Land fill site 12.6 hector dump site is closed as per the MSW Rule 2016, and bio remediation project has already been taken up by the KMC and west Bengal pollution control Board under the financial assistance of World Bank, Central Government and State government.
- Project for conversion of organic Market Waste into Bio CNG Bio CO2 and Compost will be completed in near future.

Lighting and Electricity Department

- In many places street lighting has been converted to LED, which reduces the power consumption of each light from 400W to 180/200 w and 250 W to 120/130 W respectively.
- KMC has introduced solar power LED lighting system in Deshapriya Park, Jatin Das Park and Maddox Square for creating Carbon Neutral Park. The same project is under process in College Square, Patuli Upanagari Park, Deshabandhu Park, Sarsuna Park and Mohinikunja Udyan. In future Solar LED Lighting System will be introduce in Tala Jhill Park, Santosh mitra square, Raja subodh Mallik Square, Ladies Park, Paddapukur Square, Md. Ali Park,

Park Circus Maidan, Rabindra Kanan, Park at Cannel South Rd., Vivekananda Udyan at Parnasree, Auckland Square, Hazi md. Mohsin Square, Kheyali Park, Bhagini Nibedita udyan, Shyam Park, Kumartuli Park, Chandi Ghosh Park, Harish Mukherjee Park, D.N. Mitra Park, Triangular Park, Sukumar Roy Udyan and Subhas Sarobar Park.

- In future KMC is going to introduce a Floating Solar Project, 250 KW power will directly go to grid.
- Roof Top Solar has been introduced in different buildings of KMC for eco friendly power generation.
- Fire Alarm System has been installed in MTMTB Hospital and Planning and Development Building.
- Security Guard of different KMC buildings has taken 5 days training on fire safety.
- There is a Night Gang in each borough for emergency services like potable pump operation, provide light for demolition of building at night during monsoon.
- Lightning Arrester has been installed in different KMC buildings.

Sewerage and Drainage Department

- To prevent the pollution of Ganga Kolkata Environment improvement programme (KEIP) has been implemented. In order to prevent Sewage discharge from Borough I, XI, XII, XIV and XV directly to the River Ganga 3 STPs, namely South Suburbun East, Bangur and Garden Reach has been constructed in the first phase (2002 to 2013). The said scheme encompass development of S&D system in wards 1-6, 11-114 (part), 115,122,123 (part), 128-132, 133-138, 139-140 (part). Total capacity of the STPs is 154 MLD.
- In KEIP project total 248 km S&D network has been developed, 9 new pumping stations has been constructed and 19 pumping stations has been augmented in the 1st phase (2002-2013)
- In the 2nd phase (2014-2022) of the project KEIIP 155 km S&D network will be developed, 14 new pumping stations will be constructed, 1 pumping station will be augmented and 3 STPs will be constructed namely Jindagor, Kalagachhiya and suti.

Health Department

Plans of KMC Health Department to prevent and manage different health hazards

- Prompt detection and treatment of malaria through 145 KMC-run Malaria Clinics.
- Prompt detection of dengue through KMC-run 15 Dengue Detection Centres (DDC). A chain of 15 (Fifteen) state of art Dengue Detection Centres (DDC), have been built and the same are functioning effectively, whereby the sophisticated and costly dengue detection facilities (as per WHO guidelines) have been made available to the citizens of Kolkata free of cost. The diagnostic tests undertaken for detection of dengue fever are NS1 &IgM, both by ELISA methodology.
- Provision for procurement of a wide range of drugs (70-80 types), consisting of general medicines, antibiotics, anti-diabetics, anti-hypertensive, anti-tubercular etc and distribution of the same free f cost to the beneficiaries attending KMC Health Infrastructures.
- Provision for laboratory investigations like TC, DC, Hb%, ESR, Platlet Count, blood sugar already present and undertaken free of cost for the beneficiaries attending KMC Health Infrastructures. Plan for more sophisticated examinations in the future is already under consideration and so is the establishment/ functioning of Mobile Medical Units.
- Prevention and control of Vector Borne Diseases
  - Rallies on Dengue Control at HQ and 144 Wards in January,2018
  - Workshops for Primary Care Physicians attended by Ward Councillor, Medical Officers, Laboratory Technicians, health Supervisors, Borough Vector Control In Charges and other

health officials of the department. Experts from the Directorate of NVBDCP (ROH&FW, Kolkata) and Calcutta School of tropical Medicine, government of west Bengal, are present in the workshop as resource persons.

- Reorientation training on vector control: Reorientation training on methodologies of vector control for all categories of staff including 16 Borough Vector Control In Charges, 144 Ward Vector Control- In- Charges and Field Workers conducted under supervision of Chief VCO and 3 Consultant Entomologists.
- Data Bank on Mosquito Breeding Sources: A 9048 – page Data bank was created by digitised ward-wise information regarding addresses of all potential mosquito breeding sources collected during 2013. Released by the Honurable Mayor and the Honourable MMIC (Health) on 17th July,2014. This data bank is presently helping the department streamline its city-wide drive for detection and destruction of mosquito larve. This Data Bank is updated every year and include lists of number of masonry tanks, open overhead water tanks, seepage water-holding sites, wells, open drains, ponds, slum clusters and under-construction buildings in the KMC area. The vector control squads of the department keep these potential breeding sources under strict vigil throughout the year.
- Legal cell expedites the process of filing of cases in the Municipal Court against the erring people, in violation of the anti-mosquito guidelines of KMC. A substantial number of cases are filed every year in the Learned Municipal Court for prevention of mosquito breeding in and around human-dwellings, besides issuance of legal notices u/S 496 (ii) of the KMC Act,1980
- Drive for source reduction undertaken from the beginning of the season [by detection and destruction of the mother foci of malaria and dengue-bearing species (Anopheles stephensi and Aedes aegypti respectively] is undertaken in different wards of KMC by 24 Rapid Action Teams [8 CRATs and 16 BRATs] and the Field Workers of different Ward Healthunits right from January.
- House visits undertaken by Honorary Health workers for fever survey and by WBUES workers for distribution of IEC materials are carried out throughout the year.
- Exemplary Dengue Surveillance System: one staff in each KMC ward is designated to collect dengue/ malaria-reports from different private pathological laboratories, hospitals, nursing homes and other non-KMC diagnostic Centres located in the ward. In all 144 such dedicated staffs (called Morning Data Collectors) visits the non-KMC health set-ups to collect reports, right from January2014, throughout the year, on a daily basis. The information collecting system is unique in India.
- Vector control activities registered as per formats: vector control activities carried out by Field Workers in all the 144 wards of KMC, 16 Borough Rapid action Teams and 8 Central Rapid Action Teams are recorded on a daily basis as per the entomological formats provided by the Vector Control Department.
- Larvicidal spray using rowing boats are carried out in different culex-genic canals, using 20 KMC-owned small rowing-boats as transport throughout the year. People of around 46 wards get benefit from this anti-mosquito drive.
- Prompt removal of accumulated solid wastes from wards in collaboration with the SWM Department.
- Inter sectorial meetings at Borough /Ward Levels
- Source reduction Drive by Rapid action Teams: schools, Colleges, Universities, market places, medical colleges and hospitals, under construction buildings, office buildings are inspected by 24 Rapid Action Teams (8 Central Rapid Action Teams and 16 Borough Rapid Action Teams) on a regular basis throughout the year.

- Weekly review meeting on vector-borne disease control programme with Deputy CMHOs, Chief Vector Control Officer, Borough Executive Health Officers, Consultant Entomologists and other concerned officials of the department is held in the chamber of Chief Municipal Health officer on a regular basis. MMIC 9Health) is present in many of these meeting.
- Video conferencing: inter departmental video conference on every third Thursday of the month, is held throughout the year in presence of the MC, Joint MC and controlling officers of all concerned departments – including health, SWM, Building, Engineering and Drainage etc.
- Administrative meetings at all 16 Boroughs undertaken by MMIC (Health) every year.
- Awareness Raising Activities: IEC activities in the form of awareness-raising meetings involving ward councillors, multi-coloured banners, colourful hoardings, sun-pack boards are put up at different busy intersections across the city. Booklets (Bengali, Hindi and Urdu), multilingual leaflets against both malaria and dengue are printed in adequate amounts and distributed among the city-dwellers. A documentary film is screened for 2 consecutive months by using 3 publicity vans (each fitted with LED screen). Auto – miking twice a week is done in every KMC ward over a span of months and awareness kiosks/service-oriented health camps are organised on a felt need basis. Besides these FM campaigns and TV slots are also utilised for awareness raising on vector borne diseases.

- Integrated Disease Surveillance Programme (IDSP): IDSP (KMC) is performing as District Nodal Agency for the city of Kolkata in respect to surveillance of all types of occurrences of communicable and non-communicable disease within the jurisdiction of the city of Kolkata. Under the control of KMC with assistance of Govt. of west Bengal and GOI, the unit is responsible for maintenance of all kinds of records and generation of information, forecasting of outbreaks of any communicable disease, planning for prevention of occurrences of different diseases and promotion of health of the city dwellers as well as containing the spread of any such communicable diseases in the city etc. A record of occurrences of such diseases is maintained in NIC (India) through the standard reporting formats of L, P and S Forms. Manual Surveillance System (MSS) has already been up-graded to authentic, secure and cost effective Digital data Communication System (DDCS) in 2015-2016. Presently the reporting system has been further up-graded to a GIS-based on-line (web based) Real Time Digital Health Management Information system (HMIS) with the provisions for instant inputs of field level data. Data Analytic Division is also to be incorporated in HMIS in the future with further provisions for control measures.

Slum Department

The people who are residing at Slums are the most vulnerable people to any kind of disaster. There are some initiatives taken by KMC and KMDA for rehabilitation of Slum dwellers.

- KMC and KMDA constructed 2000 flat for slum dwellers in rajarghat, ward no 108 under Basic Service for Urban Poor (BSUP) Project.
- KMC constructed flats for slum dwellers in Behala Senpally, ward no 132 and Garden Reach, ward No.139 under Basic Service for Urban Poor (BSUP) Project.
- Another project of BSUP in Mayerbari area, ward no 7 is under process.

Building Department

Kolkata, like other old cites, has got a good stock of weak/dilapidated old buildings. Though the design of buildings for earthquake and wind was made mandatory by KMC building bye laws long ago, lack of proper quality control and engineering supervision were the main reasons.

- After visual assessment, owner of each dilapidated building is issued notice (U/S 411 (1) of KMC Act, 1980) by KMC and people are alerted by hanging a notice board on that building as

a usual practice. Till now KMC issued notice to more than 3000 buildings. This activity should be intensified by quick assessment to cover as much building as possible within short time span.

- Rule 142 of Building rules, 2009, allows owners to enjoy additional 100 percent space of tenant occupied portion. Provided they will rehabilitate the tenants. This will resolve the issue of dilapidated buildings which often pose serious threats in the city.
- As per the Kokata Municipal Building Rules, 2009, for earthquake protection a Structural Engineer shall design the structure taking into consideration the Indian Standard Codes {(i) IS: 1893- 2002 : "Criteria for Earthquake Resistant Design of Structures (Fifth Revision)," (ii) IS: 13920-1993: "Ductile Detailing of Reinforced Concrete Structures subjected to Seismic Forces Code of Practice," (iii) IS: 4326 - 1993 : "Earthquake Resistant Design and Construction of Buildings - Code of Practice (Second Revision)," (iv) IS: 13828-1993 : "Improving Earthquake Resistance of Low Strength Masonry Buildings - Guidelines" (v) IS: 13827- 1993 : "Improving Earthquake Resistance of Earthen Buildings - Guidelines (vi) IS: 13935-1993 : "Repair and Seismic Strengthening of Buildings-Guidelines}" . In addition to the above, provisions of National Building Code are also to be taken into consideration for design purpose.
- For fire safety KMC do not sanction any building plan without fire clearance.

Early Warning and Information Dissemination system

As a positive effort towards disaster management, KMC's Control Room functions round the clock throughout the year and KMC keeps touch with India Meteorological Department, Kolkata in case of major threat of natural hazards. KMC has implemented a project to monitor rainfall at various locations of the city of Kolkata and surroundings, which may provide quick information on the state of possible inundation in the city. There is a website called weatherkolkta.in, which gives information of temperature, Rainfall, humidity, barometric pressure for total 16 stations in 15 minutes intervals. In addition, the water level in the sumps of some the drainage and sewerage pumping stations are being monitored for providing an estimate of the water accumulating at these stations (especially during the monsoon rains), and how many pumps may need to be deployed to evacuate the bulk of the water. Still the control room requires more strengthening with modern equipments and capacity enhancement. KMC is planning to create a EOC (Emergency Operating Centre) for better management of disasters within KMC area. For efficient co-ordination and effective response, communication amongst government, NGO/private stakeholder departments/ organizations is essential and should be given very high priority.

3.1.2. Awareness Generation, Training and Capacity Building of people at all (administration to grass root) levels

- Since 2005 KMC has been implementing URBAN EARTHQUAKE VULNERABILITY REDUCTION PROJECT (UEVRP), a sub-component of the Govt. of India – UNDP Disaster Risk Management Programme (a national initiative covering disaster prone 17 states and 38 populous cities in India). The Dept. of Disaster Management, Govt. of West Bengal is the state nodal department for implementation of DRMP. Following activities were done till 2008.

  a. About 250 senior officers including quite a few at policy/decision making level of a few stake holder organizations were sensitized under UEVRP on the risk of disasters and Dos & Don'ts.

  b. A few responsible officers of a few departments of KMC have received training on disaster management.

  c. 99 Engineers and 104 Construction Workers were trained in disaster resistant construction technology.

d. More than 400 students and 466 school teachers were sensitized / trained on disaster management.

e. About a thosasnd community members were sensitized.

f. IEC materials on dos and donts for earthquake hazard were distributed in all the above meetings. Govt. of West Bengal and govt. of India are also disseminating these through news papers, radio and television all of which are increasing awareness levels of people of the city.

- In the year 2015 KMC organised a workshop (2 days) to sensitise school and college students.
- In the year 2017 total 17 officials from Building Department, Sewerage and Drainage Department, Health Department, Disaster Management Unit and Education Department of KMC were trained in 2 days workshop on Urban risk Reduction at Tran Bhawan.
- In the year 2018 KMC organised different Rally in the Kolkata city to aware people about dengue.
- KMC has displayed banners in different parts of Kolkata to aware people about the dengue and dilapidated buildings in Kolkata.

3.2 ROLES OF OTHER DIFFERENT GOVERNMENT DEPARTMENTS TO PREVENT AND MANAGE ANY DISASTER IN KOLKATA CITY

Apart from different works conducted by Kolkata Municipal Corporation there are several plans of other Government departments to prevent and manage disasters in Kolkata

Kolkata Police (Disaster Management Group)

Disaster happens with little or no warning causing death and destruction and serious disruption of normal life; to reduce the impact of disaster, DMG Kolkata Police was raised in 2002 for disaster risk reduction process. This small but potent unit of Kolkata Police is required to respond in short period of time to mitigate the impact of various kind of disaster within the city of Kolkata and adjoining areas. In the year 2002 DMG started with water wing team and rescued the victims from the pond, lakes, rivers, wells frequently. After 2009 Tree Cutting Team and CSSR,MFR (collapsed Structure Search & Rescue, Medical First Responder) teams have been created and they got various trainings from different renowned/prestigious training institutions of India for quick response and mitigate the sufferings of affected people in the event of natural and man - made disaster. The main roles and responsibilities of the 3 wings of Disaster Management Group of Kolkata police has been mentioned below:-

- **CSSR**
  - Collapsed structure evacuation
  - Road Traffic Accident
  - Fire Evacuation
  - Removal of trees
  - IPL/ISL Matches
  - NOTE – At times work in tandem.
- **WATER**
  - Drowning incidents
  - Immersion duty during various pujas
  - VIP escort in river

- Recovery of equipments
- Water logging

DMG,KP primarily is an operational wing usually functions under IRS mechanism which reduces adhocism and incorporates all the tasks that may need to be performed during the response having proper unity of command with proper flexibility and multitasking ability. When situation demands, task force, strike teams are formed with able leader at the head of the responding group. Priority is given for the extrication of trapped victim/ about to be drowned victim from danger zone.

The DMG, Kolkata Police have actively participated in various events regarding disaster awareness and Mock drills organised by other departments.

- Earthquake drill conducted by NDMA and Indian Army where DMG, KP participated along with other stakeholders.
- DMG, Kolkata Police active participated in Tsunami Mock Drill conducted at three coastal districts of West Bengal where local people were made alert regarding the severity of the natural calamity.
- DMG, Kolkata Police attended the Seminar at Jadavpur University on Disaster management and presented overall functioning of DMG, KP in the seminar.
- Diploma students of Jadavpur University imparted basic understanding of disasters and related mitigation.
- Students of Various Schools were shown the activities of DMG, KP at PTS.

DMG, Kolkata Police has already prepared a HR policy in which they have clearly mentioned the selection procedure of disaster Management personnel and training process too, so that they can create a dedicated group of disaster management.

Transport Department

The transport department is working on River Safety, Road safety and Pollution control. The details of their initiatives have been mentioned below:-

- Transport Department has taken up various initiatives for river safety. This department has waved out a standard Operating Procedure (SOP) and implemented it in 415 Jetties/Ferry Ghats of the state for the safer river transport.
- Transport Department has introduced the Jaladhara Scheme to convert semi –mechanised boats to mechanised ones to avert accidents.
- The department has taken up various initiatives for road safety. Process of retrofitment of Speed Limiting devices (SLD) in existing transport vehicles has been initiated. Funds have been provided for taking various types of road safety measures like Integreted Traffic Management System and Surveillance System, laser based Speed radar Gun and Enforcer Camera, CCTV surveillance etc. Road safety awareness program 'Safe Drive Save Life' has been arranged. Arrangement of Trauma Care Ambulances, Motor Bike and app based identification of traffic system has also been introduced.
- As per rules it is mandatory for every vehicle owner to carry a valid Pollution Under Control Certificate (PUCC) and maintain the vehicle in such a condition so as to make it compliant with the prescribed emission norms. Any vehicle on the road needs to have a valid Pollution Under Control (PUC) certificate.

The future plan for pollution control and road safety has been mentioned in the following table

Table No. 3.1 : Future Plan of Transport Department for Pollution Control and Road Safety

State Objectives relevant to the Goals & Targets	Components of each objective	Key Initiatives / Actions Undertaken or Proposed Short Term (Year 2020)	Key Initiatives / Actions Undertaken or Proposed Medium Term (Year 2025)	Key Initiatives / Actions Undertaken or Proposed Long Term (Year 2030)
Activities on Road Safety	"Safe Drive Save Life" Campaign.	"Safe Drive Save Life" Campaign would be made all over the state in transport sector.	"Safe Drive Save Life" Campaign would be made all over the state in transport sector.	"Safe Drive Save Life" Campaign would be made all over the state in transport sector.
	Augmentation of funds for procurement of traffic equipment, signals for road safety.	Attempts will be made to equip all the important traffic intersection points with modern traffic furniture/equipment/ signals etc. in city areas.	Attempts will be made to equip all the important traffic intersection points with modern traffic furniture/equipment/ signals etc. in district HQs.	Attempts will be made to equip all the important traffic intersection points with modern traffic furniture/equipment/ signals etc. in Block level.
Pollution Measures	Reduction of pollution due to automobile sector by launching of eco-friendly fuel /battery operated vehicle/ e-rickshaw.	Eco-friendly fuel /battery operated passenger vehicles / e-rickshaw will be promoted in the areas of city and district town.	Eco-friendly fuel /battery operated passenger vehicles / e-rickshaw will be promoted in the areas of Sub-division / Municipality of the State.	Eco-friendly fuel / battery operated passenger vehicles / e-rickshaw will be promoted in the rural areas of the State.
	Modification of Pollution testing centre	Increase number of pollution testing centre.	Increase number of pollution testing centre and make networking.	Introduction of mobile pollution testing system.

Source : Transport Department, Govt. of west Bengal

Fire and Emergency services Department

Fire and Emergency Department has a standard Operating Procedure for disaster management activities. Some of the activities, performed by the department have been mentioned below:

- West Bengal Fire & Emergency Services plays an important role in the area of fire fighting and rescue of lives and saving properties from the ravages of fire. Apart from fire fighting this department also undertakes rescue jobs and has saved hundreds of people from any types of disaster like house collapse, accidents, cyclones, floods, and other natural & manmade disaster.
- Besides above this department has a statutory, regulatory and advisory function also. Advisory functions relate to educating society & community on fire protection measures thereby helping them to implement the fire safety measures. The statutory function is to ensure that business houses, commercial & industrial establishments, Hospital and Nursing Home Authorities, Educational Institutions, Market Complexes and other establishments related to any high risk

buildings should take necessary fire safety measures in conforming to the regulations prescribed under West Bengal Fire Service Act and other relevant Acts and Rules.

- Fire Prevention and Fire Protection is an elementary function of this department. Fire license and Fire Prevention Wing have been established in West Bengal Fire & Emergency Services to undertake the fire prevention and protection work. Fire License wing is responsible for issuing the license for running the business/trade/factories etc. with hazardous/combustible materials. Similarly fire prevention wing is responsible for issuing N.O.C. to high rise and high risk buildings including multiplex and commercial complexes, hospitals, nursing homes, hotels, guest houses and marriage hall/community hall etc.
- This department has also a statutory role in inspection of various buildings, pendals/temporary structures as prescribed under West Bengal Fire services Act.
- Institute of Fire Service, Kolkata a fully modern training centre was built at Behala, Shilpara. This training centre has all latest training facilities with smoke chamber, drill tower and a building for simulation exercise. It can train more than 150 personnel at a time.
- Recently priority has been given on modernization of Fire and emergency service with a modern control room in the state HQ as well as in the divisional HQ with all facilities of modern communication system, recording, analyzing, dispatching, GPS system in Fire Tenders and finding out their locations etc. Fire stations have been provided with mobile sets and walki talkies.
- recently purchased items are 21 no of High and Low Pressure Water Tender, 15 no of Mid size water tender, 30 number of Emergency Tender, 18 no of operational vehicles, 60 motorcycles, Two Hydraulic Platform, (one 54 meter and another 42 meter) for fire fighting and rescue in High Rise buildings, 12 Hydraulics Rescue Tools, 30 nos of circular Saw, Chain Saw, Diamond saw (Cutting and breaking tools), 10 nos of Compressor machine for BA sets, Various types of search and rescue equipments, 3 Towing vehicles, 40 light weight B.A. Sets, Various types of station level equipments like lock cutters, face masks, suction hoses, foam making branches, Insulated Axe, Insulated pliers, Search lights, dividing breaching, hose control clamps, short branch, different types of extinguishers etc, portable pumps.
- Steps are being taken for procuring more numbers of B.A. Sets, Mid size water tender, water bowser, water carrier, portable compressor sets, towing vehicles, water tender with high and low pressure, Hydraulic plat form / T.T.L and various search and rescue equipments, portable pumps etc with the 13th Finance commission Grant.

National Disaster Response Force (NDRF), 2nd Battalion

The Disaster Management Act, 2005 has statutory provisions for constitution of National Disaster Response Force (NDRF) for the purpose of specialized response to natural and man-made disasters. Accordingly, in 2006 NDRF was constituted with 8 Battalions. At present, NDRF has strength of 12 Battalions with each Battalion consisting of 1149 personnel. In the beginning, the personnel of NDRF were deployed for routine law and order duties also. In a meeting of the NDMA with the Prime Minister on October 25, 2007, the need of NDRF being made a dedicated force was highlighted and accepted. This led to the notification of NDRF Rules on February 14th , 2008, making NDRF a dedicated force for disaster response related duties, under the unified command of DG NDRF. The 2nd Battalion of NDRF is located at Haringhata, west Bengal.

Some of the activities of NDRF, which has been performed during massive disaster at Kolkata has been mentioned below:-

- On 09/12/2011 a fire incident accrued at AMRI hospital Kolkata, NDRF got call from state authorities regarding assistance in locating any possible radiation threat from the sensitive radiology department of hospital as well as the medical equipments during fire. Immediately after getting call one CBRN team of 02 Bn NDRF located at Kolkata reached incident site

under the supervision of Sh B.S. Dhar, DC. This team carried out radiation detection operation in every part of hospital. The basement was filled with water, this also could not stop team from conducting radiation detection in basement. After the through radiation detection for around one hour team declayered hospital free from any hazardous radiation.

- On 31st March, 2016 at about 1317 hrs a part of under construction Vivekanand fly over near Girish Park in Kolkata, (WB) was reported collapsed. Many passengers passing under this bridge were reported trapped and a few persons were reported died. On direction of DG NDRF, immediately 02 teams (48 pers) of NDRF already stationed at Rajarhat, Kolkata were rushed to the incident site. These two teams were followed by 8 teams comprising of 352 rescuers from battalion Head Quarter, Haringhata, West Bengal. NDRF teams carried out search and rescue operation with specialized equipment meant for Collapsed Structure Search and Rescue (CSSR) operations i.e. Life Detectors, Air Lifting Bags, Gas Cutter, Chain Saws, Chipping Hammer, Hydraulic Jacks, Angle Cutters, Medical First Aid kits, dogs etc. As priority was to evacuate the live victims, dogs and life detectors were utilized to locate the victims. One doctor, 08 nursing assistants along with other required medical assistance was also deployed to provide first medical response to the victims. Beside these assistance, one technical team comprising of one Assistant Engineer and 08 Junior Engineers was also deployed for providing technical assistance in clearance of debris.
- NDRF also conducts different Mock Exercise. Some of the mock drills, which have been conducted in Kolkata city, have been mentioned in the following table.

Table No.3.2 : Mock exercise conducted by NDRF in Kolkata City

Date	Place	Details
19.11.15	DM Office Alipore, Kolkata (W.B)	Team conducted Mock Exercise on Earthquake Disaster at DM Office Alipore, Kolkata under overall supervision of Major General V K Dutta (Retd), Senior Consultant (CB&ME), NDMA, Sh. P K Bhukta, AC and Disaster Management Department of West Bengal. Personnel of Army, Navy, Air Force, NCC, Civil Defence, Civil volunteers, District Medical team were participated during the Mock Exercise Total = 316 Participants attended..
05.03.16	Shyambazar Metro Rly Station, Kolkata (WB)	Team conducted joint Mock Exercise with Metro Rly Kolkata at Shyambazar Metro Railway Station under over all supervision of Shri. S S Yadav, DC. In which total 14 victim evacuated by this unit Team. During the Exercise Chief Safety Officer – 01, Deputy CHO- 01, Senior Security Officer- 01, Security Comdt. – 01, Asstt Security officer (Fire) – 01, Deputy CHE- 01, Deputy DERF- 01 & 144 RPF Total = 151 pers of railway participated.
03.12.16	Metro Railway Station Sahid Khudiram Bose, Kolkata, (WB)	Team conducted Mock Exercise with Metro Railway Kolkata

3.4 Recommendations

- All existing water bodies and storm water holding ponds need to be protected by strict implementation of existing law. Similarly strict control is essential on further urbanisation on low lying areas. Plinth Levels of all new buildings of Kolkata should be above the highest expected flood level.

- For mitigation of effect of major hazards on housing infrastructure, following measures will have to be taken on urgent basis.

  1. Strict enforcement of the town planning norms amended as per NDMA Guidelines.
  2. Amendment of the existing Building Byelaws as per NDMA Guidelines and proper enforcement of the amended rules for ensuring Construction of new buildings adopting technologies for disaster resistance.
  3. Retrofitting and reconstruction of existing weak and dilapidated buildings respectively. KMC should ensure that retrofitting work must be made mandatory for all weak buildings taking into consideration possible impacts of earthquake and cyclone in this region. KMC should take up retrofitting work for its own buildings under proper engineering supervision and quality control to set example before the common people.
  4. Preparation of an action plan for demolishing the dilapidated buildings in KMC areas is necessary. Moreover the process of identification of other dilapidated buildings and issuing of notice is needs to be intensified.

- Control of spread of slums and informal squatter settlements are necessary. This can be done by rehabilitation of the urban slum dwellers. KMC has already completed two projects of Basic Services for Urban Poor (BSUP). This type of project needs to be done on a large scale to control the spread of slums thus reduce the vulnerable population to hazards.
- Community sensitisation through awareness and training is necessary regarding disaster prevention, mitigation and management, so that they can be used as a resource during disaster. This programme is necessary to perform in every ward especially in the slums.
- The awareness programme and mock drills needs to be organised in schools and colleges by KMC with collaboration of Department of Disaster Management and Civil Defence, Department of Fire and Emergency Services, Kolkata Police and NDRF
- Installation and renewal of fire extinguisher in all schools, shopping mall, residential complexes, markets, office buildings, hospitals etc are very much important. Moreover inspection of the fire safety arrangement on regular basis is mandatory to avoid increasing fire incidents of Kolkata city. Training of the responsible person of the above mentioned places is also essential to operate fire extinguisher to provide primary assistance during disaster.
- KMC may ensure effective city drainage planning, with coordination being required between different departments for the proper drainage of urban/ peri-urban areas.
- The Disaster Management Cell of KMC need a dedicated team for documentation, planning, communication and systematic management of different activities related to disaster.
- KMC may introduce Computerised Technology for Emergency response.
- Inundation map and Evacuation map need to be prepared for each ward of KMC
- Capacity building is necessary for the officials of KMC other stakeholders.
- Other than KMC other Government Department like Transport, KMDA, Irrigation and waterways department need to prepare their own Disaster management Plan and action plan.
- KMC should plan the Environment Management activities following the Roadmap for Low Carbon and Climate Resilient Kolkata.
- Adequate funds shall be provided in every year's budget of Kolkata Municipal Corporation for Awareness Generation, Preparation and Updating of Disaster Management Plans at all (city to ward) levels, Training and Capacity Building, Mitigation Measures, Relief and Rehabilitation. The required funds may be arranged from internal revenues/resources and by approaching the central government / the state government/ confederation of corporate bodies etc.

KOLKATA MUNICIPAL CORPORATION

KOLKATA
MUNICIPAL
CORPORATION

CITY DISASTER MANAGEMENT PLAN OF KOLKATA

VOLUME-2

CITY DISASTER MANAGEMENT PLAN OF KOLKATA

VOLUME – II

First time prepared : 2008
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Updated / Modified : 2018

KOLKATA MUNICIPAL CORPORATION
5, S.N. BANERJEE ROAD, KOLKATA - 13

FOREWORD

The Third UN World Conference on Disaster Risk Reduction (WCDRR) was held in Sendai, Miyagi Prefecture from March 14 to 18, 2015, four years after the Great East Japan Earthquake. Over 100 ministers from 187 UN member states, including 25 heads of state and government, the Secretary-General of the UN, and the Administrator of the United Nations Development Programme (UNDP) participated, making it one of the largest UN conferences ever held in Japan. At the Conference, the Sendai Framework for Disaster Risk Reduction (SFDRR) 2015-2030 was formulated as a new initiative and guideline for disaster risk reduction (DRR). With this, the initiatives of the international community entered a new stage aimed at the further promotion of the mainstreaming of disaster risk reduction.

The Conference and the landmark Framework that emerged out of it was closely followed by two watershed occurrences - Sustainable Development Goals 2015-2030 in September 2015; and Paris Agreement on Climate Change at the 21st Conference of Parties under the United National Framework Convention on Climate Change in December 2015.

The Sendai Framework was the first International Agreement adopted within the context of post-2015 development agenda - while the other two significantly shaped the topology of disaster management plan. The architecture of and city disaster management plan, therefore, further demands an inclusive approach. The first volume of the City Disaster Management Plan provided a framework and direction to the stakeholders for all phases of disaster management cycle.

The second volume in this context has been prepared as a compendium - a ready reckoner for every strata of the administration, concerned authorities, and citizens alike - that will be periodically improved keeping up with the emerging global best practices and knowledge base in disaster management. It is in accordance with the provisions of the Disaster Management Act, 2005, and the established best practices. Every section has been designed to provided adequate and comprehensive information on and for the designated system - not to mention, standard operating procedures.

It will be our unbound pleasure, if this publication invites constructive criticism, suggestions, additional inputs, and new perspectives - not just from the technocrats, academia, social sector, and inter-disciplinary thinkers but citizens, as well - to pave the way for a climate resilient, robust, inclusive, and secure future.

Sovan Chatterjee
Mayor, Kolkata

PREAMBLE

Experiences of disasters world wide have proved that there must be a paradigm shift from relief centric to integrated pre-during-post disaster management approach. Disaster Management, as a bigger perspective, is not merely a programme but a continuous process which helps to make the world sustainable. Disaster Management for a given place includes:

(1) Pre-disaster Mitigation and Preparedness,

(2) Quick and effective Response during disaster with well coordinated effort of all the stake holders,

(3) Post-disaster Relief, Rehabilitation and Recovery activities.

The City Disaster Management Plan (Volume-I) of Kolkata gives a comprehensive idea about the city of Kolkata in the context of disaster management. It also gives some idea about the vulnerabilities and risks of Kolkata city to different major disasters and the Disaster Management (Mitigation) measures adopted for the city. This volume will help the city administration mainly in identifying the areas of Disaster Mitigation and Preparedness programmes and their formulation as well, apart from guiding them in mainstreaming disaster management in all developmental activities. It is not merely a book made once for ever like most other books but it is a friend in need, which should be developed continuously to enhance its effectiveness more and more.

While the City Disaster Management Plan (Volume-II) of Kolkata is a ready reckoner containing the roles and responsibilities, contact details, the pre-determined plan of actions (Standard Operating Procedures) and lists of useable human as well as material resources of most of the major stake holder organizations who are supposed to provide Emergency Supports for Disaster Management in Kolkata city area particularly during and immediately after occurrence of disaster.

The purpose of the Standard Operating Procedure (S.O.P) of a stake holder organization is to delineate responsibilities for emergency management and procedure for the control and coordination of all responses to emergency situation. SOP clearly indicates the action plan, the institutional and coordination mechanism for emergency response mentioning who will do what, when and under whose instruction as well as the sequence of actions to be taken using available material and manpower resources. In the City Disaster Management Plan (Vol. - I) the chapter on Vulnerability and Risk Assessment of the city to various hazards reveals that Kolkata is under the threats of major natural hazards (e.g. Earthquake, Super cyclone, Flood with Storm Surge) that may turn into large scale disasters.

This volume needs to be modified with open mind at regular intervals to include more essential informations which were not available or could not be conceived as necessary during its preparation. Updating of this volume must be made regularly to incorporate all changes in data that happens from time to time. Annual revision of this volume for necessary modification and updating is suggested to make it more and more effective and user friendly.

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DISTRICT DISASTER MANAGEMENT AUTHORITY (DDMA)

The District Disaster Management Authority of Kolkata has been constituted on the 18th January, 2018 with the Municipal Commissioner of Kolkata Municipal Corporation as the Chair Person (ref. following chart). This committee will play major roles for the pre-, during and post disaster activities in the city of Kolkata. This committee will act as the advisory cum final decision making body for management of all kinds of disasters in the city of Kolkata as well as forthe implementation of the preparedness/mitigation projects.

Designation and organisation	Remarks
Commissioner, KMC	Chairperson
Commissioner of Police, Kolkata	Member
Director General (Fire & ES)	Member
Managing Director, WBSTC	Member
Divisional Railway Manager, Sealdah Div.	Member
General Manager, Metro Railway Kolkata	Member
Chief Executive Officer ,KMDA	Member
Project Director, KEIIP	Member
General Officer Commanding, Bengal Area	Member
Chairman, Kolkata Port Trust	Member
Managing Director, CESC Municipal	Member
Executive Engineer, PWD (South Division	Member
Director of Rationing	Member
Superintending Engineer, Irrigation	Member
Chief Municipal Health Officer, KMC	Member
Director General (Civil), KMC	Member
Director General (Water Supply), KMC	Member
Director General (Lighting), KMC	Member
Director General (Roads), KMC	Member
Director General (SWM), KMC	Member
Director General (Building), KMC	Member
Director General (S & D)), KMC	Member
Director General (P & S), KMC	Member
Municipal Secretary, KMC	Member-Convenor

The Municipal Secretary of KMC is the Convener of the DDMA. He is also the Nodal Officer of disaster management in KMC.

LIST OF MEMBERS OF MAYOR -IN-COUNCIL OF KMC (WITH CONTACT NOS.)

Sl.No	Member	Mobile No.	Landline No.
1	**Chair Person of KMC**	98300-09992 94330-97666	2286-1112
2	**Mayor :** (Water-Supply, Assessment- Collection, Finance & Acctts., Personnel, Grievance, Cultural Affairs, KEIP, Licence, Building, Law, P&D, Central Stores, Engineering, PPP and other department not allotted to other members are looked after by Hon'ble Mayor)	98300-56697	2286-1111/ 1211
3	**Dy. Mayor :** (Water Supply to Ships, Amusement, MSDP, Community Hall)	98317-69409	2286-1117
4	**Member Mayor-In-Council :** (Health, Vector Control, Disinfectant Scheme, Construction of Night Shelter, Archives, P&FA (F&SS), Central Medical Stores, MTM TB Hospital)	98305-55111/ 9433020389	2286-1120
5	**Member Mayor-In-Council :** (Solid Waste Management, Tolly'sNullah)	94330-33256/ 98312-88407	2286-1116
6	**Member Mayor-In-Council :** (Parks& Gardens, Sports, Advertisement & Parking)	98300-53524	2286-1114
7	**Member Mayor-In-Council :** (Lighting & Electricity)	98301-51503	2286-1119
8	**Member Mayor-In-Council :** (I&PR, EWS, Printing, IUM, Big-dia.Tube well)	98300-56349	2286-1123
9	**Member Mayor-In-Council :** (Sewerage & Drainage , including [Drainage Pumping Stations], SC [Mechanical] & Man-entry Sewers)	98302-60879/ 93318-60879	2286-1115
10	**Member Mayor-In-Council :** (Health Insurance Scheme, BPL, NSAP, NFBS, NGR)	98311-11089	2286-1122
11	**Member Mayor-In-Council :** (Bustee Development, Environment, & SJSRY)	98303-61410	2252-0280
12	**Member Mayor-In-Council :** (Market)	93391-95010	2286-1118
13	**Member Mayor-In-Council :** (Roads)	98300-44712	2286-1113
14	**Member Mayor-In-Council :** (W.B.U.W.E.S)	98300-13128	2252-0161
15	**Member Mayor-In-Council :** (Education, Kanyashree Prakalpa)	98311-27794	2252-0281

BOROUGH-WISE LIST OF KMC WARD COUNCILLORS
(with Contact Nos.)

BORO. No.	WARD No.	NAME OF COUNCILLOR	CONTACT TELEPHONE NOS.	
			Land	MOBILE
I	Borough Chairman : Sri Tarun Saha		2557-4232	9830023789/9830054789
	1	Smt Sita Jaiswal	2528-4248	9007402438
	2	Smt Puspali Sinha		9836520198/9831338633
	3	Dr. Santanu Sen	64560186	9830144496/9831018395
	4	Sri Goutam Haldar	2546-0100	9433362848/9851529470
	5	Sri Tarun Saha	2557-4232	9830023789/9830054789
	6	Smt Suman Singh	2557-4232/7091	9831201058/9831054044
	7	Sri Bapi Ghosh		9836820675
	8	Sri Partha Mitra		9830034314/9088799918
	9	Smt Mitali Saha	2554-1714	9830610849
II	Borough Chairman : Sri Sadhan Saha		2555-9081	9831868515/9674092931
	10	Smt Karuna Sengupta	2530-1304	9433138330
	11	Sri Atin Ghosh	2286-1120	9830555111/9433020389
	12	Smt Pranati Bhattacharjee	2555-3636	9831839001
	15	Smt Shukla Bhore	2351-9104	9830779622
	16	Sri Sadhan Saha		9831868515/9674092931
	17	Sri Mohan Kumar Gupta		9883013939/9163099922
	18	Smt Sunanda Sarkar	2555-1112	9830671437/9830790439
	19	Smt Sikha Saha	2555-1176	9830409176
	20	Sri Vijay Upadhayay	2218-5836	9830048348
III	Borough Chairman : Sri Aninda Kishore Routh		2362-9955	9830434037/8482003000
	13	Sri Aninda Kishore Routh		9830434037/8482003000
	14	Sri Amal Chakraborty		9831407010
	29	Sri Prakash Kumar Upadhyay	2352-1444	9831063227
	30	Smt Papiya Ghosh (Biswas)		8013602575
	31	Smt Sunanda Guha	2362-9997	9831202081
	32	Sri Santi Ranjan Kundu		9874936391/7044366647
	33	Sri Pabitra Biswas		9433019377
	34	Smt Aokananda Das		9903717200/9231503831/ 9231842932
	35	Sri Ashutosh Das		9830982785/9433012785
IV	Borough Chairperson: Smt Smita Bakshi		2272-2933	9674000740/9733037498/ 9830667498
	21	Smt Sujata saha	2270-9215	9830296206/9051382167

BORO. No.	WARD No.	NAME OF COUNCILLOR	CONTACT TELEPHONE NOS.	
			Land	MOBILE
	22	Smt Meena Devi Purohit	2259-3195	9832116891/9830712297
	23	Sri Vijay Ojha		9903101101/9007300200
	24	Smt Ellora Saha		9831061091
	25	St Smita Bakshi		9674000740/9733037498/ 9830667498
	26	Sri Tarak Nath Chattopadhyay	2530-4032	9830482294
	27	Smt Minakshi Gupta		9830632006/9339493886
	28	Iqbal Ahmed	2351-2815/	9748764758/9831704758 2352-0162
	38	Smt Sadhana Bose	2360-1308	9748076372
	39	Md. Jasimuddin		9674168167
V	Borough Chairperson: Smt Aparajita Dasgupta		2241-3715	9836042431
	36	Sri Rajesh Khanna		9830194564
	37	Smt Soma Chaudhuri		9830083494/9433033494
	40	Smt Swapna Das	2360-5499	9163111811/9432014186/ 94331-65150
	41	Smt Reita Chowdhury	2269-5959	98301-05959
	42	Smt Sunita Jhawar		9830050425/9830231715
	43	Shagufta Parveen		9051083085/9903601118/ 9330891775
	44	Rehana Khatoon		9748695425
	45	Sri Santosh Kumar Pathak	2248-2714	99033-72714
	48	Sri Satyendra Nath Dey		9830052403/9062888193
	49	Smt Aparajita Dasgupta	3260-5333/ 6533-5669	9836042431/9748742431
	50	Smt Mousumi Dey		9143057675/9830843258
VI	Borough Chairperson: Smt Sanchita Mondal		2286-1216	9331063129
	46	Sri Gopal Chandra Saha	4008-2909	9831205849/9143723335
	47	Smt Suman Singh		9748074720/9903880095
	51	Smt Sanchita Mondal	2237-2166	93310-63129
	52	Sri Sandipan Saha	2226-5490/ 2249-9696	8016095745
	53	Smt Indrani Saha Banerjee	2265-6465	9831111089
	54	Amiruddin (Bobby)	4004-5808	9339195010
	55	Sri Arun Kumar Das	2286-5965	9874490579
	60	Kaiser Jamil		9831581136/9836455470
	61	Manzar Iqbal	2217-0490	9830151503/9339521571
	62	Sana Ahmed		9830094780

BORO. No.	WARD No.	NAME OF COUNCILLOR	CONTACT TELEPHONE NOS.	
			Land	MOBILE
VII	Borough Chairman: Sri Jiban Saha		2290-6635	9830041203
	56	Smt Dipali Das	2284-9505	9830448246
	57	Sri Jiban Saha		9830041203
	58	Sri Swapan Samaddar		9830361410
	59	Smt Jaly Bose	2328-0127	7059437792
	63	Smt Susmita Bhattacharya (Chatterjee)	32929897/ 2264-2857	9831118321/8232029897/ 8017339060
	64	Iqbal Ahmed	22297089/ 2286-1117	9831769409
	65	Smt Nibedita Sharma	2343-2647	9831325805
	66	Faiz Ahmed Khan	2234 9956	9830422435
	67	Sri Bijan Lal Mukherjee		9239022479/9674954030
VIII	Borough Chairman: Sri Baiswanor Chatterjee		2465-2860	9831769177
	68	Smt Sudarshana Mukherjee		9830389589
	69	Sri Sukdev Chakraborty	2475-2321	9433072501
	70	Sri Ashim Kumar Bose		9007787742
	72	Sri Sandip Ranjan Bakshi	24753044/ 2474-1737	9831103915/9831195713
	83	Smt Manjusree Majumdar	2455-4830	9831882084
	84	Smt Paromita Chatterjee	2419-2101	9831770655/9830058033
	85	Sri Debasish Kumar	2464-6373	9830053524
	86	Smt Tistha Biswas (Das)		9831993220/983192459
	87	Sri Subrata Ghosh		9831896710/9874627855
	88	Smt Mala Roy	22861112/ 2466-2015	9830009992/9433097666
	90	Sri Baiswanor Chatterjee	24791477/ 2461-2874	9831769177
IX	Borough Chairman: Sri Ratan Malakar		2479-1833	9830620988
	71	Smt Papia Singh		9830094407
	73	Sri Ratan Malakar		9830620988
	74	Smt Debalina Biswas		9830783522
	75	Belquis Begum		9331438295
	76	Sri Sasti Das		9831349803/9748979497
	77	Shamima Rehana Khan		7686954988
	78	Nezamuddin Shams		9831070697/9748735697
	79	Sri Ram Pyare Ram	2439-6729/1500	98300-13128
	80	Md Anwar Khan		9330803838/9903703838
	82	Sri Pranab Biswas	2479-6317	9433451991

BORO. No.	WARD No.	NAME OF COUNCILLOR	CONTACT TELEPHONE NOS.	
			Land	MOBILE
X	Borough Chairman: Sri Tapan Dasgupta		2422-9043	9339722701
	81	Smt Jui Biswas	2299-2909	9088080000
	89	Smt Mamata Majumdar		9830176895
	91	Smt Annapurna Das	2442-1065/2589	9836085937
	92	Smt Madhuchhanda Deb		9433314901/9874113350
	93	Sri Ratan Dey	2286-1113	98300-44712
	94	Smt Archana Sengupta		9831697765/9831733090
	95	Sri Tapan Dasgupta	2413-4760	9339722701
	96	Sri Debabrata Majumder	2412-4252	9831288407/9433033256
	97	Smt Mitali Banerjee		9903920869/9831202556
	98	Sri Mrityunjoy Chakraborty		9836542916
	99	Sri Debasish Mukherjee	2421-8298	9432321210
	100	Smt Susmita Dam	2421-8000	7278788274/7278788263
XI	Borough Chairman: Sri Tarakeswar Chakraborty		2425-8138	9831249249
	103	Smt Nandita Roy		8902550681
	104	Sri Tarakeswar Chakraborty		9831249249
	110	Sri Arup Chakraborty		9830934467/7278510614
	111	Sri Chayan Bhattacharya	2435-1153	9903345432
	112	Smt Anita Kar Majumder		9331958077
	113	Sri Gopal Roy	2431-8888/7676	9433083621/9331048481
	114	Sri Biswajit Mondal		8334881677/9830242277/ 9836094083
XII	Borough Chairman: Sri Sushanta Kumar Ghosh		2418-1875	98301-75740
	101	Sri Bappaditya Dasgupta		9831044455/9831055577
	102	Smt Rinku Naskar		90072-93438
	105	Sri Tarun Mondal		99030-91999
	106	Smt Madhumita Chakraborty		98747-39275
	107	Sri Sushanta Kumar Ghosh		98301-75740
	108	Sri Shyamal Banerjee		98310-07402
	109	Smt Ananya Banerjee		99030-47182
XIII	Borough Chairman: Sri Susanta Ghosh		2397-1102/1053	9830096296/9433084393
	115	Smt Ratna Sur	2402-2726/ 2286-1103	9830943950/8017815169
	116	Smt Krishna Singh	2355-6139/ 3638/2096	9830335988
	117			24037219
	118	Sri Tarak Singh	2286-1115	9830260879/9331860879
	119	Smt Ashoka Mondal		9830428933

BORO. No.	WARD No.	NAME OF COUNCILLOR	CONTACT TELEPHONE NOS.	
			Land	MOBILE
	120	Sri Susanta Ghosh	2397-4363	9830096296/9433084393
	122	Smt Soma Chakraborty		9433956577/9051010055
XIV	Borough Chairman: Sri Maniklal Chatterjee		2397-1102/1053	9830680629
	121	Sri Maniklal Chatterjee		9830680629
	127	Nihar Bhakta		9831930069
	128	Smt Ratna Roy,Majumder	2397-3396	9836929205
	129	Smt Sanhita Das	2407-7610	9836667254
	130	Sri Avijit Mukherjee	2252- 0281	9831127794
	131	Sri Sovan Chatterjee	2286-1111/1211	98300-56697
	132	Smt Sanchita Mitra		9831736391/9836426137
XV	Borough Chairman: Sri Ranajit Shil		2497-6049	9674670255
	133	Sri Ranajit Shil	2469-9313	9674670255/8697660740
	134	Shams Iqbal	2469-9313	9903632837
	135	Akhtari Nijami		9748883337/9331677720
	136	Shamsuzzaman Ansari	2469-2683	98300-56349
	137	Rehmat Alam Anssari	2469-6410	9830042133/9331808614
	138	Begum Tapsira		98741-73555
	139	Aftabuddin Ahmed		9830127451/9051362603
	140	Abu Md. Tarik		9830402585/9143679683
	141	Mamtaj Begam	2469-8540	9836531269
XVI	Borough Chairman: Sri Indrajit Bhattacharya		2467-0057	9433403469
	123	Sri Sudip Polley		9831692625/9830182814
	124	Sri Rajib Kumar Das		9830029450
	125	Sri Ghanasree Bagh		9051529517
	126	Smt Shipra Ghatak		8697670776/9830242696
	142	Sri Raghunath Patra		8697672746/9143009751
	143	Sri Indrajit Bhattacharya		9433403469
	144	Sri Shefali Pramanik(Patra)		9831619054/9831244438

Important Contact Numbers of KMC

Sl.No	Officers	Mobile No	Land No
1	Municipal Commissioner	98300-33355	2286-1234/1034
2	Special Municipal Commissioner (General & Development)	94323-13646	2286-1271
3	Special Municipal Commissioner (Rev.)	98301-58232	2286-1204
4	Municipal Secretary	98366-65845	2286-1265
5	DMC (Store and Supply)	90514-15841	2265-0857

A.1. ESF STRUCTURE OF KOLKATA MUNICIPAL CORPORATION

A.1.1. KMC CONTROL ROOM (2286-1212/1313/1414)

Important Telephone Nos. of Different Control Room

K.M.C. Control Room HQ		2286 -1212 / 1313 / 1414 MOBILE NO. -9830324330
K.M.C. Control Room in Borough Offices (6.00 am to 10.00 pm)	Borough-I	9433112272 / 25574232
	Borough-II	9830620633 / 25559081
	Borough-III	9831518635 / 23629955
	Borough-IV	9874045716 / 22722933
	Borough-V	9830324328 / 22413715
	Borough-VI	9830120243 / 22861216
	Borough-VII	9433899765/ 22906635
	Borough-VIII	9830478904/ 24652860
	Borough-IX	9833531022 / 24791833
	Borough-X	9831349740 / 24229053
	Borough-XI	9433867289 / 24258138
	Borough-XII	9831635931 / 24181857
	Borough-XIII	9830345868 / 23971102
	Borough-XIV	8981881366 / 23971102
	Borough-XV	9830018733 / 24696049
	Borough-XVI	9830365991 / 24670057

Important Telephone Nos. of key officials of the KMC Control Room for Disaster Management (During Monsoon)

Name	Designation	Contact Number
Sri Harihar Prasad Mondal	Municipal Secretary	98366-65845
Sri S L Mukherjee	Add. Secretary	98304-00013
Sri Amit Kumar Roy	D.G. (S&D)	94330-93803
Sri S. Bhowmik	DG (Elec.)	98303-24348
Sri H.S. Roy	S.O. Caretaker Unit	9831582441

A.1.2. PARKS & SQUARES DEPT. of KMC

Important Telephone Nos. of key officials of the KMC Parks & Squares Department

Name	Designation	Contact Number
Sri Debasish Chakraborty	D.G (Parks & Sqaures)	98368-86508
Sri Somenath Sen	Dy.Ch.Engr. (P &S)	98306-02809
Sri Santanu Roy	Dy.C.E. (P&S)	94333-93586
Sri Banibrata Samaddar	E.E.(C)/ P & S	98317-06627

A.1.3. SOLID WASTE MANAGEMENT DEPT. of KMC

Important Telephone Nos. of key officials of the KMC Solid Waste Management Department

Sl. No	Designation	Contact Number
1	D.G.(SWM)	98365-36419
2	O.S.D.(M)/SWM-II	90073-53703
3	Deputy Chief Engineer (SWM - II)	98305-82716
4	Ex.Engr.(C-I)	98306-50331
5	Ex Engr(C - II)	94346-43284
6	Ex Engr(C - IV)	94331-30465
7	Deputy Director- I	98364-85503
8	Deputy Director - II	98313-15171
9	Deputy Director- III	94336-9114
10	Deputy Director- IV	94334-52596
11	Deputy Director- V	94326-52386
12	Deputy Director -VI	99037-39403
13	Assistant Director / Br-I	72780-08989
14	Assistant Director /Br- II	94336-22800
15	Assistant Director /Br-III	86976-48526
16	Assistant Director /Br-IV	98042-16604
17	Assistant Director /Br-V	86370-06714
18	Assistant Director /Br-VI	90075-41469
19	Assistant Director /Br- VII	98836-15213
20	Assistant Director /Br-VIII	75869-34076
21	Assistant Director /Br-IX	98741-48046
22	Assistant Director /Br- X	94329-69085
23	Assistant Director /Br- X	92392-08615
24	Assistant Director /Br-XI	98307-59041
25	Assistant Director /Br- XII	94331-06068
26	Assistant Director /Br-XIII	90516-53844
27	Assistant Director /Br- XIV	98319-62122
28	Assistant Director /Br-XV	89279-54836
29	Assistant Director /Br-XVI	91639-21241
30	Advisor(SWM)	98310-95622
31	Ex.Engr.(M)	94333-86267
32	Ex.Engr.(M)	98305-91330
33	Ex.Engr.(M)	92316-48631
34	Ex.Engr.(M)	97322-08755
35	Garage Incharge-I	94334-59482

Sl. No.	Designation	Contact Number
36	Garage Incharge-II	98304-07392
37	Garage Incharge-III	90882-20632
38	Garage Incharge-IV	99032-80142
39	Garage Incharge-pool	98317-18792
40	Garage Incharge-J.Unit	97324-4264
41	Garage Incharge-Dhapa Unit	86977-23387
42	Garage Incharge- SSU	80170-88789
43	Garage Incharge- GRU	93325-85434
44	Garage Incharge- CWS	98304-73358
45	Sri Subhankar Sahoo, A.E. (C)-IX	9874148046
46	Sri Himadri Sekhar Saha, A.E. (C) -III	8697648526
47	Sri Abu Taher Sekh, A.E. (C)-XV	8927954836
48	Manoj Kumar Murmu, A.E. (C)-V	8637006714

A.1.4. SEWERAGE & DRAINAGE DEPT. of KMC

Important Telephone Nos. of key officials of the KMC Sewerage & Drainage Department

Sl. No.	Designation	Mobile No.	Land No.
1	D.G. (S&D)	94330-93803	2286-1253,2286 1000, Extn2661,Intercom-253
2	DG- Tolly Nullah	98303-24324	
3	Deputy Chief Engineer (Elec.)	94337-26103	
4	Dy. CE(C)/North	99033-35919	
5	Dy.C.E.(C)/Central	90078-38329	
6	Executive Engineer (Dr.)(Central)	94339-91855	2286-100(Ext-2488)
7	Executive Engineer (M) Sewer Cleansing(North)	94747-47033	2528-7755
8	Executive Engineer (M) Sewer Cleansing(Central)	98303-25216	2329-1877
9	Executive Engineer (M) Sewer Cleansing(South)	94324-94320	2401-4464
10	Executive Engineer (Dr.)(North)	94336-25406	2286-100(Ext-2551)
11	Executive Engineer (Dr.)(South)	98303-50338	2286-100(Ext-2554)
12	Executive Engineer(E) (B.D.P.S.)	98742-72283	2344-9142
13	Executive Engineer (M) (D.L.P.S)	94339-23082	2323-5536
14	Executive Engineer (M) (P.B.P.S.)	98301-09712	2425-5000
15	Executive Engineer (E) (M. D. P.S.)	80137-63737	2350-1166
16	Executive Engineer (E) (Kudghat)	98303-11559	

A.1.5. WATER SUPPLY DEPT. of KMC

Important Telephone Nos. of key officials of the KMC Water Supply Department

Sl. No.	Designation	Mobile No.	Land No.
1	Director General (WS)	98303-79939	2286-1239
2	O.S.D(WS)-I	98303-24317	
3	O.S.D(WS)-II	98303-17475	
4	Deputy Chief Engineer(WS)-I	94338-35877	
5	Deputy Chief Engineer(WS)-II	98308-31488	
6	Deputy Chief Engineer(WS)-III	98303-17108	
7	Executive Engineer(WS)-North	86977-08270	
8	Executive Engineer(WS)-Central	98312-72690	
9	Executive Engineer(WS)-South	92315-03929	
10	Executive Engineer(WS) - JU	94324-30786	
11	Executive Engineer(WS)-SSU	98311-62134	
12	Executive Engineer(WS)-GRU	94324-41553	
13	Executive Engineer(WS)-West	98333-12207	
14	Executive Engineer(WS)-Br-IX	86975-61123	
15	Executive Engineer(WS)-Tubewell	98300-81082	
16	Executive Engineer(WS)-IGWTP	92312-12584	
17	Executive Engineer(WS)-TPS	94337-04384	
18	Executive Engineer(WS)-ARSM	94324-20410	
19	Executive Engineer(WS)-WPS&MGPS	98314-56638	

A.1.6. HEALTH DEPT. of KMC

Important Telephone Nos. of key officials of the KMC Health Department

Sl. No.	Designation	Mobile No.	Land No.
1	Chief Municipal Health Officer	98302-41660	2286-1238, Extn-2503
2	Deputy Chief Municipal Health -I	94332-64105	2418-1970
3	Deputy Chief Municipal Health Officer-II& CTO	98300-61346	2286-1240, Extn-2816
4	Deputy Chief Municipal Health Officer III	98300-11041	2286-1238, Extn-2503
5	Deputy Chief Municipal Health Officer IV	97487-39406	2479-1434
6	Nodal Officer(Health)	93397-46178	Extn-2214
7	Special Officer (Health Programme)	98311-67033	Extn-2215
8	Chief Vector Controll Officer	98302-77664	2286-0050
9	MSO	98310-36572	2286-1240, Extn-2816
10	Dy. CMHO-IV/Executive Health Officer -Borough- I	97487-39406	2546-0846
11	Dy. CMHO-VI /Executive Health Officer-Borough - II & N.O.(Ambulance)	98300-62150	2555-9143
12	Executive Health Officer/Br - III	94333-81645	2364-8404
13	Executive Health Officer /Br - IV	98300-22006	2272-4560

Sl. No.	Designation	Mobile No.	Land No.
14	Executive Health Officer /Br - V	98300-53604	2241-4802
15	Executive Health Officer /Br - VI	98300-89545	2286-1043
16	Executive Health Officer/Br - VII	94335-49976	2265-1020
17	Executive Health Officer/Br - VIII	98311-37782	2464-9518
18	Dy. CMHO-I / Executive Health Officer /Br - IX	94332-64105	2479-1434
19	Executive Health Officer /Br - X	98310-87347	2422-6622
20	Executive Health Officer /Br - XI	98302-84729	2435-5968
21	Executive Health Officer /Br - XII	98310-45031	2418-1970
22	Executive Health Officer /Br - XIII	98302-25902	2447-1649
23	Executive Health Officer /Br - XIV	93309-48282	2397-1041
24	Executive Health Officer /Br - XV	98311-63055	2489-3997
25	Executive Health Officer /Br - XVI	91637-84316	
26	Superintendent CMS	98361-54491	2265-7774
27	Ambulance H.Q		22197202/7201

A.1.7. BUILDING DEPT. of KMC

Important Telephone Nos. of key officials of the KMC Building Department

Sl. No.	Designation	Mobile No.	Land No.
1	Director General (Bldg.)	98303-24310	2286-1277(Dir.); 22861000, Extn 2451, Intercom-277
2	Director General (Bldg.) - II	98368-86508	2286-1090(Dir); 22861000, Extn-2891, Intercom-206
3	D.G. (C)/ Building/ South	98361-27236	2286-1214(Dir); 2286100; Extn-2449
4	Deputy Chief Engineer (North)	94332-63585	2286-1214(Dir); 2286100, Extn-2869
5	E. E. (C) - Borough I	98365-42713	2554-1466
6	DY. C. E.(C)/ E. E. (C) - Borough II	94321-04269	
7	E. E. (C) - Borough III	98301-72932	2364-9298
8	DY.C.E (C)/E.E.(C) - Borough IV &V	98310-14687	2219-1772
9	E. E. (C) - Borough VI	92390-23598	2286-1277
10	DY. C.E.(C)/ E. E. (C) - Borough VII	94332-63585	2286-1277
11	E.E.(C) - Borough VIII	98302-36911	2440-1467
12	E. E. (C) - Borough IX	86978-08761	2479-1833
13	E. E. (C) - Borough X	98306-15433	2483-0684/2412-6766
14	E. E.(C) - Borough XI	98302-36911	2425-8136
15	DY. C.E.(C)/ E. E. (C) - Borough XII	94334-74871	2425-8136
16	TECHNICAL ADVISOR (BR-XIII, XIV&XVI)	98311-47898	2416-5914
17	DY.C.E./E. E.(C) Borough XV	94333-93979	2468-1034

A.1.8. CIVIL DEPT. of KMC

Important Telephone Nos. of key officials of the KMC Civil Department

Sl. No.	Designation	Mobile No.	Land No.
1	Director General (Civil)	98303-24329	2286-1249
2	Director General (North)	98361-27236	2286-1249
3	Deputy Chief Engineer (HQ)	99033-35919	2286-1249
4	Deputy Chief Engineer (South)	96742-79805	2286-1249
5	Deputy Chief Engineer (Central)	99033-35919	2286-1249
6	Deputy Chief Engineer (Central- west)	94334-25822	2286-1249
7	Deputy Chief Engineer (C) Br IV	98303-24327	2286-1249
8	Executive Engineer (C) - Borough I	94331-12272	2557-4232
9	Executive Engineer (C) - Borough II	98306-20633	2555-9081
10	Executive Engineer (C) - Borough III	98315-18635	2362-9955
11	Executive Engineer (C) - Borough IV	98740-45716	2272-2933
12	Executive Engineer (C) - Borough V	98303-24328	2241-3715
13	Executive Engineer (C) - Borough VI	98301-20243	2286-1216
14	Executive Engineer (C) - Borough VII	94338-99765	2290-6635
15	Executive Engineer (C) - Borough VIII	98304-78904	2466-6766
16	Executive Engineer (C) - Borough IX	94335-31022	2479-1833
17	Executive Engineer (C) - Borough X	98313-49740	2422-9043
18	Executive Engineer (C) - Borough XI	94338-67289	2425-8138
19	Executive Engineer (C) - Borough XII	98316-35931	2418-0646
20	Executive Engineer (C) - Borough XIII	98303-45868	2468-1034
21	Executive Engineer (C) - Borough XIV	89818-81366	2468-1034
22	Executive Engineer (C) - Borough XV	98300-18733	2469-6049
23	Special Officer (C) - Borough XVI	98303-65991	2467-0057

A.1.9. LIGHTING DEPT. of KMC

Important Telephone Nos. of key officials of the KMC Electrical Department

Sl. No.	Designation	Mobile No.	Land No.
1	Director general (Lighting)	98303-24348	2592-1160
2	Deputy Chief Engineer (Lighting)	98303-24317	
3	Executive Engineer (E)/HQ	98311-77033	
4	Executive Engineer (E)/Zone - I	98308-31808	
5	Executive Engineer (E)/Zone - II	98748-22082	
6	Executive Engineer (E)/Zone - III	94331-06613	
7	Executive Engineer (E)/Zone - IV	94338-99378	
8	Executive Engineer (E)/Zone - V	98306-16541	

Sl. No.	Designation	Mobile No.	Land No.
9	Executive Engineer (E)/Zone - VI	98303-91678	
10	Executive Engineer (Electricity-I)	94337-22131	
11	Executive Engineer (Electricity-II)	97335-16312	
12	Executive Engineer (Electricity)/HQ	96747-06452	
13	Executive Engineer (Electricity)/CMO	92316-12888	

A.1.10. ROADS DEPT. of KMC

Important Telephone Nos. of key officials of the KMC Roads Department

Sl. No.	Designation	Mobile No.	Land No.
1	D. G (Mech /Roads)	94330-91094	2252-2601 Ext-2622
2	D.G (Roads)	98300-43982	2252-2590
3	Deputy Chief Engineer (Civil)	98303-24327	
4	Executive Engineer (C)/North	98312-35711	
5	Deputy Ch. Engineer/Executive Engineer (C)/South	98307-64057	
6	Executive Engineer (M) Palmer Bazar	98304-73358	2329-1538
7	Executive Engineer (M) Goragacha	94334-59482	2401-2245
8	Executive Engineer (M) Roller	94326-70395	2265-9143

A.1.11. DISASTER MANAGEMENT CELL of KMC

Name	Designation	Contact Details
Dr. Mugdha Chakraborty	Disaster Professional	9051312466 (Mob) 033-2252-0153 (Land) mugdhachakraborty85@gmail.com

A.2. ESF STRUCTURE OF WEST BENGAL FIRE & EMERGENCY SERVICES

A.2.1. TOTAL MANPOWER

Total Manpower of the WB Fire & Emergency Services in Kolkata

Station Officer	Sub Officer	Fire Engine Operator-cum-Driver	Leader	Fire Operator
33	41	148	175	303

A.2.2. IMPORTANT TELEPHONE NOS. OF FIRE SERVICES HEAD QUARTER

Directorate Control Room: (033) 2252-1165 / 2222-2225/3227/1173
Emergency Dial - 101

A.2.3. KEY WBF&ES OFFICERS FOR DISASTER MANAGEMENT IN KOLKATA CITY

Hierarchy of WBF&ES officers who will play important roles in Disaster Management

Sl. No.	Name	Designation	Contact Details
1	Shri Jag Mohan, I.P.S.	Director General	D - 2252 - 7172, 2252 - 1165 (through D.G's Control) Extn. - 200, Fax - 2252 - 2223
2	Shri Gour Prasad Ghosh	Principal, Institute of Fire Service.	M - 9433175060. D - 2252-8103, 2252 1165-Extn.258, Fax-2252 8103
6	Shri Tarun Kumar Sinha	Acting Director (Operation) & Divisional Fire Officer South Kolkata Division	M-9434736044, Extn.211
7	Shri Aninda Chakraborty	Acting Director (Fire Prevention) and Divisional Fire Officer - F.P.- I	M- 9339020900
8	Shri Goutam Mukherjee	Divisional Fire Officer - South 24 Parganas District	M- 9830314109
9	Shri Sanat Singha Roy	Chief Instructor, I.F.S. & F.P. - II	M- 9830887396
10	Shri Kamal Kumar Nandy	Divisional Fire Officer - North Kolkata Division	M- 9830334398

A.2.4. OPERATIONAL STAFF STRENGTH (FIRE SERVICE STATION WISE)

Sl. No.	Name of Fire Station	Division	Station Officer	Sub. Officer	Leader	F.E.O.D.	F.O
1	Head Quarter	South kolkata	7	5	32	41	56
2	Kalighat	South kolkata	2	2	8	8	11
3	Tollygunge	South kolkata	1	3	11	7	21
4	Baishnabghata	South kolkata	2	3	9	7	19
5	Gariahat	South kolkata	2	4	13	8	17
6	Alifnagar	South kolkata	2	1	9	4	9
7	Garden Reach	South kolkata	1	1	3	4	9

Sl. No.	Name of Fire Station	Division	Station Officer	Sub. Officer	Leader	F.E.O.D.	F.O
8	Master Da Surya sen	South kolkata	1	2	5	6	15
9	Pragati Maidan	South kolkata	1	2	6	6	13
10	Central avenue	North kolkata	6	4	20	26	38
11	Nimtala	North kolkata	1	1	8	4	11
12	Lalbazar	North kolkata	1	3	7	4	13
13	Writers' Building	North kolkata	0	0	4	0	4
14	Canal west road	North kolkata	2	1	9	9	16
15	Manicktola	North kolkata	2	7	11	7	27
16	Cossipore	North kolkata	1	2	12	7	22
17	Baruipur	South 24 Parganas	0	1	8	6	10
18	Kolkata Leather Complex	South 24 Parganas	0	2	7	3	12
19	Behala	South 24 Parganas	3	5	15	13	22
20	Budge Budge-I	South 24 Parganas	2	2	8	4	13
21	DumDum	South 24 Parganas	1	2	12	3	8
22	Bidhannagar	South 24 Parganas	3	2	11	7	21
23	Baranagar	South 24 Parganas	1	0	12	2	0
24	Madhyamgram	South 24 Parganas	1	2	6	5	11
25	North Barrackpore	South 24 Parganas	0	2	11	7	26
26	Garifa	South 24 Parganas	1	0	9	4	18
27	Kamarhati	South 24 Parganas	1	2	9	6	14
28	Panihati	South 24 Parganas	1	0	9	4	12
29	Barasat	South 24 Parganas	2	2	7	7	13
30	Howrah (R)	Howrah	3	6	15	15	16

A.3. ESF STRUCTURE OF KOLKATA POLICE (INCLUDING TRAFFIC POLICE)

Kolkata Police organization is divided into following Divisions :

- South Division
- Central division
- Port Division
- North and North Suburban Division
- Eastern Suburban Division
- South East Division
- South Suburban Division
- South west Division

Units of Kolkata Police Force:

Kolkata Police is an organization with a complex command structure that reflects the diverse range of tasks it is expected to undertake. The administration of the Kolkata Police Force is vested in the Commissioner of Police.

The members of the Kolkata Police force, under the general supervision of the Commissioner of Police, are attached to one of the following units:

1. Headquarters Force
2. Detective Department
3. Special Branch
4. Enforcement Branch
5. Traffic Police
6. Reserve Force
7. Wireless Branch
8. Security Control Organization
9. Armed Police
10. North and North Suburban Division
11. South Division
12. Eastern Suburban Division
13. Central Division
14. Port Division
15. South east Division
16. South west division
17. Special Task force
18. Combat Battalion
19. Cyber Crime Police Station

The Hierarchy of the staff of Kolkata Police Force is as follows:

- Commissioner of Police
- Special Commissioner of Police
- Additional Commissioner of Police
- Joint Commissioner of Police

- Deputy Commissioner of Police
- Assistant Commissioner of Police
- Inspector/Inspectress of Police/Armed Inspector
- Sub-Inspector/Sub Inspectress/Sergeant/Wireless Suprv/Suvedar
- Assistant Sub-Inspector/Assistant Sub-Inspectress/Armed Assistant Sub-Inspector
- Police driver/constable/Lady Constable/Sepoy
- Head Swore/Swore/Syce
- Wireless Helper

A.3.1. HEADQUARTERS (at Lalbazar) :

Police Control Room in Kolkata : 100 or 2214- 3024/3230

Officials	Name	Phone No.	Email
Commissioner of Police	Shri Rajeev Kumar IPS	2214-5060	cp kolkatapolice.gov.in
Spl Commissioner of Police (I)			splcp1 kolkatapolice.gov.in
Spl Commissioner of Police (II)	Shri Jayanta Kumar Basu IPS	2214-5476	splcp2 kolkatapolice.gov.in
Addl Commissioner of Police (I)	Shri Vineet Kumar Goyal IPS	2214-1696	addlcp1 kolkatapolice.gov.in
Addl Commissioner of Police (II)	Dr R Sivakumar IPS	2214-1515	addlcp2 kolkatapolice.gov.in
Addl Commissioner of Police (III)	Shri Supratim Sarkar IPS	2214-3970	addlcp3 kolkatapolice.gov.in
Addl Commissioner of Police (IV)	Shri K. Jayaraman IPS	2214-5799	addlcp4 kolkatapolice.gov.in
Addl Commissioner of Police (V)	Shri Vishal Garg IPS	2214-5557	addlcp5 kolkatapolice.gov.in
Addl Commissioner of Police (VI)	Shri Satyajit Bandopadhyay IPS	2479-3554	jtcpap kolkatapolice.gov.in
Jt. Commissioner of Police (HQ)	Shri Supratim Sarkar IPS	2214-3970	jtcphq kolkatapolice.gov.in
Jt. Commissioner of Police (TP)	Shri Mitesh Jain IPS	2214-5558	jtcptp kolkatapolice.gov.in
Jt Commissioner of Police (PRB)			jtcpprb kolkatapolice.gov.in
Jt Commissioner of Police (Intel)			jtcpi kolkatapolice.gov.in
Jt Commissioner of Police (Orgn)	Smt. Parul Kush Jain IPS	2214-5509	jtcpo kolkatapolice.gov.in
Jt. Commissioner of Police (A)		2214-1836	jtcpa kolkatapolice.gov.in
Jt Commissioner of Police (AP)	Shri Satyajit Bandopadhyay IPS	2479-3554	jtcpap kolkatapolice.gov.in
Jt. Commissioner of Police (Crime)	Shri Praveen Kumar Tripathi IPS	2214-5737	jtcpcrime kolkatapolice.gov.in
Jt. Commissioner of Police (STF)		2214-5950	jtcpstf kolkatapolice.gov.in
Jt Commissioner of Police (Estab)	Shri Sujay Kumar Chanda IPS	2214-1354	jtcp.estab@kolkatapolice.gov.in
Jt. Commissioner of Police, SB (Security)	Shri Dip Narayan Goswami IPS	2282-0631	dcsbsecurity kolkatapolice.gov.in
Deputy Commissioner of Police (II), Detective Department	Smt. Neeloo Sherpa (Chakraborty) IPS	2214-1516	dcdd2 kolkatapolice.gov.in
Deputy Commissioner of Police (II) Head Quarters			dc.hq2 kolkatapolice.gov.in
Deputy Commissioner of Police, STF	Shri Murli Dhar IPS	2214-1720	dcstf kolkatapolice.gov.in

Officials	Name	Phone No.	Email
Deputy Commissioner of Police (Special), Detective Department	Shri B. V. Chandra Sekhar IPS	2214-1057	dcddspl kolkatapolice.gov.in
Deputy Commissioner of Police(II), Special Branch	Shri Swadhin Kumar Saha	2282-2090	dcsb2 kolkatapolice.gov.in
Deputy Commissioner of Police(III), Special Branch	Shri Ashim Kumar Kar Chowdhury	2282-0031	dc.sb3 kolkatapolice.gov.in
Deputy Commissioner of Police, Wireless Branch	Smt. Joyeeta Bose IPS	2283-7656	dcwb kolkatapolice.gov.in
Deputy Commissioner of Police, Enforcement Branch	Shri. Biswajit Ghosh IPS	2283-7700/ 7800	dceb kolkatapolice.gov.in
Deputy Commissioner of Police, Reserve Force	Shri Saumya Roy IPS	2214-3366	dcrf kolkatapolice.gov.in
Deputy Commissioner of Police(II), Security Control Organisation	Shri Tenzing Bhutia	2287-5881	dcsco2 kolkatapolice.gov.in
Deputy Commissioner of Police, Traffic Department	Shri Sumit Kumar IPS	2214-5403	dctp kolkatapolice.gov.in
Deputy Commissioner of Police (South), Traffic Department	Shri Surya Pratap Yadav, IPS	2499-4703	dctp.south kolkatapolice.gov.in
Deputy Commissioner of Police (II), Traffic Department	Shri Kaustav Chakraborty	2214-5803	dctp2 kolkatapolice.gov.in
Deputy Commissioner of Police (III), Traffic Department	Shri Sisir Kanti Dam	2214-1830	dctp3 kolkatapolice.gov.in
Deputy Commissioner of Police, Home Guard Organisation	Shri Asok Kumar Sarkar	2262-1671/ 1673	dchg kolkatapolice.gov.in
Deputy Commissioner of Police, 1st Bn, KAP	Shri Dinesh Kumar IPS	2409-9054/ 9215	dc1stbnap kolkatapolice.gov.in
Deputy Commissioner of Police, 2nd Bn, KAP		2557-5050	dc2ndbnap kolkatapolice.gov.in
Deputy Commissioner of Police, 3rd Bn, KAP		2409-9096/ 9208	dc3rdbnap kolkatapolice.gov.in
Deputy Commissioner of Police, 4th Bn, KAP		2337-3320	dc4thbnap kolkatapolice.gov.in
Deputy Commissioner of Police, 5th Bn, KAP		2355-9007	dc5thbnap kolkatapolice.gov.in
Deputy Commissioner of Police, 6th Bn, KAP	Shri Baidya Nath Saha	2409-9055	dc6thbnap kolkatapolice.gov.in
Deputy Commissioner of Police, 7th Bn, KAP	Shri Bipul Kumar Dey	2409-9056	dc7thbnap kolkatapolice.gov.in
Deputy Commissioner of Police, 8th Bn, KAP	Shri Amar Nath Chowdhury	2530-0817	dc8thbnap kolkatapolice.gov.in

A.3.2. KOLKATA TRAFFIC POLICE :

Traffic Control Room: 033 2214 - 3644 /033 2242 - 7248/033 2214 - 1476/1475
Toll Free 1073/+91 9830811111/+91 9830010000 Vodafone 2000 & 2001

Officials	Contact Details
Addl. Commissioner of Police (I)	+91 33 2214-1696 addlcp1@kolkatapolice.gov.in
Jt. Commissioner of Police (TP)	+91 33 2214-5558 jtcptp@kolkatapolice.gov.in
Dy. Commissioner of Police (I), Traffic Department	+91 33 2214-5403 dctp@kolkatatrafficpolice.gov.in
Dy. Commissioner of Police (South), Traffic Department	+91 33 24994703 dctp.south@kolkatatrafficpolice.gov.in +91 33 2499-4294 dctp.south@kolkatapolice.gov.in
Dy. Commissioner of Police (II), Traffic Department	+91 33 2214-5803 dctp2@kolkatatrafficpolice.gov.in
Dy. Commissioner of Police (III), Traffic Department	+91 33 2214-1830 dctp3@kolkatatrafficpolice.gov.in
Ac TP I	+91 33 2231-4540
AC TP II	
AC TP III	+91 33 2358-4573
AC TP IV	+91 33 2530-9055
AC TP V	+91 33 2397-5152
AC TP VI	+91 33 2285-0016
AC TP VII	+91 33 2416-9088
AC TP VIII	+91 33 2499-4280
AC TP IX	+91 33 2397-5135
AC TP X	+91 33 2351-0167
AC TP XI	+91 33 2250-5068

A.3.2.1 Other Contact Numbers of Kolkata Traffic Police :

Particulars	Contact Details
Traffic Computer Cell	+91 33 2214-1048/+91 33 2250-5092
Fatal Squad	+91 33 2214-1490/+91 33 2250-5023/+91 33 2250-5225
Howrah Bridge Traffic Guard	hbrtpguard@kolkatatrafficpolice.gov.in +91 33 2262-5068 /+91 33 2262-5018
Shyambazar Traffic Guard	sbrtp.guard@kolkatatrafficpolice.gov.in +91 33 2530-3948/+91 33 2530-0150
Jorabagan Traffic Guard	jbntp.guard@kolkatatrafficpolice.gov.in +91 33 2530-6700/+91 33 2530-0114
Sealdah Traffic Guard	sldtp.guard@kolkatatrafficpolice.gov.in +91 33 2283-7607/+91 33 2283-7543
South Traffic Guard	sthtp.guard@kolkatatrafficpolice.gov.in +91 33 2213-5123/+91 33 2262-4776
East Traffic Guard	esttp.guard@kolkatatrafficpolice.gov.in +91 33 2280-7027/+91 33 2289-0116

Particulars	Contact Details
South-East Traffic Guard	settp.guard@kolkatatrafficpolice.gov.in +91 33 2419-8525/+91 33 2463-5020
Bhowanipore Traffic Guard	bhptp.guard@kolkatatrafficpolice.gov.in +91 33 2409-9117/+91 33 2409-9109
South-West Traffic Guard	swttp.guard@kolkatatrafficpolice.gov.in +91 33 2409-9116/+91 33 2409-9111
Vidyasagar Setu Traffic Guard	vstp.guard@kolkatatrafficpolice.gov.in +91 33 2409-9112/+91 33 2409-4104
Ultadanga Traffic Guard	uldtp.guard@kolkatatrafficpolice.gov.in +91 33 2358-5709/+91 33 2355-5078
Beliaghata Traffic Guard	blgtp.guard@kolkatatrafficpolice.gov.in +91 33 2323-0034/+91 33 2323-2051
Tollygunge Traffic Guard	tgntp.guard@kolkatatrafficpolice.gov.in +91 33 2464-0151/+91 33 2419-6314
Metiabruz Traffic Guard	mtztp.guard@kolkatatrafficpolice.gov.in +91 33 2409-9173/+91 33 2409-9174
James Long Sarani Traffic Guard	jlstp.guard@kolkatatrafficpolice.gov.in +91 33 2397-5018/+91 33 2397-5019
Diamond Harbour Road Traffic Guard	dhrtp.guard@kolkatatrafficpolice.gov.in +91 33 2488-3872/+91 33 2409-8210
Thakurpukur Traffic Guard	tkptp.guard@kolkatatrafficpolice.gov.in +91 33 2407-3838/+91 33 2409-6003
Regent ParkTraffic Guard	rpktp.guard@kolkatatrafficpolice.gov.in +91 33 2499-4701/+91 33 2499-4706
Jadavpur Traffic Guard	jvrtp.guard@kolkatatrafficpolice.gov.in +91 33 2499-1994/+91 33 2499-1995
Garia Traffic Guard	gratp.guard@kolkatatrafficpolice.gov.in +91 33 2462-2080/+91 33 2462-1951
Kasba Traffic Guard	ksbtp.guard@kolkatatrafficpolice.gov.in +91 33 2441-2372
Purba Jadavpur Traffic Guard	pjvtp.guard@kolkatatrafficpolice.gov.in +91 33 2416-5855/+91 33 2416-5696
Tiljala Traffic Guard	tljtp.guard@kolkatatrafficpolice.gov.in +91 33 2285-1505/+91 33 2285-1506
Park Circus Traffic Guard	pcstp.guard@kolkatatrafficpolice.gov.in +91 33 2290-4301/+91 33 2290-4305
Hackney Carriage Branch	+91 33 2409-9025
Statistical Section	+91 33 2250-5095/+91 33 2250-5138
Special Raid Section	+91 33 2250-5378/+91 33 2250-5218
Road Marking Section	+91 33 2286-7337
Law Cell	+91 33 2250-5333
Public Grievance Cell	+91 33 2250-5412
Anti Pollution Cell	+91 33 2409-9137
Traffic Training School	2210-0095

A.3.3. DIVISIONAL DEPUTY COMMISSIONERS OF KOLKATA POLICE:

Division	Contact Details
North and North Suburban Division	2360-5650 • dcnorth@kolkatapolice.gov.in
Central Division	2228-1403/5210 • dccentral@kolkatapolice.gov.in
Eastern Suburban Division	2374-5645 • dcesd@kolkatapolice.gov.in
South Division	2281-4000 • dcsouth@kolkatapolice.gov.in
Port Division	2439-7174 • dcport@kolkatapolice.gov.in
South East Division	2290-4660 • dcsoutheast@kolkatapolice.gov.in
South Suburban Division	2499-4711 • dc.southsubn@kolkatapolice.gov.in
South West Division	2499-4702 • dc.southwest@kolkatapolice.gov.in

A.3.3.1 NORTH & NORTH SUB-URBAN DIVISION:

Divisional Head Office	North and North Suburban Division	Police Stations	Section
Address	113,A.P.C. Roy Road, Kolkata-700009	Shyampukur	A
Phone No	2360-5650	Jorabagan	B
Email ID	dcnorth@kolkatapolice.gov.in	Burtolla	C
		Amherst Street	F
		Chitpur	M1
		Tala	N1
		Sinthi	N2

A.3.3.2 CENTRAL DIVISION:

Divisional Head Office	Central Division	Police Stations	Section
Address	138, S.N. Banerjee Road, Kolkata-700013	Burrabazar	D1
Phone No	2228-1403/5210	Posta	D2
Email ID	dccentral@kolkatapolice.gov.in	Jorasanko	E1
		Girish park	E2
		Hare street	G
		Bowbazar	H
		Muchipara	I
		Taltala	J1
		New market	J2

A.3.3.3 SOUTH DIVISION

Divisional Head Office	South division	Police Stations	Section
Address	34, Park street, Kolkata-700016	Park street	K1
Phone No	2281-4000	Shakespeare sarani	K2
Email ID	dcsouth@kolkatapolice.gov.in	Hestings	L
		Maidan	L2
		Bhawanipur	T1

Divisional Head Office	South division	Police Stations	Section
		Kalighat	T2
		Tollygunge	U1
		Charumarket	U3
		Alipore	V1
		New Alipore	V2
		Chetla	V3

A.3.3.4 EASTERN SUBURBAN DIVISION

Divisional Head Office	Eastern Suburban Division	Police Stations	Section
Address	105,Hem Chandra Naskar Road, Kolkata-700010	Maniktala	O1
Phone No	2374-5645	Ultadanga	02
Email ID	dcesd@kolkatapolice.gov.in	Beliaghata	P1
		Phoolbagan	P2
		Narkeldanga	P3
		Entally	Q1
		Tangra	Q2

A.3.3.5 SOUTH EAST DIVISION

Divisional Head Office	South East division	Police Stations	Section
Address	2, Syed Amir ali Avenue, Kolkata-700017	Ballygunge	S1
Phone No	2290-4660	Gariahat	S2
Email ID	dcsoutheast@kolkatapolice.gov.in	Lake	U2
		Karya	Y
		Beniapukur	R1
		Topsia	R2
		Tiljala	TLJ
		Anandapur	ADP
		Pragati Maidan	PGM

A.3.3.6 PORT DIVISION

Divisional Head Office	Port division	Police Stations	Section
Address	1,Dumayune Avenue, Kolkata-700043	Watgunge	W
Phone No	2439-7174	Gardenreach	X1
Email ID	dcport@kolkatapolice.gov.in	Ekbalpore	Z
		West Port	
		South port	
		North port	
		Metiabruz	MTZ
		Nadial	NDL
		Rajabagan	RJB

A.3.3.7 SOUTH SUBURBAN DIVISION (JADAVPUR DIVISION)

Divisional Head Office	South Suburban Division	Police Stations	Section
Address	255/257, D.P.S. Road Kolkata 700033	Kasba	KSB
Phone No	2499-4711	Garfa	GRF
Email ID	dc.southsubn@kolkatapolice.gov.in	Regent Park	RGP
		Bansdroni	BND
		Purba Jadavpur	PJP
		Panchasayar	PSR
		Survey Park	SVP
		Jadavpur	JDV
		Patuli	PTL
		Netaji Nagar	NGR

A.3.3.8 SOUTH WEST DIVISION (BEHALA DIVISION)

Divisional Head Office	South West Division	Police Stations	Section
Address	255/257, D.P.S. Road Kolkata 700033	Taratala	X2
Phone No	2499-4702	Behala	BHL
Email ID	dc.southwest@kolkatapolice.gov.in	Parnashree	PRS
		Thakurpukur	TKP
		Sarsuna	SNA
		Haridevpur	HDV

A.3.4. LIST OF LOCAL POLICE STATIONS IN KOLKATA CITY AREA:

Division	Police Station	Contact Number
North Division	Shyambazar PS	2555-7585/2533-2100
	Jorabagan PS	2281-4094/2270-0100
	Burtolla PS	2555-7599/2533-6100
	Amherst street PS	2360-5714/2360-5100
	Cossipore PS	2556-6434/2543-2100
	Sinthi PS	2532-5383/2530-0853
	Chitpore PS	2556-6141/2543-4100
	Tala PS	2546-4901/2530-0850
Central Division	Burrabazar PS	2268-7554/2268-0100
	Posta PS	2259-5606/2259-1100
	Jorasanko PS	2269-7279/2218-0100
	Girish Park PS	2219-8041/2219-9100
	Hare Street PS	2211-8760/2215-0100
	Bowbazar PS	2211-4813/2215-5100
	Muchipara PS	2227-8430/2283-7100
	Taltala PS	2227-7784/2284-4100
	New Market PS	2217-7397/2283-6100

Division	Police Station	Contact Number
South Division	Park street PS	2226-8321/2283-2100
	Shakespeare Sarani PS	2281-2541/2281-7100
	Hasting PS	2223-0716/2243-0100
	Maidan PS	2223-2462/2248-0100
	Bhowanipore PS	2455-8092/2454-1100
	Kalighat PS	2454-0177/2455-0100
	Tollygunge PS	2464-2765/2465-4100
	Charu Market PS	2424-9900/2499-1996
	Alipore PS	2479-1021/2408-0100
	New Alipore PS	2400-2943/2409-5100
	Chetla PS	2448-6642/2409-9119
Eastern Suburban Division	Maniktala PS	2360-5681/2360-6100/2360-8126
	Ultadanga PS	2356-6263/2356-6264/2356-6444
	Beliaghata PS	2350-0970 /2363-1100/2363-3358
	Phoolbagan PS	2320-0920/2321-5100/2320-0585
	Narkeldanga PS	2360-5710/2352-0100/2360-8187
	Entally PS	2227-5892/2284-8100/2227-6668
	Tangra PS	2329-6769/ 2283-1100/2329-7565
South East Division	Ballygunge PS	2454-3179 /2454-2100/2475-5931
	Gariahat PS	2486-3702/2486-3703/ 2461-3667
	Lake PS	2429-2353/2409-7100/2429-6294
	Karya PS	2287-1715/2281-1100/2289-3825
	Beniapukur PS	2284-4770 /2284-0100/2286-5999
	Topsia PS	2281-4268/2280-4100/2289-3682
	Tiljala PS	2343-4693 / 2345-2827
	Anandapur PS	2443-5000/2443-8000
	Pragati Maidan PS	2285-0500 / 2285-1507
Port Division	Watgunge PS	2459-3298/2408-2100/2459-8819
	Gardenreach PS	2469-6569/2408-1100/2489-3272
	Ekbalpore PS	2449-2135/2409-9100/2449-4167
	West Port PS	2439-3617/2409-6100/2439-2454
	South port PS	2459-3226/2409-4100/2459-8818
	North port PS	2243-1183/2243-1100/2231-8361
	Metiabruz PS	2469-5317 / 2409-9179
	Nadial PS	2489-4079 / 2409-9172
	Rajabagan PS	2409-9175 / 9176
South Suburban Division (Jadavpur Division)	Kasba PS	2442-0164 / 2441-8500
	Garfa PS	2418-6949 / 2499-1998
	Regent Park PS	2381-3162 / 2311-0592

Division	Police Station	Contact Number
	Bansdroni PS	2410-1022 / 2311-0595
	Purba Jadavpur PS	2426-7345 / 2416-6203
	Panchasayar PS	2432-6001/2432-6011
	Survey Park PS	2416-5686 / 5542
	Jadavpur PS	2473-0146 / 2499-4580
	Patuli PS	2462-5195 / 4122
	Netaji Nagar PS	2421-8056/2421-8057
South west Division (Behala Division)	Taratala PS	2401-1881/2409-2100/2401-2796
	Behala PS	2396-7350 / 2397-5050
	Parnashree PS	2488-7172 / 2409-8212
	Thakurpukur PS	2497-6680 / 2461-6004
	Sarsuna PS	2452-1630/2452-0130
	Haridevpur PS	2403-4040 / 2409-8213

A.3.5. CONTACT DETAILS OF THE KEY OFFICIALS OF DMG, KOLKATA POLICE

Name	Designation	Contact Number	Email Address
Lt. Col. Nevendera Singh	DC Combat Bn	8001200650	
Sri Md. E. Haque	AC, SF (III)	9836064164	
Amitava Chakraborty	OC, DMG	9038648875	ocdmgkp@gmail.com
Dipta Roy	Sergeant	8420039694	ocdmgkp2@gmail.com

A.4. ESF STRUCTURE OF NATIONAL DISASTER RESPONSE FORCE (N.D.R.F)

2 Bn NDRF Unit Control Room: 033-25875032 / 09474061104 / 09474116775

List of Officials and Contact Nos. (2 Bn NDRF - Haringhata Farm, near RRI, P.O-Mohanpur, Nadia)

Name of Officer	Designation	Mobile no.	Office Contact
Shri Nishith Upadhyay	Commandant	9433006015	2526-0179
Shri Swayambar Singh	Dy. Comdt.	9434742866	2526-4394
Shri Abhay Kumar Singh	Dy. Comdt.	8017166655	2526-4394
Shri Vijay Singh	Dy. Comdt.	9434742866	2526-4394

List of Manpower	
Inspector	1
Sub Inspector	3
SI(Engineers)	2
SI/Comn	1
HC(Comm)	1
HC/GD	4
HC/Elect	1
HC/Tech	1
CT/GD	27
HC/Paramedics	2
Vehicle Divers	3
Follower	1
Total	47

Total 18 teams x 47 per team = 846 personnel and 12 teams can be deployed at a time within 02(two) hrs depending upon distance after getting warning order for any disaste

A.5. ESF STRUCTURE OF METRO RAIL, KOLKATA

A.5.1. HIERARCHY OF DEPARTMENTAL OFFICERS WHO WILL TAKE IMPORTANT ROLES IN DISASTER MANAGEMENT IN METRO RAILWAY

Sl. No.	Name	Designation	Phone No.
1	Shri. S. Nath.	PCOM	9007041900
2	Shri. P. Singh.	PCE	9007041200
3	Shri. S.P.S.Chauhan.	PCSTE	9007041800
4	Shri. P.Gupta.	PCEE	9007041300
5	Shri. Dr. M.K. Choudhury	CMS	9007041500
6	Shri. S. Halder	Dy.CSTE(M)	9007041802
7	Shri. U.Saha.	Dy.CEE / RS / NOA	9007041303
8	Shri. B.S.K.Subudhi.	Sr.DEN	9007041202
9	Shri. M.Khan.	Sr.SC/RPF	9007041750
10	Smt. Indrani Banerjee.	CPRO	9007041906

A.5.2. DISASTER MANAGEMENT ORGANIZATION IN METRO RAILWAY, KOLKATA

Chairman & Coordinator : Shri. B.S.K.Subudhi (Sr. DEN) 9007041202
(in absence of V.G. Shamkule, Dy.COM/Safety-9007041903)

Members:	Dy. CSTE (M)	9007041802
	Dy. CEE (RS) NOA	9007041303
	Sr. DEN	9007041202
	Addl.CMS	9007041503
	ASC(Fire)	9007041928

A.5.3. MANPOWER TO MANAGE ANY DISASTER SITUATION

Departments	Manpowers
Traffic Department	PCOM, CTM, Dy.COM/Safety (working as Chairman of Disaster Management Committee), Dy. COM/ Comml, Dy. COM/ P. STM/O, STM/Comml, CTI, TI, CHC, CNL & Staff at Stations
Electrical Department	PCEE, CEE/RS, CEE/Con Dy. CEE /RS/HQ, Dy. CEE/CON/ Spl, Dy. CEE /M, Dy. CEE /RS/NOA, Dy.CEE/P, Dy.CEE/POH/NOA, SEE/M, SEE/Con/RS. AEE/PD/M, AEE/POH.
Signal & Telecommunication Dept	PCSTE, Dy. CSTE/M, Dy. CSTE/Tele, Dy. CSTE/Con-I, SSTE/M, ASTE/M, SE/S&Ts.
Engineering Department	PCE, CE/Con, CE/Con-I, Dy. CE/HQ, Dy. CE/Con-I, Dy. CE/Con-II, Sr. DEN , DEN (O&M), AEN/P. Way AEN (W) MB, AEN (P.W.) TOL-CEN, AEN(P.W) CEN- DMI, AEN(W) TOL-CEN, AEN(W) CEN- DMI.
RPF Department	(a) ASC, Fire - Fire inspector (TOL & NOA). (b) Sr. SC, ASC, IPF (TOL-CEN, CEN-DMI , Metro Bhavan).
Medical Department	CMS, Addl. CMS, Sr. DMO, Sr. DMO-I. DMO, ADMO
Public Relation Department	CPRO, Ch. PI, Photographer

A.6. ESF STRUCTURE OF C.E.S.C. Ltd.

Emergency Contact details of CESC Ltd

Sl. No.	Position details	Contact Nos.	Location
1a	Sr. Control Engineer	033-22368354	Control Room CESC House 1,Chowringhee Square, Kolkata-700001
1b	HT Consumer Desk	033-2225-9156 033-2225-9157	
2	HT Engineers Desk	033-2248-1481/82 033-2248-3107	HT Command Station BBD Bag Substation 34/1, B. B. D. Bag Kolkata-700001
3	LT Engineers Desk	8584820327 9163398839	LT Fault Management Centre, BBD Bag Substation 34/1, B. B. D. Bag Kolkata-700001
4	Call Centre	1912 44031912 18605001912	

A.7. CONTACT DETAILS OF IRRIGATION AND WATERWAYS DEPARTMENT GOVERNMENT OF WEST BENGAL

List of major Drainage Channels within K.M.C area showing officials looking after them

Sl. No.	Name of Drainage Channel	Name and contact details of Assistant Engineer	Name and Contact Details of the Executive Engineer	Name and Contact Details of the Superintending Engineer	Name and Contact Details of the Chief Engineer
1	Town Head -Cut Channel (THC)	Partha Ganguli 8250776623	Kalyan Dey, Ex. Engineer, Calcutta Drainage Outfall Division, Jalasampad Bhawan, Bidhannagar, Kolkata - 91 (9831101505)	Sanjoy Kundu Superintending Engineer, Metropolitan Drainage Circle, Jalasampad Bhawan, Bidhannagar, 9432392987	Debasish Roy, Chief Engineer (South), Jalasampad Bhawan, Bidhannagar, Kolkata- 91 9830452556 Kolkata - 700091.
2	Feeder to Town Head-cut Channel (Feeder to THC)				
3	Suburban Head-cut Channel (SHC)				
4	DWF Channel				
5	Storm Wether Flow Channel (SWF Channel) - 255.00 Ch. to 710.00 Ch.	Subhendu Pal 9883235758			
6	Storm Wether Flow Channel (SWF Channel) - 710.00 Ch.to 1117.00 Ch.	Biswanath Das 9007459565			
7	Dry Wether Flow Channel (DWF Channel) - 710.00 Ch. to 1117.00 Ch.				
8	Upper Bagjola Khal - 0 to 4907 M	Sanjay Mridha 9641821725	Gautam Adikari, Metropolitan Drainage Division No. II,Jalasampad Bhawan, Bidhannagar, Kolkata - 700091 8902471628		
	Upper Bagjola Khal -4907 M to 9235 M.	Sudhamoy Das 9474038095			
9	BB1, CC1 Branch Channels of Intercepting Channel	Samir Majumder 9433469762			
	DD1 Branch Channels of Intercepting Channel	Nilanjan Seal 7980839742			

Sl. No.	Name of Drainage Channel	Name and contact details of Assistant Engineer	Name and Contact Details of the Executive Engineer	Name and Contact Details of the Superintending Engineer	Name and Contact Details of the Chief Engineer
10	EE1 & EE minor	Dinesh Tikadar 9433127679			
11	Intercepting Channel	Samir Majumder 9433469762 Dinesh Tikadar 9433127679 Nilanjan Seal 7980839742			
12	Manikhali Channel System	Angsuman Sarkar 9831185562	Debabrata Sarkar, Ex. Engineer, Metropolitan Drainage Division No.-I, Jalasampad Bhawan, Bidhannagar, Kol- 700091 9830367087		
13	Lower Bagjola Khal - 0 to 28.80 Kms.	Sachikanta Santra 9732288995 Angsuman Sarkar 9831185562 Jyotirmoy Banerjee 9434323577			
14	T.P.Main Khal	Monideep Das 9475552216 7980672080	Ashis Dutta, Ex. Engineer, Urban Drainage Division, Jalasampad Bhawan, Bidhannagar, Kolkata - 91. 8016528381		
15	Suti Khal, Guniagachi Khal & C2C3 Branch Channel				
16	New Monikhali khal (from 1706 m. to 6950 m.) Old Monikhali khal (from 0 to 4998 m.)	Goutam Adhikary 9830770671	Ashes Saha, Ex. Enginer, Suburban Drainage Division, Jalasampad Bhawan, Bidhannagar, Kolkata - 91 9477094832	Subhamay Sarkar Superintending Engineer, Greater Calcutta Drainage Circle, Jalasampad Bhawan, Bidhannagar, Kolkata - 700091 9434604987	Debasish Roy, Chief Engineer (South), Jalasampad Bhawan, Bidhannagar, Kolkata- 700091 9830452556
17	Churial Main khal (from 0 to 17841 m.), Churial Extension khal (from 0 to 2130 m.) & Churial Diversion khal (from 0 to 6942 m.)	Kajal Mondal 9434873807			
18	Tolly's Nullah (from Tentulberia to Bidhyadhari), Keorapukur khal, Western Channel, Renia khal	Santinath Mahanti 9830657524	Jagabandhu Banerjee, Executive Engineer-II, Canals Division, Canal Villa, 9, Galiff Street, Kolkata-700003 9433879282	Jayanta Das, Superintending Engineer, Eastern Circle, Jalasampad Bhawan (8th.floor), Bidhannagar, Kolkata-700091 9007341338	

Sl. No.	Name of Drainage Channel	Name and contact details of Assistant Engineer	Name and Contact Details of the Executive Engineer	Name and Contact Details of the Superintending Engineer	Name and Contact Details of the Chief Engineer
19	Circular khal, Beleghata Circular khal, New Cut khal, Kestopur khal	Amit Banerjee 8017089943	Kousik Mondal, Executive Engineer-I, Canals Division, Canal Villa, 9, Galiff Street, Kolkata-700003 9434368934		
	PUMPING STATIONS				
1	Chowbhaga Old & Additional Pumping Stations	Tarun Patra 9474508561	Sandip Roy, Executive Engineer, Metropolitan Drainage Mechanical Division, Jalasampad Bhawan, Bidhannagar Kolkata-700091 9476155032	Sandip Kumar Dey, Superintending Engineer, Mechanical & Electrical Circle, Jalasampad Bhawan, Bidahnnagar, Kolkata - 700091 9434189497	
2	Keorapukur Pumping Station	Prabir Kumar Das 9433276776			
3	Bagjola Pumping Station	Molla Aksed Ali 9434523239 Biplab Sarkar 9007835737	Sandipan Basu, Ex. Engineer, Metropolitan Electrical Division, Jalasampad Bhawan, Bidhannagar, Kolkata - 700091 9874224648		
4	Monikhali Pumping Station	Molla Aksed Ali 9434523239 Biplab Sarkar 9007835737			

A.8. CONTACT DETAILS OF DIFFERENT OFFICIALS OF GOVERNMENT DEPARTMENTS

A.8.1 Department of Disaster Management and Civil Defence

Control Room: 1070 (Toll free)
2214-3526/ 2253-5185
2214-1378 (Fax)

Sl. No.	Designation	Mobile Number	Land Number
1	Joint Secretary and Nodal officer		2214-3526/22501004

A.8.2 Kolkata Metropolitan Development Authority (KMDA)

Sl. No.	Designation	Mobile Number	Land Number
1	Chief Executive Officer		2358-0019
2	Ch. Engineer, Roads and Bridges Sector		2337-2508
3	Ch. Engineer (Elec. And Mech.)	9163681421	
4	Ch. Engineer (Civil) (Water and Sanitation Sector)	9830762276	

A.8.3 Rail Vikas Nigam Limited (RVNL)

Sl. No.	Designation	Mobile Number	Land Number
1	Chief Project Manager (Garia- Dumdum Metro Project)	9163341532	
2	Chief Project manager (Joka- Dharmatala Metro Project)	9163344001	

A.8.4 P.W.D

Sl. No.	Designation	Mobile Number	Land Number
1	Engineer-in-Chief	9433040182	
2	Chief Engineer (South)	9433060639	
3	E.E. (City Division)	9830045929	
4	Ex. Engineer (Behala Division)	9434667757	

B.1. SOP OF KOLKATA MUNICIPAL CORPORATION

Senior level officers of various departments of KMC have been designated with their responsibilities to tackle any emergency situation arising from heavy monsoon rains (April-November). The actions as outlined are given below:

B.1.1 Parks & Squares Department (Removal/Cutting of uprooted trees from the road-side/slum areas)

- On every single day in the week, there shall be one team (consisting of one Supervisor and five labours with one lorry) placed at each Borough office from 6-00PM to 6-00 AM in Boroughs I to X and one team (consisting of one Supervisor, 4 labours with one lorry from 6-00 PM to 6-00 AM in Borough XI to XVI. Each Supervisor will have a mobile phone. The teams will be centrally controlled by Parks & Squares Dept. in order to facilitate inter-Borough movement, if required. On Sunday & Holidays, there will be round-the-clock arrangements at each borough at the above scale.
- Apart from the above, in the control room, there will be two (2) contractual gangs consisting of one (1) supervisor and four (4) labours from 6.00pm to 6.00am. Each supervisor will have a mobile phone. Team of the Control Room will be directly under the Botanist who will also attend control room every day from 10.00pm. to 6.00am. and round the clock on Sunday & holidays in shifts. Two (2) no of hired lorry will be stationed at central control room every day from 6.00 pm to 6.00 am and round the clock on Sunday & holidays.
- Two hired crane will be stationed at control room from 6.00pm. to 6.00 am for emergency removal of uprooted big trees from any part of the city and one hired vehicle (Tata Sumo type) will be stationed at Control Room from 6.00 pm. to 6.00 am for carrying out emergency inspection and also for immediate attending at the disaster hit site.
- Five(5) Hydraulic Ladders will be stationed during night from 6.00pm to 6.00am.- one (1) at Control Room, One(1) at Tala Park and one(1) at Br.-IX office at 11, Belvedere Road ,one(1) at Br-X office and one(1) at Kurjon park for taking care of any un towards situation at night.
- Mobile phone connectivity will be alive between the different teams for enabling the Control Room to divert from one place to another place.
- D.G. (Parks & Squares), Dy. C.E (P & Sq.)-I, Dy. C.E (P & Sq.)-II, Ex. Engr. of Parks & Squares may be allowed to use hired vehicles during Sundays, holidays and beyond office hours as and when required.
- All the leaves, branches, trunks of the uprooted trees may be removed by Parks & Squares department but branches of trees, leaves etc. etc. from trimming of trees will be removed by SWM deptt. in consultation with the Parks & Squares department.

List of key Officers/ Engineers

Name	Designation	Contact Details
Sri Debasish Chakraborty	D.G (Parks & Sqaures)	98368-86508
Sri Somenath Sen.	Dy.Ch.Engr. (P &S),	98306-02809
Sri Santanu Roy	Dy.C.E. (P&S),	94333-93586
Sri Banibrata Samaddar	E.E.(C)/ P & S	98317-06627
Sri Chanchal Mondal	Asst. Horticulturist	94334-34428

Name	Designation	Contact Details
Sri Sukanta Ghosh	Arboriculture Overseer	98305-61451
Sri Tarun Mondal	Arboriculture Overseer	98311-90035
Sri Susanta Ganguly	Arboriculture Overseer	98366-72159,
Sri Avik Mukherjee	Botanist	98746-14998
Sri Laxikant Murmu	Botanist	97755-80416
Sri Ritam Mondal	Botanist	96810-31894
Sri Subhoprosad Bhattacharya	Botanist	89613-76419

B.1.2 Lighting & Electricity Department (Removal of uprooted lamp posts and tractions)

- In each of the 16 Boroughs there will be one team everyday from 4-00 PM to 8-00 AM in the next morning with each team having one electrician, two helpers, one car and one mobile phone. On Sundays and holidays such arrangements will be there on 24-hour basis.
- On every weekday between 4-00 PM to next day 8-00 A.M, one team will be placed in the Central Control Room. Each team will have one electrician, two helpers, one car and a mobile phone. On Sundays and holidays such services will be made available on 24-hour basis.
- Each night, there shall be an additional special squad available in CMO Building with one generator of 5 KVA fitted vehicle, having one electrician, one helper with one mobile phone and four numbers 250W metal halide lamps in vehicle.

List of key Officers/ Engineers

Name	Designation	Contact Details
Sri Sanjoy Bhowmik	DG(Elec),	98303-24348
Sri D.Das	Dy. C.E. (Ltg.)	98303-21637
Sri Rajib Banerjee	E.E.(Ltg.Zone-I)	98308-31808
Sri Bijan Halder	E.E. (Ltg., Zone-II)	98748-22082
Sri J. Jana	E.E. (Ltg. Zone-III)	94331-06613
Sri Basab Patra	E.E. (Ltg. Zone-IV)	94338-99378
Sri Pintu Das	E.E.(Ltg. Zone-V)	98306-16541
Sri Amitava Roy	E.E.(Ltg. Zone-VI)	98303-91678
Sri Nabarun Sarkar	E.E. (Elec.-I)	94337-22131
Tapas Makal	E.E.(Elec.-II)	97335-16312
Sri Subrata Sinha	Ex.Engr. (Elec.)/HQ	967470-6452

B.1.3 Solid Waste Management Department (Cleaning of gully-pit mouths and other related work)

- To clear the city streets (especially the gully-pits and kerb channels) in the afternoon shifts everyday so that sudden showers cannot clog the city and sub-merge particular areas (Mazdoors are from West Bengal Urban Employment Scheme) upto 6.00 pm.

- Arrangement of five mazdoors along with an overseeing supervisor in each Ward from departmental resources from each Borough/ward in night shift from 6.00 pm to 6.00 am.
- D.G (SWM) will keep one loader, two Lorries, a team of 17 Mazdoors, heads by two supervising staff with mobile phone from 6.00 pm. to 6.00 am daily and from 6.00am to 6.00 pm. + 6.00 pm. to 6.00 am (24hrs) on Sunday & holidays, who will be stationed at SWM (HQ) at 48, Market Street, Kolkata-700 087.

List of key Officers/ Engineers

Name	Designation	Contact Details
Sri Subhasish Chattopadhyay	D.G.(SWM)	98365-36419
Sri S. Mitra,	O.S.D(M)/SWM	9007353703
Sri B. Rakshit	Dy.C.E.(S.W.M.-II)	98305-82716
Sri Sanatan Biswas	Dy. Dir-I (SWM-I)	98364-85503
Sri T. Dhar	Ex. Engineer(C),	94331-30465
Sri T.K. Mukherjee	Special Officer (Special Squard)	98305-25512
Sri Biswanath Naru	Dy. Dir-III(SWM-I)	94333-69114
Sri P.C. Mohanty	Asstt. Dir. /SAS/SWM-1	91635-07914
Sri Joykrishna Dhanuk	S.O./SAS(Special Squard),	72784-84080
T.K Mitra	S.O./SWM-I	9433342821

B.1.4 Drainage Deptt (Deployment of Control Room Management, continuous operation of pumping stations, deployment of mazdoors at water logging pockets, deployment of pumps etc)

- **MANNING OF PUMPING STATIONS**

  There will be round the clock manning in BDPS, PBPS, DLPS, pumping station with at least one A.E. perpetually available in each shift. One Assistant Engineer should be posted at night shift at BDPS, PBPS & DLPS. In case of MDPS, one AE / SAE will be posted round the clock.

- **MANNING AT THE WATERLOGGING POCKETS**

  A. There are three FLOOD CONTROL centres (Hrishikesh Park, Moulali & Traingular park) in Town System & suburban system area. In week days,manning will be done from 11.00 A.M. to 9.00 P.M. in Sunday/ holiday manning will be done from 11.00 am to 4.00 pm & 4.00 pm to 9.00 pm. The programme will be led by at least one SAE.

  B. There is ONE FLOOD CONTROL Centre (Ultadanga syphone pumping Station) in Manicktala system area.There will be manning in flood control area by Contractual Majdoors perpetually available in one shift from 11.00am. to 7.00 pm. under supervision of S & D dept. Arrangement to combat the flood on Central Avenue from Collutola Street to Muktaram Babu Street during the festive season 2 Nos. Gullypit Emptiers, 2 Nos. Jetting-cum-Suction machines will be deployed round-the-clock at the KMC Control Room with required numbers of mazdoors and operators. 2 Nos. 6"pumps and 2 Nos. 4" pumps will be deployed round the clock at the KMC Central Ambulance Garage beside Md. Ali park with required number of mazdoors and operators. Emergent instruments / apparatus arrangements during festive days 2 number of Jetting/ Jetting-cum-Suction machines would be made available at each of

the North, Central and South garages i.e. total of 6 Nos. Jetting-cum-Suction machines with required number of mazdoors and operators will be available.

- **DEPLOYMENT OF PUMPS:**

  Total 71 nos pumps will be deployed at water-logged pockets in Borough-I to Borough-XVI. On June onwards officials of Drainage and Borough will jointly confirm the function of pumps. Borough Ex. Engr. will supervise and monitor the operation of the said pumps till mid of November.

List of key Officers/ Engineers

Name	Designation	Contact Details
Sri Amit Kr. Roy	D.G (Sewerage & Drainage)	94330-93803
Sri Mridul Mondal	Dy. C.E. (Civil)/North	99033-35919
Sri Santanu Ghosh	Dy.CE(C)/Central	90078-38329
Sri Snehasish Samanta	Ex. Engr.Dr. (N)	9433625406
Sri Swapan Chattopadhyay	Ex. Engr (Dr)/C	9433991855
Sri Sandip Das	Dy. C. E. (Elec.)-Pumping Stations	94337-26103
Shri Tapan Sarkar	Ex. Engr(E)/MDPS	80137-63737
Sri Biswajit Bala	Ex. Engr(M)	94339-23082
Sri Kajal Kr Roy	Ex. Engr(E)/BDPS	98742-72283
Sri Supriyo Sengupta	Ex Engr(E)/Kudghat	98303-11559
Sri Biswanath Das	Ex Engr(M)/Palmer Bazar	98301-0972
Sri Bishnu Mondal	Dy. C.E. (M)/S.C. Deptt.	98303-25216
Md. Minhazuddin	Ex Engr (M)/ S.C. Deptt.(North and Central)	9474747033
Sri Partha Pratim Nandi	Ex Engr(M)/ South, S.C. Deptt.	94324-94320

B.1.5 Engineering Department (Deployment of skeleton majdoors at water logging pockets, deployment of potable pumps etc.)

- Skeleton gang comprising of 1 mazdoor per ward from Br. I to X and 1 Drainage Sarkar will be posted at each Borough Office Control Room in two shifts from 6-00 AM to 2-00 PM & 2 P.M. to 10 P.M. on Sundays and holidays along with one Sarkar on each shift. One SAE or AE will be posted on each shift preferably SAE should be posted in the morning shift and AE should be posted in the evening shift in all Boroughs including Joka.
- On weekdays similar arrangements will also be made from 2 P.M. to 10 P.M. at each Borough Office. Mazdoor and Sarkar who will attend office from 2-00 PM to10-00 PM on working days, will remain absent in the morning shift. One AE will stay at Borough Control Room till 10 p.m. on all working days.
- Mazdoor under West Bengal Urban Employment Scheme should be posted at the listed water logging from in two shifts from 8 a.m to 1 p.m. and 1 p.m. to 6 p.m. during the entire monsoon period (from 10th June to 15th November). Borough Executive Engineers will engage the said experienced mazdoors in consultation with Borough Chairman/Chairperson.. The number of mazdoor should be decided by the Bor. Ex. Engr. according to water-logging pockets in consultation with Zonal Dy. Ch. Engineers and DG (Civil). In case of added area i.e. Borough – XI to Borough – XVI, similar

arrangements i.e. mazdoors should be deployed from West Bengal Urban Employment Scheme from 10th June to 15th November.

- In case of suspension of work under West Bengal Urban Employment Scheme, deployment of contractual mazdoors may be engaged at minimum numbers according to priority with prior approval of Municipal Commissioner if situation demand during heavy rain.
- Ex. Engr (C) XI to XVI will arrange to 6 nos of mazdoor for to attend the emergent water logging pocket as and when required from 6 am to 10 pm. from 10th June to 15th November.
- One hired P.R. lorry should be kept at each Borough office 6-00 A.M to 10-00 PM for movement of mazdoors from one water-logging pocket to another water-logging pocket.
- One hired vehicle preferably Jeep/Tata Sumo should also be kept at Borough office 6-00 AM to 10-00 PM for movement of Asst. Engr./SAEs posted at Bor. Office Control Room for supervision of skeleton gang and for other requirement as and when necessary. In case of hired vehicles run by diesel, normal rate as permissible in KMC including overtime will be given. Normally 5 liter diesel will be provided. In case of extraordinary movement during heavy shower, additional fuel will be issued on specific recommendation of Bor. Ex. Engr. with prior approval of DG (C)
- Bor. Ex. Engrs. I to XVI, Zonal Dy. Ch. Engr. (Central, Central-West , North & South) and DG (C) may be allowed to use hired vehicles during Sundays, holidays and beyond office hours as and when required.
- All the mazdoor, Sarkars including mazdoors under West Bengal Urban Employment Scheme contractual mazdoors should attend water-logging pockets with proper dress and identity cards supplied from KMC with red flags and other necessary equipments.
- Deployment of portable pumps – sufficient nos. of portable pumps will be deployed by Borough Executive Engineers according to need basis in consultation with zonal Dy.CE(C)'s & Chairman/ Chair Person of Borough.
- xi. In case of heavy rain at night, Borough Ex. Engr. will arrange to keep the Borough Office open with required number of mazdoors, Sarkars and other overseeing supervisors according to need basis as and when desired by the Authority
- On working of Sundays & holidays if massive rainfall occurs, sufficient gang/additional mazdoor will be deployed and supervising staff.
- Two nos. Flood Control Centre, one at P.C. Connector another one near Akashbani Bhawan should be opened and operated during monsoon period i.e. from 10th June to 15th November. In the said Flood Control Centre 4 nos. mazdoors including another 4 nos. workers under Urban Employment Scheme should be posted from 6 a.m. to 10 p.m. One supervising staff should also be posted at the said centre; one SAE/AE of the said Borough will supervise about the activity, as and when required. 2 nos. pumps should also be kept ready for immediate deployment, round the clock. EE – VII and V will take necessary measure. Zonal Dy.CE will monitor the said Flood Control Centre and will inspect frequently.

List of key Officers/ Engineers

Name	Designation	Contact Details
Sri P. K. Dhua	D.G.(Civil)	98303-24329
Sri Sukanta Das	DG(North)- Br.I,II,&V	9836127236
Sri Mridul Mondal	Dy. C.E.(C) / HQ & Central , Br.III,VII&VIII	99033-35919
Sri M.K. Mondal	Dy.C.E. (C)/ (C-W) Br.VI, IX & XV	94334-25822

Name	Designation	Contact Details
Sri Kamal Sarkar,	Dy. C.E. (C) /South, Br. No- X,XI,XII,XIII, XIV, XVI	96742-79805
Sri Dipankar Pal	Dy.CE(C)/Br-IV	98303-24327
Sri Durjay sarkar	Assistant Ch. Engineer-II	98368-16981
Sri Swapan Karmakar	E.E(C), Br. – I	94331-12272
Tushar Chandra Chowdhury	E.E(C), Br. – II	98306-20633
Himangshu Roychoudhyry	Dy.C.E.(C)/E.E(C), -Br.-II	94330-89409
Sri Kalyan Das	E.E(C)., Br.- III	98315-18635
Sri Debasish Chatterjee	Dy.CE (C)/E.E(C)., Br.-IV	98740-45716
Sri Tushar Kanti Maji	E.E(C)., Br- V	98303-24328
Sri Anup Kumar Saha	E.E(C)., Br.-VI	98301-20243
Sri Jayanta Sarkar	Dy.CE (C)/E.E(C)., Br.-VII	94338-99765
Sri Anindya Kr. Ghosh	Dy.CE (C)/E.E(C) Br.-VIII	98304-78904
Sri Dinabandhu Boral	Dy.C.E.(C)/E.E(C).,Br.-IX	94335-31022
Sri Subhasish Bhattacharya	Dy.CE (C)/E.E(C),.Br.-X	98313-49740
Sri Sunil Kr. Saha	E.E(C), Br.-XI	94338-67289
Sri Pinaki Bhattacharya	Dy.CE (C)/E.E(C), Br.-XII	9831635931
Sri Sanjoy Kr. Mondal	Dy. CE/E.E(C), Br.-XIII	98303-45868
Sri Jagannath Dey	E.E(C)/Br-XIV	89818-81366
Sri Utpal Mistry	E.E(C), Br-XV	98300-18733
Sri Anupam Guha	Ex. Engr(C), Borough XVI	98303-65991

B.1.6 Roads Deepartment

- DG (Roads) will keep necessary arrangements in case of urgent need for road repairing work.
- D.G. (M)/Roads will provide one no. pay loader & 2 Nos. Tipper Trucks along with Driver, Helper as well as one no. SAE (M) will be deployed at Control Room round the clock including Sunday & holidays to report to DG (Parks & Square) & D.G. (Bldg-II)

List of key Officers/ Engineers

Name	Designation	Contact Details
Sri Soumitra Bhattacharya	DG (Roads)	98300-43982
Sri Dipankar Pal	Dy. CE(C)/Roads	98303-24327
Sri Samiran Ghosh	Dy. CE/Ex.Engineer(Roads/South)	98307-64057
Sri Debabrata Das	E.E.(C)/R/N	9831235711
Sri M. Samaddar	Dy.C.E. E(M) &Controlling Officer(EWS)	94331-47668
Sri Animesh Naskar	E.E.(M)/Asphaltum Goragacha	9163122701
Sri Snehamoy Mandal	E.E.(M), Road Roller	9432670395

B.1.7 Building Department (Demolishing of insecure building and negotiation of collapses)

- On every working day from 10-00 PM to 6-00 AM in the next morning, there will be a team in the Control Room from the Building Department with one Asst. Engineer, as head of team, one Sub. Asst. Engr. in the team, two gangs of 10 labourers with one supervisor each along with a lorry and a mobile phone and a high level vehicle and mobile phone with the Asst. Engr. and the Sub. Asst. Engr.
- The same arrangements as above will be available in the Control Room and on Br-IV and Br-IX on round-the-clock basis in three shifts on Sundays and holidays.
- D.G. (SWM) will keep one pay-loader, two Lorries & a team of mazdoors (headed by one supervisor with mobile phone) on every working day from 09.00 PM to 5.00 AM and round the clock basis on Sundays & holidays in the control room.

List of key Officers/ Engineers

Name	Designation	Contact Details
Sri Anindya Karforma	D.G. (Bldg)	9830324310
Sri Debasish Chakraborty	DG (Bldg.-II)	98368-86508
Sri Sukanta Das	D.G(C) (Bldg.-South)	98361-27236
Sri Asok Guha	Dy. C.E. (Building)	94332-63585

B.1.8 Health Department (Ambulance Services, disinfection & supply of medicine)

- Ambulance services will be made available round-the-clock from the under-mentioned Borough offices to carry casualties, if any, to the nearest hospital
  - i. One ambulance at K.M.C. headquarters ;(except holidays when it will be available from Amb. HQs), three ambulances at ambulance head quarters at C.R.Avenue beside Md.Ali Park.
  - ii. One ambulance at Br-XI, one ambulance at Br-XII and one ambulance at joint office of Bor. XIII & XIV.
  - iii. One Ambulance at the Borough XV office and ne Ambulance at the Borough XVI office.
- To meet the emergent situation during heavy shower, necessary disinfection works with bleaching powder will be undertaken jointly with the SWM Department While the SWM Department will look after disinfection of arterial roads, the KMC Health Department will conduct disinfection in slums.
- Central Medical Store will remain open round-the-clock to meet the emergent situation.

List of key Officers/ Engineers

Name	Designation	Contact Details
Dr. Manirul Islam Molla	C.M.H.O.	9302-41660
Dr. Subrata Roychowdhury	Dy.C.M.H.O. III (In-charge of CMS)	98300-11041
Dr. Basudev Mukherjee	Dy. CMHO VI & NO ,(Ambulance), /Ex. H.O.-II	98300-62150
Dr. Manas Som	Suptd. C.M.S	98361-54491

B.1.9 Water Supply Department (Supply of drinking water and disinfection of tube well and stand post.

- Water tanker will be available on 24 x 7 basis from the office 6 Convent Road and Park Circus Booster Pumping Station.
- In case of heavy shower during monsoon sufficient gang will be deployed for disinfection of the stand posts and tube-wells at the water logging pockets.
- Maintenance gang will be available on 24 x7 basis at 6 Convent Road.

List of key Officers/ Engineers

Name	Designation	Contact Details
Sri Bibhas Maity	DG (WS)	98303-79939
Mainak Mukherjee	O.S.D.(W.S.)	98303-17475
Sri Amitava Pal	Dy.C.E.	98316-30682
Sri Kartik Ch. Ghosh	Dy.C.E.(C)	98312-72690
Sri Subrata Mondal	SAE	94330-67220

B.1.10 Municipal Secretary's Department (Manning of KMC Control Room)

- The Control Room will be manned at two levels:
  a) At one level, as usual, there will be three shifts in the Control Room and in each shift there will be one Dy Manager deployed by the Mpl. Secy. and the said Dy. Manager will be designated as O/C, Control Room. It will be the duty of O/C, Control Room to liaise with all other teams of different departments as mentioned above. Chief Manager (P) will allot the Dy. Manager.
  b) At another level, the DG (S&D) will keep at least one Ex. Engr. every night from 10-00 PM to 6-00 AM in Control Room. The said Ex. Engr/Dy.Ch. Engineer comprising of S.C.deptt. Pumping station and drainage deptt. will leave the Control Room in the next morning immediately after reporting his reliever. On Sundays and holidays also he will keep the Ex. Engrs. in three shifts. On working days during the office hours he will keep at least one Asst. Engr./Sub Asst. Engr. in the Control Room.
- As far as the general staff of the Control Room is concerned, they will be doing all the duties relating to the Control Room. But the specific duty of alerting Drainage P.S. will lie on the officer of D.G. (S & D). The Officer-in-Charge of the shift in Control Room will contact any Controlling Officer or any other officer or Borough Control Room as mentioned above, in tying-up the management of emergency and the controlling officer/other officers/Borough Control Room will use the Control Room for dispatch of messages.
- One Officer will be posted at Lal Bazar Control Room during the heavy rainfall days.
- Municipal Secretary's Deptt. will ensure accessibility to the tarpaulins, dry fruits, clothes, D.M. kit etc. and will send to the desired locations as and when required during catastrophe.
- Arrangement for keeping open the various offices of the C.M.O. Buildings.

List of key Officers/ Engineers

Name	Designation	Contact Number
Sri Harihar Prasad Mondal	Municipal Secretary	98366-65845
Sri S L Mukherjee	Add. Secretary	98304-00013
Sri Amit Kumar Roy	D.G. (S&D)	94330-93803
Sri S. Bhowmik	DG (Elec.)	98303-24348
Sri H.S. Roy	S.O. Caretaker Unit	9831582441

B.1.11 KEIIP

- D.G. (Project) KEIIP will arrange to deploy AE/EE/Dy. CE at Bor. XI (Part of 111 to 114), Bor. XIII (Part of 122), XIV (part of 128 to 132) & XVI (part of 123 to 126) during the monsoon period to support officials of Bor. & Drainage department for proper functioning of S & D work under KEIP.

List of key Officers/ Engineers

Name	Designation	Contact Number
Sri, Soumya Ganguly,	D.G. (P) KEIIP	98310-80056
Sri Subhajit Dasgupta (For Bor-XIII,XVI Part)	Dy.CE (C)	98300-60382
Sri Tapas Bose (For Bor-XIII, XVI Part)	S.O.(C)	98300-94276
Sri, Uday Ranjan Saha (For Bor-XIII, XVI Part)	E.E.(C)	94335-52366
Sri Ashutosh Ghosh (For Bor-XIV, XVI Part)	Dy.C.E.(C)	98307-10756
Sri Ashok Roy (For Bor-XIV, XVI Part)	E.E.(C)	72783-18783
Sri Subha pal Chowdhury(For Bor-XIV, XVI Part)	E.E.(C)	98307-44170
Sri Santanu Das (For Bor-XI)	Dy.C.E.(C)	98306-71296
Sri Amitava Mukherjee (For Bor-XI)	E.E.(C)	9026-89703
Sri Samir Baran Das (For Bor-XI)	E.E.(C)	9143573423

B.1.12 Inspection of the Drainage Pumping Station

Following officers of K.M.C. will inspect the Pumping Station, as & when required, till 15/11/2018 to supervise and monitor the pumping station during the monsoon period.

Name of D.G. / Dy.CE	Jurisdiction / Area of work
Bibhas Kumar Maity D.G. (W.S)	Mominpur Dr. P.S., Nimakmahal Dr. P.S., Chetla Lock Dr. P. Stn.
P.K. Dhua, D.G. (Civil)	Southern Avenue Dr. P. Stn.
Amit Kr. Roy, D.G. (S&D)	Ultadanga PS., Slip Road (Durgapur Bridge), Ultadanga Underpass, Ultadanga Syphon, Manicktola Syphon, Murari Pukur P.S., Rajabazar P.S., Manicktala P.S.
Anindya Karforma, D.G. (Bldg.)	Ambedkar Bridge P.S., (A) DWF, (B) SWF ; Chinrighata P.S., BDPS, DLPS, Manicktola Dr. P.S. Gouribari P.S. (KMWSA),Chowl Patty P.S.
Tapas Kr. Mondal, Nodal Officer Tolly's Nullah.	Jodhpur Park Dr. P.S., L.S.3/GAP Ph.-I, L.S.4/GAP Ph.-I, LS.6/GAP Ph. – I, L.S. 7/GAP PH. –I.
Soumya Ganguly, D.G. (Project) /KEIP	Kalighat Dr. P.S., Gokhal Rd. P.S., L.S.9 (Kantapukur PS.), LS – 10 (Majher-hat PS), L.S.2 (Theckary Road)/ GAP Ph – I, LS 3 (Sashi Sekhar Bosse Road)/ GAP Ph.-II, L.S. – 4 (Canal Road) / GAP Ph. – II, CPT Canal P.S. (KEIP)
Soumitra Bhattacharya, D.G. (Rds.)	L.S. 1/Buroshibtola, LS 5/Kudhgat, LS 2/Lames Long Sarani, Canal Rd. Pumping Stn., Sirity (B.L. Saha Rd.), Keorapukur Main P.S.
Debashish Chakraborty, D.G. (Bldg. – II & P&S)	Jingira Bazar Dr. P.S., Sukuntala Park (Node C), Behal Flying Club (KEIP)
Sanjoy Bhowmick, D.G. (Ltg.)	P.S. 1, BAGHAJATIN, PS 2 Jorabridge, PS 3 Rajdanga, PS 4, Nonadanga, Chak Garia (A) DWF (B) SWF, Kasba (A) DWF (B) SWF, Chowbhaga PS, (I&W Dte.)
Mainak Mukherjee DG (ppp)/OSD (WS)	Macus Square P.S, Hrishikesh Park PS (Thanthania) , Jagannath Ghat P.S.

Name of D.G. / Dy.CE	Jurisdiction / Area of work
Biplab Roy, D.G. (Mech) /Roads dept.	PBPS (A) DWF (B) SWF, Kulia Tangra PS, Pagladanga PS, Topsia Point A P.S. (A) DWF (B) SWF.
Debashis Ghosh, D.G. (MPLAD)	Noapara Dr. PS, Bangur PS, Bangur MPS, Dutta Bagan PS, Beerpara PS, Belgachia PS, LS 1(Beside Ratan Babu Ghat) LS 2 (KP Singh Rd.) LS 3 (B.T. Road), Cossipore P.S., Beerpara New P.S. (KEIP)
Subhasish Chottopadhyay, D.G (SWM)	Trenching Ground L.S., Dhanketi khal LS, Kabardanga PS, Kalgachia PS, Podirhati P.S.
Subrata Seal, D.G. (PMU)	Kamdhahori PS (A) DWF (B) SWF, P.S. II Jora Bridge, LS 1A Rathtala (Garia), LS 1B Usha Gate (Rani Nagar Garia) LS 2A (Bansdroni), LS 2B (Kudghat Kali Bari), LS 5 Kudghat, Baishnabgha Patuli PS.

B.1.13 Review meeting

- A coordination meeting in connection with the monsoon activity during the entire monsoon period will be held at Bor. Office on every Wednesday at 2 p.m. Officials of Drainage. P&S, Bldg., SWM, W.S.& Health will attend in the said meeting to review the different matters related with the different department concerned. Mpl. Commissioner will review the outcome of the said meeting on every Saturday at 12 noon
- Similarly, concerned controlling officers will also arrange a meeting at their level with the concerned officials under his control on every Friday at 2 p.m./ 4 P.M. Finally, Mpl. Commr. will review the different problems, solutions related with the monsoon activity including operation of pumping station, uprooted trees, water logging, repairing of roads, supply of relief materials with the concerned controlling officers (Tech. Advisor, CMFA, Mpl. Secretary, D.G. (Civil), D.G. (WS), D.G. (Project) KEIIP, DG (S&D), D.G. (P&S), D.G. (Rds.), DG (M), DG(Elec.), CMHO, will join in the said meeting on every forth night.
- Bor. Ex. Engineers will also join in the meeting through video conference.
- Special. M.C. (G/D) & Jt. M.C. (Rev.) will also review about the monsoon activity from their end.

B.2. SOP OF WEST BENGAL FIRE & EMERGENCY SERVICES DEPARTMENT

1. First arriving unit will size up to situation and given a complete report to the Control Room. If it is determined the size of fire and that a hazardous chemical or material is involved, the Control Room Officer will dispatch the nearest available assistance with Special Appliances.
2. Until proper identification of the product or material has been made, it should be considered toxic and explosive.
3. Member should ANTICIPATE and not delay in calling for assistance as a limited situation can quickly become a major problem if not handled expeditiously. If evacuation is deemed necessary, it should be started immediately, moving those closed to the problem first and working away from the incident.
4. All protective clothing, including breathing apparatus, will be worn in handling these incidents.
5. The fire arriving senior officer will assume command of the operation until properly relived. He will also designate the staging area. Point to be considered in selecting a staging area (A designated location outside the perimeter of the incident. First-aid equipments stand by manpower and velocity, topography and accessibility.
6. The fire ground Commander will coordinate the establishment of a secure perimeter and the control of site access with the Police Commander on the scene and arrange to establish continuous supply of water for fire fighting purpose.
7. Subsequent arriving units will, in the absence of specific instructions, report to the staging area.
8. The second arriving senior officer will assume command of the staging area.
9. Director will be cognizant of available monitoring appliances & equipments and utilize them to best advantage.
10. Use of house streams for fire fighting & cooling should be considered and stretched where indicated.
11. Fire in flammable gases should not be extinguished unless the flow of gas can be stopped.

B.3. SOP OF KOLKATA POLICE

Types of Crises:

i) Explosion

ii) Hostage situation

iii) Any other terrorist violence

iv) Big communal disturbance

v) Major Fire

A. PRIMARY ACTION TO BE TAKEN BY O.C., CONTROL ROOM

- To inform concerned OC/ Divisional DC at once.
- To inform immediately CP / Addl. CP(I) / DC, DC(HQ), DC(SB), DC(DD), DC(TP), All Divisional DCs /All Superiors(DCs SB/DD/TP to act as per crisis management plan of the unit)

1. To divert one RFS and one HRFS to the spot from the nearest point.
2. To inform concerned OCs / Addl. OCs of Police Stations to reach at Entry/Exit points (total 21 points as per list) and ensure checking of vehicles/suspects with the help of existing pickets (guard rail to be fixed at the point).

(Mobile Nos. of all OCs / Addl. OCs of Police Stations are available at the Control Room)

3. To keep 04 (four) Ambulances ready within 5 minutes and to send them to spot at once, if necessary.

(Garage to be informed, Movements to send 2 Constables in each Ambulance for carrying stretchers. Ambulance to be kept in readiness R/C)

4. To send Infrastructural Team (4 constables under the charge of an officer kept in readiness) with Dragon Light, Rope, Loud-hailers Tape and First-Aid Box at the spot without delay.

To be kept available at Control Room:

i) 10 (ten) Dragon Lights

ii) 30 (thirty) Ropes

iii) 4 (four) Loud-hailers

iv) 5 (Five) bundles of barricade tape

v) 6 (Six) Fire-extinguishers

vi) 7(seven) First-Aid Boxes

5. To contact Nodal Officers (already fixed) of different Hospitals over phone to keep a team in readiness at each hospital.
6. To ask the concerned OCs to send two (02) Officers & Six (06) Constables at each such hospital Emergency immediately.
7. To keep 10 (ten) Ambulances ready, if necessary, by contacting agencies as per list. List to be always kept ready with OC Control Room
8. To alert the Security In-charges of the Shopping Malls and to ask them for arranging for proper checking.
9. To contact Security In-charges of all the Vital Installations and to alert them.

10. To keep 2 (two) contingents of RAF, 2 (two) contingents of SAF and 2 (two) contingents of Commando ready within 10 minutes.

    (OC transport, Lalbazar to send vehicles to lift the force as per direction)

11. To inform All OCs to send 3 (three) teams in their respective jurisdictions and man important crossings to start checking within 10 minutes.

12. To send 2 (two) Inspectors, 4 (four) Sub-Inspectors / Sergeants and 30 (thirty) Constables to the spot from N.C.R.

13. To bring 2 (two) DCs, 4 (four) ACs, 6 (six) Inspectors, 15 (fifteen) Sub-Inspectors / Sergeants, 20 (twenty) ASIs from different Units to Control Room, Lalbazar as per direction of DC(HQ).

14. To bring 100 (hundred) Constables (20 Rifles, 40 Lathi, 1-6 Gas, 4 Sec. T/F) from C.P.s Reserve at Lalbazar NCR.

    (To inform AC, Brigade/BRI/BGCR).

B. i) DC (HQ) to reach the Control Room on receipt of information.

ii) DCs (DD/SB/TP) to act as per their Crisis Management plan, on receipt of information

iii) Concerned OC/AC/Divisional DC to reach the spot on receipt of information. They will barricade the crisis spot immediately with ropes/tapes, arrange evacuation as required and make necessary crowd control arrangement.

iv) The other divisional DCs will immediately start moving in their respective areas, check and brief pickets and patrols at their respective Entry/Exit points and other points, manned by the Police Stations on receipt of information.

C. To immediately create a press enclosure. One Nodal Officer, designated by the DC (Headquarters) will brief the press at the venue (Concerned Divisional DC will arrange such enclosure and inform DC, Headquarters).

D. DC, RF/Wireless Branch should send the rescued persons from the spot, using Police/ Public ambulances. (DC Headquarters to ask DC, RF or Wireless, whoever present, to rush to the spot).

E. All officers at Hospitals and Nursing Homes will collect particulars of injured/deceased persons and send the same to the Control Room.

F. Simultaneous dissemination of information regarding the incident to all citizens through SMS/FM Channels.

B.4. SOP OF DMG, KOLKATA POLICE

(A) DMG PLAN

The DMG of Kolkata police over a period of time has evolved a methodology to respond to disaster situation. The outline of the Disaster Risk Reduction plan on receiving first hand information, the under mentioned actions will be initiated:-

(i) PREPARATORY STAGE (0+15 minutes)

The first hand information of disaster is received though various sources and also from control room Lalbazar. The actions taken are as under :>

a) Alert for mobilization sounded for DMG

b) The Nodal Officer and Sub Nodal Officer of Kolkata Police will interact with Jt Secretary Disaster management for update.

c) Ascertaining the precise location of the disaster

d) Collection of vital information regarding topography & demography of the affected area.

e) Advance possible safety measures undertaken by state Government around the affected zone for the safety of the people

f) Other Government & non government stakeholders to be alerted and to remain available for the disaster risk reduction mechanism

g) List of local resources and the detail map of the affected and surrounding areas to be collected.

h) List of local resources such as generators, tractors and cranes and advance action taken to provision them

i) DMG personnel start preparing for move as per instruction

j) Final checking of stores, equipment, accessories, tools

k) Loading of vehicles as per load tables

l) Advance Party with control post vehicle (to be used as ICP) to move

m) Establishing liaison by Senior Officers with Central Force (NDRF & ARMY)

(ii) ACTIVATION STAGE (0+30MINUTES)

a) Situation to be monitored by D.C.P. Combat & S.F

b) Initial information /briefing to the troops on the following points:-

- Place & time of disaster
- Number of people affected
- Total area /distance affected
- Route to the affected area/ medium of communication
- Information about other rescue agencies operating if any
- Nodal officers Contact numbers
- Information about the location of ICP/on site Operation CoordinatioN Centre
- Location of Hospitals en-route
- Initial deployment plan
- Suggestion for the base of operation(out of hot zone.)
- Safety precaution en-route
- Do's & Don'ts
- Cross checking for ensuring confirming readiness
- Obtain information from local P.S/Representative on site
- Order of march

(iii) MOBILIZATION

It will entail :-

a) Operational mobilization within 30 Minutes.
b) Co-ordinate efforts with local P.S.
c) Control/signal centre to update DMG on move.
d) Advance Party officer to guide in.
e) Information sharing and briefing en-route.

(iv) VEHICLES FOR MOBILIZATION

All specialist vehicles will move with troops and equipment during mobilization as per under mentioned details :-

a) C.S.S.R. & M.F.R. equipments carrier
b) High Ground clearance Vehicle (truck)
c) Small Vehicle.
d) Ambulance.
e) Water tanker
f) Vehicle carrying food for responders
g) Mobile Generator Set

(v) OPERATIONAL STAGE (0+3HRS)

It will entail :-

a) Establishing enhanced incident command post
b) Briefings
c) Co- ordination between Task force, single resource, strike team of operational section
d) Information sharing both vertical and horizontal
e) Co-ordination /information sharing between command, operation, planning, logistics & finance

(vi) STAGING AREA

a) Launch pad for troops in designated area
b) Reserves
c) Rest & recoup area
d) Logistics
e) Temporary Medical aid post

(vii) CONTROL ZONES

a) Area designated for troops to work.
b) Initial first aid to victim.
c) Advance party officer briefs DMG party at ICP
d) Some instructions for locals.

(viii) SOME INSTRUCTIONS FOR LOCALS

Some DOs and DON'Ts are :-

a) DOs.

- Stay calm. Allow little time for objects to fall before moving (earth quake scenario)
- Move cautiously and check for unstable objects and hazards above & around.
- Always remember that safety is the first and foremost criteria of a responder while entering in to a hot zone. Check your self for injuries, help injured or trapped victim using proper technique & equipments

- Check for fire and if any have it controlled
- Check your electric and water line which are in use for operation. If any damage suspected turn the switch off
- Check up the reserve of chemical/ toxic/ flame able material spill to avoid chain of un wanted events
- Listen to radio bulletin if possible for any emergency information.
- Make escape route for emergency situation
- Leave marks and message where rescue work carried out successfully or unsuccessfully

b) DON'Ts

- Do not enter partially damaged buildings. Strong aftershock (in case of earth quake) can cause further damage.
- Do not use your mobile phone (if net work functional) to call your relative or friend. Use it only for disaster related purpose.
- Do not use motorcycle / vehicle inside the affected zone.

(ix) OPERATIONAL STAGE 0+12 HRS

It will entail:-

a) Co-ordination with stake holders for necessary assistance for providing Excavators, tractors, bulldozers, & cranes work in progress.

b) Additional forces of Kolkata police to ensure safety security, route opening, safe passage for responders.

c) Additional forces of KP act as reinforcements.

d) Provide MFR with their equipments to function as par plan.

e) Records of recoveries maintained.

f) Rest & relief of troops.

g) Repair and change of equipments

h) Communicate progress of rescue operation.

(x) DEACTIVATION STAGE/WITHDRAWAL PROCESS

a) When state Government confirms no hazards foreseeable and all victims are escued.

b) All clearance taken from respective departments

c) Briefing, de-briefing, feedback points & lesions learnt are discussed with teams for future operation

d) All breakages / loss/ malfunctioning are recorded and addressed.

e) The physical and mental condition of DMG personnel are checked rest and relief planned.

f) DMG to forward feedback and recommend measures for improvements & up gradation.

(B) ROLE OF CONTROL ROOM/INCIDENT COMMAND POST (ICP)

The role of ICP is to act in close ordination with other agencies established near the disaster zone. The objective of the ICP was are as under :-

a) To carry out briefings at all levels to facilitate operations

b) Information sharing both vertical and horizontal

c) Facilitate planning for operational, logistic and finance chiefs

d) Incident command post to ensure the clear lines of authority, supervision and communication in the entire operation in the affected area

e) Will pass tactical instructions which must be clear for each assigned resource with reasonable time frame

f) ICP to be upgraded to facilitate unified command structure having resource of all departments

1.	List of Tree Cutting team with mobile nos.	(APPENDIX- A)
2.	DMG Quick Response Team details	(APPENDIX- B)
3.	List of Equipments	(APPENDIX- C)
4.	Availability Boats	(APPENDIX- D)
5.	Availability Dragon/Search Light	(APPENDIX- E)
6.	Availability of Wrecker and Cranes	(APPENDIX- F)
7.	Availability of Heavy Vehicles/ Jeep	(APPENDIX- G)
8.	Availability of Vehicles	(APPENDIX- H)
9.	Important Telephone Nos. Of Superior Officer of KP, OC & Addl. OC of Police/AllControl Rooms/DMG Officials etc.	(APPENDIX- J)

(APPENDIX - A)

LIST OF THE TREE- CUTTING TEAM OF DMG, KP

OFFICERS

SL.NO	RANK	NAME	POSTING	MOBILE NO
1	SUBEDAR	Amit Kumar Bandyopadhay	7TH BN	9432612326
2	SUBEDAR	Tamal Chandra Saha	3RD BN	9874094242
3	A/ASI	Apurba Baidya	3RD BN	7278917703

SL.NO	ID No	NAME	POSTING	MOBILE NO
1	P0521	Julfikar Mondal	P.D	9153694131
2	P0523	Sanjay Biswas	P.D	9143414906
3	P0525	Surojit Gupti	P.D	8697010183
4	P0526	Haridas Mondal	P.D	7699347558
5	P0527	Partha Purakait	P.D	8016310138
6	P0528	Debasis Naiya	P.D	8926426801
7	P0530	Santosh Ram	P.D	9804743336
8	P0531	Bhajan Mondal	P.D	9647644934
9	P0533	Naba Kumar Das	P.D	9733648562
10	P0535	Sanjay Haldar	P.D	8013570664
11	PO733	Susanta Haldar	P.D	9836135396
12	PO906	Amresh Choudhry	P.D	8981327913
13	NO901	Probir Shil	N.D	9883107212
14	EO253	Raj Mallik	E.S.D	9874482075
15	EO893	Tarun Mukherjee	E.S.D	9932962747
16	EO2799	Aditya Das	E.S.D	9734368557

CIVIC VOLUNTEERS

SL.NO	NAME	POSTING	MOBILE NO
1	AMIT ROY BARMAN	SEALDAH TPG	7278131500
2	DEO KUMAR RAM	SEALDAH TPG	9903023776
3	DIPU MUNDA	EAST TPG	8013165716
4	JOHN.CH. RAHA ROY	SEALDAH TPG	8620884844
5	KASI MANNA	BHOWANIPUR TPG	9831511627
6	MANOJ KUMAR SAMANTA	ULTADANGA TPG	8013063767
7	MD.SHYEEM	SOUTH TPG	9748935079
8	NALU MONDOL	HQ TPG	9748444374
9	PALASH CHAUDHURY	EAST TPG	9748971193
10	PROSENJIT BANNERJEE	SEALDAH TPG	9836434078
11	RAJU ROY	SEALDAH TPG	9062879381
12	SAHADEB MONDOL	EAST TPG	9831668753
13	SANJU BAHADUR CHETTRI	TOLLY GUNJ TPG	8013302728
14	SARFARAZ HUSSAIN	BHOWANIPUR TPG	9883633491
15	SUMAN ROY	BHOWANIPUR TPG	7449715665
16	SUROJIT CHAKRABORTI	D.M.G/P.T.S	9231443603
17	SHYAMAL SARDAR	D.M.G/P.T.S	9836542272
18	SUJAN BANERJEE	D.M.G/P.T.S	8017947737
19	AVISHEK PANDEY	D.M.G/P.T.S	9674173214
20	GOPAL DAS	D.M.G/P.T.S	8981707978
21	SANJIV DAS	D.M.G/P.T.S	9007145649
22	SUSHANTA GHORUI	D.M.G/P.T.S	9038607960
23	DEBNATH SINGH	D.M.G/P.T.S	8981814578
24	UTTAM MONDAL	D.M.G/P.T.S	9775629971
25	GOBINDA PARAMANIK	D.M.G/P.T.S	9333807171

(APPENDIX - B)

DISASTER MANAGEMENT GROUP, KOLKATA POLICE QUICK RESPONSE TEAM (QRT)

Water Wing (1st Team)

Sl. No.	Name	Designation	Role	Phone No
1	Surojit Mondol	Sepoy – 14087	Team Leader	9933495562
2	Jitendra Narjinary	Sepoy – 15019	Alternate Team Leader	9477558340
3	Subhojit Mukherjee	Sepoy – 2408		9836762284
4	Enamul Hoque Sarder	Sepoy – 19767		9007841744
5	Biswanath Sardar	Sepoy – 1167		9007050858
6	Rajkumar Sardar	Sepoy – 1176		9874041851
7	Mintu Pal	Sepoy – 2623		9804964476

DISASTER MANAGEMENT GROUP, KOLKATA POLICE QUICK RESPONSE TEAM (QRT)

Water Wing (2nd Team)

Sl. No.	Name	Designation	Role	Phone No
1	Sukhdhan Roy	Sepoy – 15123	Team Leader	8017831173
2	Dibakar Roy	Sepoy – 16511	Alternate Team Leader	9163900615
3	Kanai Lal Singha	Sepoy – 17613		9775500598
4	Ranjit Hazra	Sepoy – 975		8116984144
5	Ram Krishna Kayal	Sepoy – 1019		9143076725
6	Dilip Das	Sepoy – 1433		9231900686
7	Rajib Debnath	Sepoy – 2533		8609018714

DISASTER MANAGEMENT GROUP, KOLKATA POLICE QUICK RESPONSE TEAM (QRT)

Water Wing (3rd Team)

Sl. No.	Name	Designation	Role	Phone No
1		Sepoy – 15150	Team Leader	9836424320
2	Dulal Sarkar	Sepoy – 1245	Team Leader	8100699360
3	Subodh Ch. Roy	Sepoy – 16995		7551805441
4	Laltu Kr. Nandy	Sepoy – 19678		8906238845
5	Bijoy Bir	Sepoy – 824		8013073531
6	Afjal Hossain	Sepoy – 1158		9432803818
7	Bablu Roy	Sepoy – 1062		9432803811

DISASTER MANAGEMENT GROUP, KOLKATA POLICE QUICK RESPONSE TEAM (QRT)

C.S.S.R.(1st Team)

Sl. No.	Name	Designation	Role	Phone No
1	Bhola Tiwari	Sepoy – 1711	Team Leader	8013948521
2	Roger Phippon	Sepoy – 17507	AlternateTeam Leader	9674318743
3	Subodh Ch. Barman	Sepoy – 874		9477119926
4	Kali Shankar Ghosh	Sepoy – 1087		9804927094
5	Manik Layek	Sepoy – 1739		9830964911
6	Krishnanu Maity	Sepoy – 2477		8585042766
7	Michal Bramha	Sepoy – 2710		9932251982

DISASTER MANAGEMENT GROUP, KOLKATA POLICE QUICK RESPONSE TEAM (QRT)

C.S.S.R.(2nd Team)

Sl. No.	Name	Designation	Role	Phone No
1	Pallab Haldar	Sepoy – 18868	Team Leader	9143669014
2	Manas Mohanty	Sepoy – 771	AlternateTeam Leader	9433409327
3	Sajal Roy	Sepoy – 1248		8420312610
4	Abu Zafar Molla	Sepoy – 1624		9836070223
5	Nihar Kanti Biswas	Sepoy –2627		9831868500
6	Nayan Chakraborty	Sepoy – 2839		9734031858
7	Som Narayan Dan	Sepoy – 3163		9830138642

DISASTER MANAGEMENT GROUP, KOLKATA POLICE QUICK RESPONSE TEAM (QRT)

C.S.S.R.(3rd Team)

Sl. No.	Name	Designation	Role	Phone No
1	Krishna Pada Mudi	Sepoy – 18054	Team Leader	9831654339
2	Sumon Chatterjee	Sepoy – 18244	AlternateTeam Leader	8016790476
3	Samir Bhowmick	Sepoy – 19859		9564780755
4	Bishal Rai	Sepoy – 04		9051628112
5	Raju Giri	Sepoy –92		7059373710
6	Sk. Anwar Hossain	Sepoy – 1767		8481012170
7	Sk. Ziaul Kerim	Sepoy – 2394		9874433387

DISASTER MANAGEMENT GROUP, KOLKATA POLICE QUICK RESPONSE TEAM (QRT)

C.S.S.R.(4th Team)

Sl. No.	Name	Designation	Role	Phone No
1	Kamal Chowdhury	Sepoy – 16925	Team Leader	9836992116
2	Kartick Ch. Mondol	Sepoy – 411	AlternateTeam Leader	9433884164
3	Dhirendra Pratap Singh	Sepoy – 952		9804492936
4	Satyajit Chowdhury	Sepoy – 1093		9163757725
5	Sentu Roy	Sepoy –1334		9681224741
6	Md. Dilwar Hossain	Sepoy – 1969		9007730491
7	Basudeb Dutta	Sepoy – 1985		9163387624

(APPENDIX - C)

LIST OF EQUIPMENTS

Sl. No	Name of the Equipment	Quantity Held	Employability
1	Air Compressor Machine	11	Water Wing
2	Air Pipe	1100mtr	Water Wing
3	Axe	30	Cssr Wing
4	Ascension L/R	8 pairs	Cssr Wing
5	Aluminum Folding ladder rounded bar step	4	Cssr Wing
6	Anti Tear Gas Mask (with NBC Canister)	10	Cssr Wing
7	Anti Mosquito Fogging Machine-SR-420	2	Cssr Wing
8	Under Water Communication Device	1	Water Wing
9	Bullet Chain Saw	40	Cssr Wing
10	Belt Bag (Waist Pouch)	74	Cssr Wing
11	BP Culf	5	Cssr Wing
12	B.P.Checking Machine "Digital"	3	Cssr Wing
13	Bulky Dressing	5	Cssr Wing
14	Band Aid	100	Both
15	BV Mask	10	Cssr Wing
16	Back Pack	34	Cssr Wing
17	B.A.Set	14	Cssr Wing
18	B.A.Set - Under Water	9	Water Wing

Sl. No	Name of the Equipment	Quantity Held	Employability
19	Battery -12 Volt, 13 Plate	2	Cssr Wing
20	B. Level Suit	10	Cssr Wing
21	Chisel	30	Cssr Wing
22	Chipping Hammer	5	Cssr Wing
23	Cotton Bandage	20	Cssr Wing
24	Cotton Big Spool	20	Cssr Wing
25	Come Along	5	Cssr Wing
26	Chopper	60	Cssr Wing
27	Carabiner	144	Cssr Wing
28	Chain for Telescopic Pole Pruner	9	Cssr Wing
29	CPR Mask	5	Cssr Wing
30	Cervial Collar (small)	10	Cssr Wing
31	Crowbar	10	Cssr Wing
32	Commando Search Light	91	Both
33	Chain for Bullet Chain Saw	140	Cssr Wing
34	Circular Saw - Blade - Metal cutting - STIHL (Abrasive)	51	Cssr Wing
35	Circular Saw - Blade – Concrete - STIHL	8	Cssr Wing
36	Circular Saw - Blade Metal cutting -MAKITA	35	Cssr Wing
37	Circular Blade -Concrete Cutting -MAKITA	7	Cssr Wing
38	Diving Mask	23	Water Wing
39	Diving Suit	25	Water Wing
40	Diver's Gloves & Boots	22 pair	Water Wing
41	Diving Harness	3	Water Wing
42	Diving Suit – DRY	2	Water Wing
43	Diving Overall	6	Water Wing
44	Drill machine - Elecric- Model - FD10SB	10	Cssr Wing
45	Disposable mask	1880	Cssr Wing
46	Double Pully	8	Cssr Wing
47	Diamond Chain Saw - ICS (for wall cutting)	3	Cssr Wing
48	Danger Tape with stand	2	Cssr Wing
49	Dyanamic Rope Beal -11mm-100mtr	4	Cssr Wing
50	Diving Harness for divers	2	Water Wing
51	Diving Tool Kit	1	Water Wing
52	Electric Coil Board	5	Both
53	Ear Plug	60	Cssr Wing
54	Eye Protector	130	Cssr Wing
55	Expansion Bolt	600	Cssr Wing
56	Electric Tool Kit	13	Both
57	Fiber Stretcher	5	Both
58	Full Face Mask (Gas) compitable to charcoal canister	30	Cssr Wing
59	First Stage Regulator C/W HP (for Divers)	2	Water Wing

Sl. No	Name of the Equipment	Quantity Held	Employability
60	First Aid Box	6	Both
61	Foot Pump	4	Water Wing
62	Boat (Fiber)	2	Water Wing
63	FIN - Flipper (4 - pair)	6 pair	Water Wing
64	Fire Rescue Helmet	37	Cssr Wing
65	Fire Extinguisher ABC Type	4	Cssr Wing
66	Full Body Harness - UEE	32	Cssr Wing
67	Fall Protection Harness - UEE - 284	18	Cssr Wing
68	Foot tape for Ascender	32	Cssr Wing
69	Fall Arrest (Retractable)	6	Cssr Wing
70	Figure of Eight	12	Cssr Wing
71	Fire Boot & Gloves	32	Cssr Wing
72	Fire Mask	25	Cssr Wing
73	Filing Kit of Chain	59	Cssr Wing
74	Fire Entry Suit -with BA Set	1	Cssr Wing
75	Fall Arrest Mesh Safety Net	3	Cssr Wing
76	Fire Proximity Suit	25	Cssr Wing
77	Generator (Portable)	5	Both
78	Gum Boots (Fire)	50 pair	Cssr Wing
79	Gas Cutter	3	Cssr Wing
80	Gum Boot - Normal	74	Both
81	Gloves - Industrial	74 pair	Cssr Wing
82	Gloves - Rappelling	50pair	Cssr Wing
83	Gri Gri (Cinch)	20	Cssr Wing
84	Gas Detector	1	Cssr Wing
85	Gas mask (old)	50	Cssr Wing
86	Gloves - Latex - non sterlite (in pairs)	1500	Cssr Wing
87	Gaity	18	Cssr Wing
88	Hood Head Cover	4	Cssr Wing
89	Head Torch	25	Cssr Wing
90	Hand Driven Saw (6' - 30, 4' - 30)	60	Cssr Wing
91	Hammer	30	Cssr Wing
92	Helmet Light	74	Cssr Wing
93	Helmet	124	Cssr Wing
94	Helmet with light (LED)	50	Cssr Wing
95	Head Torch Tikka Plus	35	Cssr Wing
96	Hauling Kit	3	Cssr Wing
97	High Visibility Apparels	795	Cssr Wing
98	High Power Battery Drill Machine	6	Cssr Wing
99	Hanger	620	Cssr Wing
100	Halogene lamp,with telescopic stand & wire	10	Both
101	Hydraulic Cutter & Spreader	1	Cssr Wing
102	Inflatable (Rubber boat)	4	Water Wing

Sl. No	Name of the Equipment	Quantity Held	Employability
103	Inflatable Tower Light	13	Both
104	Iodine Antiseptic Lotion	10	Both
105	Knife - Underwater	12	Water Wing
106	Knife - Spatha	34	Both
107	Kernamental Rope -10mm-200mtr	4	Cssr Wing
108	Kit Bag -Full (medical)	5	Cssr Wing
109	Key Hole Saw	5	Cssr Wing
110	Knee Pad special type	30pair	Cssr Wing
111	Life Jacket	120	Water Wing
112	Life Bouy	24	Water Wing
113	Lead Weight -1Kg - 5,2Kg-5	10	Water Wing
114	Lead Weight With Belt	9	Water Wing
115	Loud Hailor	5	Both
116	Loud Hailor - Megaphone	20	Both
117	Medical Pain Killer Spray	10	Both
118	Medical Item-Thermometer (Digital)	6	Both
119	Medical Items-Trauma Scissor	5	Both
120	Medical Items - Tongue Depressor	5	Both
121	Medical Items-Triangular Bandage	25	Both
122	Nylon Rope	25	Both
123	Nylon Net	11	Both
124	NRB Mask - Large - Medical Items	10	Cssr Wing
125	Nasal Canula	5	Cssr Wing
126	Neosprin Gel - 80 ml	10	Both
127	OBM	2	Water Wing
128	Oars	4 pair	Water Wing
129	Overall jacket	239	Both
130	Orphangiel Airways	5	Both
131	Occlusive Bandage	5	Cssr Wing
132	ORS Pack	30 pkt	Both
133	Plumbing- 50 ltr-CW	2	Cssr Wing
134	Padded Board - Medium	5	Cssr Wing
135	Pen Torch	15	Cssr Wing
136	Paper Cup	105	Both
137	Portable Shelter -14 feet - 10'x14'x7'	6	Both
138	Power Ascender - PQ-500	2	Cssr Wing
139	Pneumatic Air pressure Lifting Bag	1	Cssr Wing
140	Plastic Water Drum - 100ltr	10	Both
141	Pixes	10	Cssr Wing
142	Pully Fixe	8	Cssr Wing

Sl. No	Name of the Equipment	Quantity Held	Employability
143	Quick Draws	23	Cssr Wing
144	Reverso tuber	7	Cssr Wing
145	Rappeling Mittel - Gloves	20pair	Cssr Wing
146	R.R.Saw – STIHL & MAKITA	14	Cssr Wing
147	R.R.Saw - Electric	5	Cssr Wing
148	Reciprocating Saw	5	Cssr Wing
149	Rotary Hammer Drill	5	Cssr Wing
150	Rappeling Static rope -10.5mm - 200m	104	Cssr Wing
151	Rope Protector	25	Cssr Wing
152	Rope Bag & Pack	12	Cssr Wing
153	Rope Throwing Gun - Model-PQ630	2	Cssr Wing
154	Rope Throwing Gun Stand	1	Cssr Wing
155	Spade	11	Cssr Wing
156	Safety Vest Half Jacket	30	Both
157	Safety Goggles	30	Cssr Wing
158	Scene tape Roll - 100m	5	Both
159	SDS Drill Bit	20	Cssr Wing
160	Search Camera Victim Location Unit	1	Cssr Wing
161	Stethoscope	5	Both
162	Stop - Descender Stop	20	Cssr Wing
163	Synflex Jumper Hose	4	Cssr Wing
164	Shovel	10	Cssr Wing
165	Speed Boat with OBM-60HP- Merlyn	1	Water Wing
166	Telescopic Pole Pruner	2	Cssr Wing
167	Tripod With Winch -rescue victim from wells	2	Cssr Wing
168	Thermal Imaging Camera - model-P-7150	1	Cssr Wing
169	Under water Torch	12	Water Wing
170	Weight – 10 & 20Kg	2	Water Wing
171	Water gel blanket	9	Cssr Wing
172	Generator - 5KVA -EV - 65	1	Both
173	Generator - 10KVA	2	BOTH

(APPENDIX - D)

AVAILIBILITY OF BOATS

Sl. No.	Items	No. of Boats	Location	Contact Person	Telephone No.
1	Rubber Boats – 03 Fibre Boats - 01	4	P.T.S	O/C - DMG Amitava Chakraborty	9038648875
				Sgt. Dipta Roy	8420039694

(APPENDIX -E)

AVAILABILITY OF DRAGON / SEARCH LIGHT

Dragon / Search Light:- 17 (Working)

Sl. No.	Make / Supplier	Battery Capacity	Lamp	Inducted in DMG	Status
1	KAISER Arihant Enterprises	12- Volt 7 - Amp	Halogen Lamp	11-06-2009	Useable – 7
2	ULTIMATE Lalit Hardware Stores	12- Volt 7.2 - Amp	Halogen Lamp	23-07-2012	Useable – 4
3	ASKA Lalit Hardware Stores	6 - Volt 3.5 - Amp	LED Lamp	23-07-2012	Useable – 6

(APPENDIX -F)

AVAILABILITY OF WRECKER AND CRANES

Name of the Equipment	Quantity	Capacity	Remarks
Wrecker	Nil		
Cranes	2	12 Ton Mobile Crane 9 Ton Mobile Crane	Serviceable

(APPENDIX -G)

AVAILABILITY OF HEAVY VEHICLES/JEEP

Sl. No	Type of Vehicle	Number of Vehicle
1	Truck (Heavy Vehicles)	2
2	Tata Sumo (Jeep)	3

(APPENDIX -H)

AVAILABILITY OF VEHICLES

Type of Vehicle	Quantity	Make	Remarks
Bus	2	TATA – 909 TATA - 709	Modified for CSSR Wing For Water Wing use
Truck	3	TATA – 1112 – EX - TURBO	01 – Generator fitted 02 – Used during exigency (under disposition of MTO, SF)
Water Tanker	3	TATA – 709 SWARAJ MAZDA	For Water Supply Use during exigency (under disposition of MTO, SF)
Light Truck	1	TATA - 407	For CSSR Wing
Light Vehicle	5	TATA – SUMO TAVERA	04 – Used during exigency (under disposition of MTO, SF) 01 – TAVERA (Under disposition of - I/C-DMG)

(APPENDIX -J)

Important Telephone Numbers of Superior Officers & DMG Officials

Sl. No.	Name / Designation	Phone No.
1	**Sri Supratim Sarkar,** IPS Addl. CP (III)	2214 – 3970
2	**Sri Hari Kishore Kusumakar,** IPS Addl CP (IV)	2214 - 5799
3	**Sri Satyajit Bandopadhyay,** IPS Addl CP (VI)	2479 - 3554
4	**Lt. Col. Nevendera Singh Paul** DC Combat Bn/ Training (SAF)	2262 – 5222
5	**Sri Md. E. Haque** AC, SF	2262 - 1509
6	**Amitava Chakraborty** O/C, DMG	2262 - 3627
7	**Dipta Roy** Sgt - DMG	8420039694
8	**Amit Kumar Bandyopadhay** Subedar	9432612326
9	**Tamal Chandra Saha** Subedar	9874094242
10	**Apurba Baidya** A/ASI - 8885	7278917703
11	**Nilendu Prasad Chaudhury** A/ASI - 13194	9433213427
12	**Harun Al- Rashid** A/ASI - 13904	8336020087
13	**Apurba Kumar Nandy** ASI - 13759	9432846352
14	**Paritosh Adhikary** ASI - 15082	76860 01465

FIELD OFFICES

Sl. No.	Location	Postal Address	Phone / Fax
1	Police Training School	Disaster Management Group Office Police Training School 247, A.J.C, Bose Road Kolkata - 700027	Ph - 033-22623627 Fax -033-22483808
2	Control Room, Lalbazar Kolkata Police	18, Lalbazar Street Kolkata - 700001	Ph - 033-22143230 Fax -033-22145512

B.5. SOP OF METRO RAIL, KOLKATA

B.5.1. Fires in Stations, Tunnels & Metro Railway Trains

Fire in Metro Railway can take place at various locations adversely affecting the system in different ways. The reasons may be unforeseen or anticipated. Fires in station area, underground tunnel viaducts and in trains can cause acute distress to passengers and require prompt disaster management to bring the situation under control.

Fire can be due to electrical short circuit in cables, wires or in electrical equipment. It can be due to failure of cable joints in the tunnel or due to failure of the cable itself. In Metro Coaches it can be due to short circuit faults. Fires can also be due to sabotage including bomb blasts.

B.5.1.1. Fire at Metro Station Premises

The fire can be at the following locations:

In areas where the passengers enter for purchasing tickets or leave the station after performing their train journey including staircases (and escalators, where provided).

For underground stations this area includes the ground surface entries/exits. It also includes the escalators connecting the surface Mezzanine, and the Mezzanine floor level except for Park Street station which does not have a mezzanine level. For Dum Dum Junction it is the ground surface area where Metro tickets are sold and where the passengers disperse including the staircases/escalators connecting the ground surface areas to the platform areas. For Tollyganj ground surface station it is the areas in the station prior to the entry of passengers on to the Up platform and includes the subway leading from the ticketing area to the Up platform. It also includes the area adjacent to the Down platform after the exit gates.

The service rooms and the installations housing the ventilation and air-conditioning equipment including the station air intake/exhaust locations which are situated on the ground surface or mezzanine level and are approachable through these areas.

In platform areas, including the service rooms and installations housing the ventilation and air conditioning equipment, station air intake/exhaust locations, which are situated at the platform level and are approachable from the platform. This also includes cases of fire within the station limits in the tunnel/ viaduct/portion of track surface. Auxiliary electrical substations situated at platform level.

In case of fire in areas where passengers enter/leave the station premises the endeavour of station staff should be to cordon of the area so that it is not approachable by intending Metro users or by Metro passengers leaving the station area.

(a) Duties of the Station Master / Station Superintendent at the adjacent station

Inform the Central Control about the fire and also appraise the requirement of medical assistance, if necessary. Close the station entry and exit from the platform near the fire location, to prevent access to the area by persons not connected with the salvage. Announce through Public Address system to passengers to get out of the platform and use the other mezzanine or other entries for entry and exit. In some underground stations there are areas which, if affected by fire, would block all the exits from the stations. In such cases the passengers should be requested to be on the platform and board the next available train for detraining. Inform fire personnel for fighting the fire. Use fire extinguishers available at the station with the help of other staff and try to extinguish the fire. Switch off intake fans by pressing the push buttons provided for the purpose in Station Master's room. Where push buttons are not provided, advise the ventilation staff at the station to switch off intake fans and ensure that exhaust fans are running. Advice Electrical staff to cut off power supply to the affected area.

(b) Duties of the Traffic Controller

(i) After receipt of the report of fire, Traffic Control should inform the Fire Brigade personnel and the Medical Team for fire fighting and medical assistance (if required).

(ii) Regulate the Train service, as required. If the fire is at a station in an area blocking all exits from the mezzanine, the driving Motorman of trains approaching the station should be advised to inform his passengers that they should not detrain at the affected station. The doors of the coaches would however be opened to take the waiting passengers from the platform.

(iii) After clearing the passengers available on the platform the Traffic Controller should inform the Traction Power Controller to take necessary precautions about electrical equipment available at the station and regulate the ventilation system as required, depending upon the situation of the fire.

(c) Duties of the Traction Power Controller

(i) He should advise Electrical staff at the station to stop intake fans in the portion of the station where the fire has broken out. Advice the staff concerned to fight the fire with the available fire fighting equipment with them.

(ii) Operate the ventilation system after the fire is extinguished to disperse smoke from the place of fire.

B.5.1.2. Fire in Platform Areas

The endeavour of the station staff should be to prevent access of persons on to the platform and to disperse the existing passengers from the platform.

(a) Duties of Station Master/Station Superintendent of the station

(i) He should inform the Traffic Control immediately about the fire so that train services can be suitably regulated if the fire is likely to affect the running of trains.

(ii) Suspend selling of tickets and announce through Public Address system to passengers not to get on to the platform.

(iii) Guide the passengers to go out of the station till such time the fire is extinguished and normalcy is restored.

(iv) To advise the ventilation staff at the station to close the ventilation system so that fire is not further aggravated. Exhaust fans, however, should be kept working.

(v) Fight the fire with the help of available station staff with the available fire fighting equipment.

(b) Duties of Traffic Controller

(i) The Controller should regulate the train services depending on the situation on either side of the affected station.

(ii) Make announcement on the train and other stations (through Motormen and the Station Masters) about the incident giving reasons for the regulation of train services.

(iii) In case the fire does not affect running of the trains, the passenger on the platform of the affected station can be taken to the next station by running the train services and announcement should be made to that affect.

(iv) To inform the fire fighting personnel and Medical Team for assistance depending on the gravity of the situation.

(v) Fire Brigade personnel of the state Govt. may also be informed for assistance.

B.5.1.3. Fire in the Tunnel / Viaduct / Track Surface Outside Station

This covers the areas along the Metro track inside the tunnel, over viaducts and on surface. It also includes the mid-point shafts which can be approached through the tunnel including the sump areas. In cases of

fires in the areas mentioned above, the incident should be immediately reported to the Traffic Controller by the person who locates the fire.

(a) Duties of Traffic Controller

(i) On getting information of fire in the tunnel, train service should be regulated and trains should be stopped at the stations on either side of the location of the fire.

(ii) Passengers at the stations on either side as well as on trains should be informed on Public Address system, through Motormen and Station Masters, about the incident. If necessary, they should be asked to vacate the train and get out of the Metro system.

(iii) The fire fighting personnel should be informed for fighting the fire.

(iv) Traction Power Controller should be informed about the situation for taking necessary steps in respect of switching off of power supply equipments, as required.

(v) Ventilation system should be regulated by informing the stations on either side to close the intake air so that there is no airflow to the fire through intake shafts. The exhaust fans should, however, be kept working for eviction of smoke.

(b) Duties of Traction Power Controller

(i) In case of fire in tunnel, due to cable failure or cable joint failure, necessary switching operation should be done to isolate the faulty section immediately and to restore power supply through alternate sources so that lighting and traction system power can be maintained.

(ii) Inform the Ventilation staff and other Power supply staff concerned to take necessary steps for identifying the fire and fighting the fire with the equipments available with them.

(iii) Ventilation staff at the stations at either end of the fire should be asked to stop the intake fans and run only the exhaust fans.

(c) Duties of Motormen

(i) In case of fire in the tunnel, the Driving Motorman will observe the fire to assess whether he can run the train in the affected area and take his train to the next station, if possible, or stop the train short of the fire in case it is not possible to go to the next station.

(ii) When the train is stopped at the mid-section due to fire in the tunnel, he should immediately inform his rear Motorman about the incident and ask him to get prepared for evacuation of passengers through the rear of the train.

(iii) He should inform the Central Control through Train Radio system and ask for switching off the power.

(iv) The Controller, on receipt of such information, will inform TPC and get the power switched off. The TPC will exchange Private Number with the Motorman after switching off power, as required, for detrainment of passengers. Thereafter, detrainment of passengers will be undertaken by the two Motormen.

B.5.1.4. FIRE IN TRAIN

(a) Duties of Motormen

(i) In case of fire in train detected by passengers and made known to the Motorman on any of the sides or noticed by the Motorman of either side, first attempt should be to take the train, if

it is in motion, to the next station without stopping it in mid-section. In case the train is unable to move due to the fire within the train, immediate action should be taken for evacuation of passengers from either end as per the procedure laid down for detrainment of passengers.

(ii) If it is possible to move the train to the next station, then on reaching the station, the doors should be opened and announcement should be made to all the passengers to evacuate the train immediately and get out of the station at the earliest.

(iii) The Motorman should inform the Traffic Control through Train Radio System asking for necessary evacuation of passengers from the station at the quickest possible time.

(iv) He should also ask the Traffic Control for necessary medical assistance, if necessary, at the station which he is approaching.

(b) Duties of Traffic Controller

(i) In case of fire in train, the Traffic Controller should inform the fire fighting personnel as well as the Medical Team for rushing to the station where the train has stopped, or on the stations on either side if the train has stopped in mid-section for necessary assistance.

(ii) In case of train stopping at the mid-section, he should inform the TPC to switch off the third rail power on both sides for quick evacuation of passengers.

(iii) He should control all train services on both the lines.

(iv) He should inform Ventilation staff for stopping intake fans and run only the exhaust fans.

(v) He should inform Station Master / Station Supdt. of station on either side and arrange for announcements over Public Address system to waiting passengers and also to guide detrained passengers to safety.

(c) Duties of Traction Power Controller

(i) He should switch off traction power in case of stoppage of train in mid-section due to fire in train.

(ii) If the power is likely to affect the high tension cable, laid on tunnel walls, he should switch off the power of the particular feeders; but ensure lighting in tunnel through alternate supply.

(iii) He should contact the TLC and exchange Private Number stating the power has been switched off and evacuation of passengers can be started as laid down in the procedure for evacuation of passengers.

(iv) He should inform Ventilation staff at the station on either side to take necessary action for stopping the intake fans and running only the exhaust fans.

(v) He will co-ordinate with concerned Section Engineer / Works & Section Engineer (Elec. Pump) to ensure availability of water by running all concerned pumps for fire fighting purpose.

(d) Duties of Inspection Protection Force, Metro Bhavan

(i) He will co-ordinate from Control with the available SIPF/ASI on spot, obtain details of fire and ask for necessary assistance from State Police / Fire Brigade.

(ii) He will coordinate with Traction Power Controller to ensure proper running of water pumps and availability of water in fire hydrants.

B.5.2. FLOODING OF METRO TUNNEL

When the water level inside the tunnel rises above the drain top the situation is termed as Flooding. When this water level touches the 3rd rail, it causes short circuit of the 3rd rail power supply resulting in power interruption and stoppage of train services. It is therefore, necessary that commuter services be stopped before the water level touches the bottom of the 3rd rail. The major causes for flooding of Metro Tunnel leading to stoppage of train services are as follows :

(i) Entry of flood water through station entry or other entries due to excessive flooding in the city.

(ii) Excessive leakage from the tunnel walls and roofs at various locations.

(iii) Non-working of sump pumps due to power failure or due to defective pumps etc.

(iv) Breakage of water pipelines inside the tunnel.

(v) Breakage or choking of drains leading to sumps resulting in water accumulation on track. Any one of the above reasons can cause water level to rise inside the tunnel and result in interruption of train services due to water touching the 3rd rail and causing short circuit.

B.5.2.1. ACTIONS TO BE TAKEN FOR TACKLING THE DISASTER

The following actions are warranted when flooding occurs:

(i) Control of trains including the affected train in order to isolate the flood affected zone.

(ii) Detrainment of passengers if trains stop either at platform or in the section due to flooding.

(iii) To keep the passengers informed of the situation through the train and station PA systems.

B.5.2.2. PERSONS TO GET INVOLVED IN TACKLING THE DISASTER

i) Motormen

ii) Traffic Controller

iii) Station Master / Superintendent

iv) Traction Power Controller

v) Engineering supervisors

vi) Electrical supervisors (pump)

B.5.2.3. DUTIES OF THE INVOLVED STAFF

(a) Duties of Motormen

(i) As soon as the Driving Motorman finds that the water level inside the tunnel at any location between stations has come above the drain, he should inform the conducting motorman to observe the same and note the km of the flooded location and the time of passing the location.

(ii) Message of such flooding should be passed on by the conducting Motorman to the Central Control i.e. Traffic Controller immediately through the radio telephones. In case the radio telephone is defective the message should be transmitted on arrival at the next station.

(iii) In case the Driving Motorman finds that the water level is very high and is almost touching the bottom of the 3rd rail, or the extent of flooding is such that the water

level may touch the 3rd rail before he is able to negotiate the flooded area, he should stop short of the location and contact the Traffic Controller through radio telephone and be prepared for instructions for detrainment of passengers through the rear of the train. In case of failure of radio telephone, he should use the emergency control lines for contacting the Traffic Controller.

(iv) While contacting the Traffic Controller or the SM/SS, the conducting Motorman should give the assessed depth of the water level below the bottom of the 3rd rail.

(b) Duties of Traffic Controller

(i) On receipt of any message of flooding inside the tunnel, the Traffic Controller should inform the Traction Power Controller about the situation.

(ii) He should also inform the IOWs concerned and other section engineers incharge of the section concerned for immediate action, requesting an urgent feedback regarding the safety of running trains (it is the engineering official who will decide whether or not it is safe to run trains -refer Para 4.6 of the Accident Manual).

(iii) The Traffic Controller should control the train services depending on the level of water reported by the conducting Motorman, If the location is near the station, he should ask the SMs concerned or any other responsible staff available at the station to visit the site and inform the details of flooding condition so that train services can be controlled accordingly.

(iv) In case of stoppage of train services the Traffic Controller should inform the various stations the reason for stoppage of train services and ask the Station Master to announce the same over PA system at the respective station.

(v) In case the train, which has reported the flooding, is not able to proceed, the Traffic Controller should initiate action for switching off 3rd rail power and order detrainment of passengers by bringing the train back to the station in rear, if possible, or detrain the passengers from the rear of the train as procedure detailed above.

(v) He will inform his superior Officer about the situation.

(c) Duties of Station Supdt. / Traffic Supervisor

On receipt of the (i) Arrange for suitable announcement through the station PA system for information of the passengers waiting at the station.

(ii) In case of detrainment send suitable staff to platform to guide the passengers to safety.

(iii) He will arrange to get it verified whether the source of flood water is in the station area. In case it is so, the fact should be intimated to the Traffic Controller with as much detail as is possible.

(d) Duties of Traction Power Controller (TPC)

(i) On getting information from the Traffic Controller, TPC should immediately inform the supervisor and staff of the section responsible for running the de-watering pumps to proceed to the site without delay and ensure working of the pumps.

(ii) He will also ensure that power supply to the pumping installation is intact.

(iii) In case of any power failure detected by him, staff of the respective section should be deputed for restoration of the power supply immediately for working of pumps.

(iv) He will inform the concerned officers of the Electrical Department for proper working of the pumping installation.

(v) He will mobilize staff from the nearest location by arranging transport if required to reach the site at the earliest.

(e) Duties of Engineering Supervisor

On receipt of information from the Central Control about the flooding, the Civil engineering supervisor in charge of the section will :

(i) Immediately proceed to the site with staff and necessary tools.

(ii) On reaching the site he should assess the reasons for flooding as detailed above.

(iii) He should then inform the Traffic Controller whether or not it is safe to run trains and the action taken by him and the time required for repairs/restoration in case train service is stopped.

(iv) He should ensure that the outflow at the ground level is functioning properly and that water is being pumped out from the sump. He should keep a constant watch to keep the inlet to the sumps free of all obstructing materials.

(f) Duties of Electrical Supervisor

On receipt of information from TPC, supervisor in-charge of the pumping installation of the section will mobilize his staff to the site of flooding and then to the pumping installations from where water of that particular section is pumped out. He should check working of the pumps and as required he will ensure that all the sets of pumps installed are in working condition and are pumping water satisfactorily.

B.5.3. SABOTAGE

Sabotage is criminal interference with any part of working machinery of the Metro Railway with the object rendering it inoperative or any criminal act intended to cause damage to Metro Railway property. Sabotage may occur anywhere in the Metro Railway's jurisdiction of action but its effect in Metro Stations in section between two stations or in running train will have profound impact in terms of human distress.

(a) Action to be taken by the Station Master

(i) He will visit the affected spot and assess the extent of damage inflicted on Railway property and how that might have affected the passenger service.

(ii) He will immediately inform the Central Control about details of the happening, the time when it occurred and how it will affect the train services, passenger movement etc. He will ask for Medical assistance, if necessary, and indicate the gate through which the Medical Team should enter.

(iii) He, depending on the seriousness, may announce through the station Public Address system what has happened and what the passengers are expected to do without getting into panic.

(iv) In case any Railway property is seen to be damage, he should immediately inform the Section-in-charge of the Department to immediately attend the affected spot and take suitable remedial action.

(v) In case any person is seen to be moving with doubtful intentions, he may be detained for interrogation.

(vi) Passengers found near the affected zone may also be asked about their first hand knowledge of the occurrence.

(b) Action to be taken by the Central Control

(i) Immediately on receipt of the sabotage information, Chief Controller will contact the RPF and ask them to rush to the spot of occurrence and cordon off the area so that the evidences are conserved to the extent possible.

(ii) He will inform the Medical Department to reach the spot with necessary medicines, ambulances etc. (in case of any injury to any person due to the sabotage) through the gate as advised by the Station Master.

(iii) He should thereafter inform the Chief Operations Manager the details of the occurrence and the action already taken by him and receive directions from him for further actions.

(iv) Relay required directives to the persons concerned.

(v) Hold trains at the earlier station in case it is considered that the running of train through the affected station is not desirable and arrange for detrainment of passengers after proper announcements.

(vi) Inform Section in charge of Civil, Electrical and Signal Department of the incident and ask them to go to the spot immediately.

(c) Action to be taken by the RPF

(i) On being informed about the sabotage, they will rush to the spot and immediately cordon off the area.

(ii) After inspection of site lodge a FIR with the local police.

(iii) Question any doubtful person detected earlier by the Station Master or by them and if necessary, arrest them.

(iv) In case of fire, immediately inform the Fire Brigade to rush to the spot for combating the fire.

(d) Action to be taken by the Other Staff

(i) The Section Chiefs of all the three service departments viz. Civil, Electrical and Signal Department will visit the site immediately and assess the damage inflicted on equipments under their respective charges.

(ii) Take suitable action, including informing their higher authorities, to restore the damage to the equipments/installations in least possible time.

B.5.3.1. Sabotage in Section between Two Stations

(a) Action to be taken by the Motorman

When sabotage takes place in the section between two stations, it is the Motorman of the running train(s) who will come to know about it first whose duty will be :

(i) On noticing any unusual occurrence on track or other installation, he should immediately report to the Central Control about the unusual sight with its location.

(ii) In case it is possible to run through the spot, he should continue the journey.

(iii) In case he notices a situation where train running will not be safe, he should stop the train and inform the Central Control for further directive.

(iv) Similar action should be taken by the Motorman in case he notices abnormality in the other track also indicating to the Controller whether passage of a train over the affected section will be safe.

(v) Take further action as per the directive of the Central Control.

(b) Action to be taken by the Central Control

(i) On receipt of such information, the Controller should immediately take action to regulate trains to prevent their running over the affected section.

(ii) Inform the RPF about situation and take action to enable the RPF to make an immediate on the spot inspection.

(iii) Inform the superior officers about the situation and get directive from them for further action.

(iv) Take necessary action as per the directive of the superior officers.

(v) Inform Section-in-charge of Civil, Electrical and Signal Departments to make an on the spot inspection to assess loss/damage etc.

(vi) In case train running to Car shed is unsafe, control trains in earlier stations and arrange for detrainment of passengers after proper announcement.

(c) Action to be taken by the RPF

(i) On being informed, they should go to the affected spot and make a detailed assessment of loss and probable method adopted for sabotage. To reach the spot, they should ask the Controller for power block and go to track bed only after confirming that 3rd rail power has been switched off.

(ii) Make a FIR to the Local Police on the case after inspection of spot and assessing the effect of the sabotage.

(d) Action to be taken by the other staff

Other concerned staff of Civil, Electrical and Signal Departments should make an immediate inspection of the site, assess loss/damage and organize necessary repairs as early as possible. Inform their superior officers about the situation and the action they are taking to rectify the situation. In case of any specific directive from superior officers, they should act according to those directives.

B.5.3.2. Sabotage in Train

Of all the sabotage actions, those happening inside a train will have most disastrous consequences and very prompt action will be necessary to restrict the damage to men and material. The following are envisaged towards sabotage activities:

(i) Bomb in track which detonates under a train.

(ii) Detonation of bomb inside a coach.

(iii) Criminal interference with train running equipments which causes fire to the coaches, while on run.

(iv) Other sabotage activities incapacitating the train in the section.

(v) Sabotage activity in any other area than the station premises or in tunnel

(i) Bomb blast on track

There may be derailment of the train with large scale damage to the train, tunnel structure as well as injury to the passengers in the train. In case of derailment, the train will immediately come to a stop. The Driving Motorman (and in case he is already injured, the Conducting Motorman), will try to contact the other motorman and try to assess the situation and immediately inform the Traffic Controller about the occurrence and ask for immediate assistance of RPF and Medical Department. At the same time the motorman should seek permission for detrainment of passengers. For detraining the passengers, action should be taken immediately. In case, the situation does not permit detrainment from one end, it should be arranged from both ends. The injured passengers will have to be treated locally or transferred to hospital as soon as the Medical Team arrives at the spot. In case the motormen cannot communicate with each other, both of them should independently try to assess the

situation and take action to inform the Traffic Controller and also the action as indicated above.

(ii) Bomb blast inside the train

It will be the endeavour of the Driving Motorman to run the train to the next station as quickly as feasible. In case he is not able to take the train to the next station, he should stop the train and contact the Conducting Motorman to ascertain from him, if he has any knowledge of the situation. Immediately thereafter he should contact the Traffic Controller and inform him about the blast. He should seek from the Traffic Controller the assistance of RPF and Medical Department. He should now ask Conducting Motorman to make an on the spot assessment of the situation including injury/death of passengers. The Conducting Motorman will inform the same to the Traffic Controller for immediate appropriate action.

At the same time, he should take the permission of the Traffic Controller to detrain the passengers. In case one of the Driving Motormen is incapacitated or the communication between them is disrupted, then the other motorman should take all the above actions himself. After assessing the situation and informing the Traffic Controller, the Motorman should make announcement to the passengers through train Public Address system about the situation and should repeatedly ask them to remain calm indicating that action has already been taken to arrange for detrainment of passengers. On arrival of the RPF and Medical Team, they should be brought inside the train through emergency cab door and the step ladder and they should be shown the affected coach/coaches so that immediate medical assistance may be given to the passengers in distress. The Motorman will thereafter arrange to detrain the passengers with the help of the RPF staff and other staff which may have already arrived at the site by this time.

(iii) Criminal Interference with train running equipment which causes fire to coach

In case of a fire in the train due to any criminal interference with train running equipment, the matter should be dealt with as in the case of fire in a train dealt in

(iv) Other sabotage activities incapacitating the train in the section

In this case, arrangement should be made to detrain passengers as given in Chapter for Detrainment of passengers in a section.

(v) Sabotage activity in any other area than the station premises or in tunnel

In case sabotage activity has taken place in any other place than the station or tunnel, action will have to be taken by the official /officer in-charge of the place of occurrence. In that case, he will have to deal with that situation like a Station Master when the sabotage occurs in station area.

B.5.4. STAMPEDE

(i) Stampede is a sudden rush of a crowd of panic stricken people. It may result in extensive damage to property, injury to persons or even loss of human life and may cause acute distress to persons caught in the rush. The main causes leading to stampede are:

(i) Fire or sabotage or serious accidents inside the Metro stations and tunnel leading to passengers rushing out of the system for safety.

(ii) Unusual rush of passengers during night service runs i.e. During Puja festivals and other festivals.

(iii) Unusual rush of passengers after big matches (Football, Cricket etc.), political rallies, especially in Maidan area.

(iv) Unusual occurrence in the Metro Rail services, leading to heavy accumulation of passengers in a particular Metro Railway platform.

(v) Natural calamity like heavy rains etc. leading to a rush of passengers into the Metro Railway stations.

(vi) Heavy rush of passengers in peak hours due to dislocation of other modes of city transport.

(ii) Stampede can occur anywhere in the station premises and as such it is the primary duty of the station staff to control the situation. In serious cases the help of RPF and local police may be needed. Medical attention may be necessary for the injured. Stampede can occur most possibly in the following areas of the Metro Railway system:

(i) Entry and Exit points leading to Metro stations.

(ii) Station concourse in front of ticket counter and entry / exit gates leading to platforms.

(iii) Near escalators and stairs.

(iv) Passenger platforms.

(iii) On reaching the station, In-charge of the Medical Unit should report to the SM/SS of the concerned station and help the station staff in rendering First Aid and other medical help as required to the passengers or staff affected by the stampede. At this stage the In charge of the Medical Unit may request SM/SS to announce through the station PA system regarding availability of medical facility.

(iv) In case of serious injury, the person/persons affected should be removed to the nearest hospital by ambulance or any other vehicle available outside the

(a) Duties of Electrical Staff at the Station

(i) In case of any stampede or stampede - like situation, Electrical staff on duty will ensure that lights and emergency lights are in working condition and they should remain available of passengers. at the switch room to ensure that lighting is proper for dispersal Escalators working at the station may be stopped to avoid any untoward incident or running escalators.

(ii) All under-platform exhaust fans should be kept working normally.

(b) Duties of S & T Staff at the Station

The S & T Staff at the station should ensure that the following are in working order and they should be available there till the crisis is over :

(i) Station PA system.

(ii) Telephone system and communication with the Central Control

(iii) Closed Circuit TV system.

In case no S & T Staff is available at the station, the Signal Control Staff at the Central Control may be directed to immediately depute a suitable person from any other location where such staff is available to carry out the functions stated above.

C.1. RESOURCE INVENTORY OF KOLKATA MUNICIPAL CORPORATION

C.1.1. KMC HEALTH DEPARTMENT

C.1.1.1. List of Urban Primary Health Centres, Maternity Homes and Dispensaries of KMC

SL. No.	Borough	Ward	Address
1	1	UPHC-1	1-B Gopal Chatterje Road, Kolkata -700002
2	1	UPHC-2	126, Kali Charan Ghosh Road, Phoara More
3	1	UPHC-3	Paikpara 1St Row, 21 Raja Manindra Road, Kolkata- 700037
4	1	UPHC-4	26/59, Dumdum Road, Kolkata-700002
5	1	UPHC-5	The Crossing of Indra Biswas Road & Tarasankar Sarani, Kolkata-700037 (Near Tala PS)
6	1	UPHC-6	3,Gopal Mukherjee Road
7	1	UPHC-7	78/4, Bagbazar Street, Kolkata -700003
8	1	UPHC-8	56/1, Raja Raj- Ballav Street, Kolkata-700003
9	1	UPHC-9	5A, Raja Nava Krishna Street, Kolkata-700005
10	2	UPHC-10	18, Bhupen Bose Avenue, Kolkata-04
11	2	UPHC-11	160, Aurobinda Sarani, Kolkata-6, (Hatibagan Dispensary)
12	2	UPHC-12	2/C, Nilambar Mukherjee Street, Kolkata-06
13	2	UPHC-15	82 Raja Dinendra street, Kolkata-06
14	2	UPHC-16	19A, goabagan Street, kolkata-06
15	2	UPHC-17	22, Nilmoni Mitra Street, Kolkata-06
16	2	North Maternity Home	22, Nilmoni Mitra Street, Kolkata-06
17	2	UPHC-18	21/1 Masjid Bari Street, Kolkata-06
18	2	UPHC-19	11/A, Nather Bagan street, Kolkata-05
19	2	UPHC-20	20/1B, Brindaban Basak Street, Kolkata-05
20	3	UPHC-13	17, Ultadanga Main Road, Kolkata-67
21	3	UPHC-14	123, ultadanga main Road, Kolkata-67
22	3	UPHC-29	40 Canal East road, Kolkata-11
23	3	UPHC-30	11 BJ.N.T.P. Lane, Kolkata -11
24	3	Narkeldanga DISP	109, Narkeldanga Main Road, Kolkata-54
25	3	Maniktala Chest Clinic	34, UC Banerjee Road, Kolkata-54
26	3	UPHC-31	P-19 CIT Road, near Phulbagan Bata Crossing
27	3	UPHC-32	105, Satin sen Sarani, Kolkata-54
28	3	UPHC-33	CIT Road and Hemchandra Naskar Road Sarani Crossing, near Nandi House, Beliaghata, kolkata-10
29	3	UPHC-34	13, Kalitara Bose Lane, kolkata-10

SL. No.	Borough	Ward	Address
30	3	UPHC-35	94, K.G Bose Sarani, Kolkata-85
31	4	UPHC-21	26 Joraban Street, Kolkta-06
32	4	Strand Bank Chest Clinic	P66/1/2, Strand Bank Road Kol-6
33	4	UPHC-22	21, Maharshi Debendra Road. Kolkata-700007
34	4	UPHC-23	3, Raja Brojendra Narayan Street. Kolkata-700007
35	4	UPHC-24	24/1, Nimtalaghat Street. Kolkata-700006.
36	4	UPHC-25	9A, Baranashi ghosh Lane. Kolkata-700006
37	4	UPHC-26	171, Ramesh Dutta Street, Kolkata-700006
38	4	UPHC-27	36/A, Modan Mitra Lane. Kolkata-700006.
39	4	Dental and ENT Clinic	26/1, Beadon Street, Kolkata-700006
40	4	UPHC-28	28, Sadhana Sarkar Udyan, 294/2 APC Road, Kolkata-700009
41	4	UpHC-38	5, Fakir Chand Mitra Street. Kolkata-700009
42	4	UPHC-39	4, Marcus Square. Kolkata-700007
43	5	UPHC-36	10 HARSHI STREET, 2nd Floor, KOL - 9
44	5	Nafar Kolay Dispensary	7, NAFAR KOLEY ROAD . KOL - 15
45	5	UPHC-37	97, BAITHAK KHANA ROAD. IST FLOOR KOL - 9
46	5	UPHC-40	27,SURYA SEN STREET. KOL - 12
47	5	UPHC-41	25, Balmukunda Macker Road, Kol-7
48	5	UPHC-42	Opp111, N.S Road, under Fly Over, Kol-1
49	5	UPHC-43	12B, Mahatma Gandhi Road, kol-7
50	5	UPHC-44	4, Nil Madhab sen Street, Kol-73
51	5	UPHC-45	OPPO. 18, WOOD MOUNT STREET. (UNDER HOWRAH BRIDGE APPROACH FLYOVER.) KOL - 1
52	5	UPHC-48	4/1D MADAN DUTTA LANE.(FULBAGAN BUSTEE) KOL - 12
53	5	UPHC-49	27/1 SASHI BHUSAN DEY STREET. KOL - 9
54	5	UPHC-50	Santosh Mitra square, Kol-12
55	6	UPHC-46	133/1, S.N Banerjee Road, Kol-13
56	6	Central Dispensary	5, S. N. Banerjee Road, Kol - 700 012
57	6	UPHC-47	16, Jadunath Dey Road, Kol - 700 012
58	6	UPHC-51	15, Raja Subodh Mullick Square, Kol - 700 012
59	6	UPHC-52	47, Collin Street, Kol 700 016
60	6	UPHC-53	32, Doctor Lane. Kol -14
61	6	UPHC-54	3, Girish Chandra Bose Road, Kol - 700 014
62	6	Malaria Clinic	P-65 Dr. Sundari Mohan Avenue, Kol - 14
63	6	UPHC-60	Ladies Park, Dr. Sundari Mohan Avenue, Kol - 14
64	6	UPHC-61	42, Jannagar Road, Kol- 700 017
65	6	UPHC-55	6, Bechulal Road, kol-14
66	7	UPHC-59	6, Mahendra Chatterjee Lane, Kol-46
67	7	UPHC-62	21, Haji Md. Mohsin Square, Kol - 700 016
68	7	UPHC-63	9/1, A.J.C. BOSE ROAD, KOLKATA - 17
69	7	UPHC-64	26, DILKHUSA ST., KOLKATA- 17

SL. No.	Borough	Ward	Address
70	7	UPHC-65	9B, TILJALA SHIBTALA LANE, KOLKATA - 39
71	7	UPHC-56	21/1, R.N.C. ROAD, KOLKATA - 15
72	7	UPHC-57	48K, D.C.DEY ROAD, KOLKATA - 15
73	7	WHU-58	12, G.K. ROAD, KOLKATA - 46
74	7	UPHC-58	2, DHAPA ROAD, KOLKATA -
75	7	Champamani Maternity Home	59, CHRISTOPHER ROAD, KOLKATA - 46
76	7	Gobra Dispensary	59, CHRISTOPHER ROAD, KOLKATA - 46
77	7	Tangra Chest Clinic	15/1 Hughes Road
78	8	UPHC-66	38, SRIDHAR ROY ROAD, KOLKATA - 39
79	8	UPHC-67	13A, SWINHOE LANE,KOL - 42
80	8	UPHC-68	175/2, Rashbehari Avenue, Kol-700019
81	8	UPHC-69	36, Ballygunge Circular Road, Kol-700019
82	8	UPHC-70	Chakraberia Rd.(North)(Triangular park) Kol-700020
83	8	UPHC-83	240, Kalighat Road, Kol-700026
84	8	UPHC-84	7, Nakuleshwar Bhattacharya lane, Kol-700026
85	8	UPHC-85	3A, Dover Terrace,Kol-700019
86	8	UPHC-86	Jatin Bagchi Road,(7 Lake Camp) Vivekananda Park, Kol-700029
87	8	UPHC-87	Southern Avenue & Lake Palace Crossing, (on Boulevard) Kol-700029
88	8	UPHC-88	102/1,Tollygunge Road, Kol-700026
89	8	UPHC-90	Meghnad Saha Sarani (Southern Avenue), Kol-29
90	9	Ward 69 Dispensary	Opp Quest mall/ besides KMCP School), 9 Ahiripukur Road, Kol-19
91	9	UPHC-71	Bhowanipur Dispensary26, Debendra Ghosh Road,Kolkata – 700025
92	9	UPHC-72	Rammoy Road, Ladies Park,Kol-700025
93	9	UPHC-73	118 Hazra Road Kolkata -26
94	9	UPHC-74	19B, Chetla Hut Road, Kolkata-27
95	9	UPHC-75	2,NITYA GHOSH STREET,KOL-23
96	9	UPHC-76	KABITIRTHA PARK,KOL-23
97	9	UPHC-77	15,DENT MISSION ROAD,KOL-23
98	9	Khidderpore Maternity Home	35/1,EKBALPUR ROAD,KOL-23
99	9	Mansatala Chest Clinic	6, Manashatala Lane, Kol-23
100	9	UPHC-78	47,EKBALPUR ROAD,KOL-23
101	9	UPHC-79	49/22,KARL MARX SARANI,KOL-23
102	9	UPHC-80	3 NO,HIDE ROAD, KOL-4
103	9	UPHC-82	29/5,CHETLA CENTRAL ROAD,KOL-27
104	9	Alipur Dispemsary	34,JUDGE COURT ROAD,KOL-26
105	10	UPHC-89	48, K.P. Roy Lane, Kol - 700033
106	10	UPHC-94	217, Prince Anwar Shah Road, Kol - 700033

SL. No.	Borough	Ward	Address
107	10	UPHC-95	34B,Samajgarh (Mina Para Road), kol-700040
108	10	UPHC-96	3 Layalka Road,Kol - 700092, Tollygunge Chest Clinic
109	10	UPHC-97	93, Chandi ghosh Road, Kol-40
110	10	UPHC-98	180, N.S.C.Bose Road, Kol - 700040
111	10	UPHC-99	2No. Sree Colony, Vivekananda Park, Kol - 700092
112	10	UPHC-100	N.S.C.BOSE ROAD, NEAR RATHTALA BAZAR, KOL - 700047
113	10	UPHC-81	16 No. Mondal Temple Lane, Kol - 700053
114	10	UPHC-91	45, N.K.Ghosal Road, Kol - 700042
115	10	UPHC -92	SahidTarakeswar Sen Park, Babubagan, Kol - 700031
116	10	UPHC -93	Lake Gardens, Bangur Park, Kol - 45
117	11	UPHC-103	6/177 A, Bidhan Colony, Purba rajpur, Kol-75
118	11	UPHC-104	47 Garfa Main Road, Kol-75
119	11	UPHC-110	Birji Malaria Clinic Gajipukur Water Pump, kol-84
120	11	UPHC-111	A5 Atabagan , Boral, Garia, Kolkata - 700 084
121	11	UPHC-112	Madhyapara, Basdroni, Kol-70
122	11	UPHC-113	Sree kanan Saraj Sangha Play Ground, Kol-70
123	11	UPHC-114	Soujasree Club, Purba Putiary, Kolkata-700 093
124	11	MTB TB Hospital	
125	12	UPHC-101	Phoolbagan Melar Math, Kolkata-86
126	12	UPHC-102	Bahadur Math, Near Sikhshabithi School, Kolkata-32
127	12	UPHC-105	Nelinagar, Kol - 78 (Near Haltu School)
128	12	UPHC-106	Ramlal Bazar, K.M.C. Market, Kol - 78
129	12	UPHC-107	10, P. Majumdar Rd., Kol - 78 (Near Kayasthapara More)
130	12	UPHC-108	Nonadanga
131	12	VIP Nagar	Beside Anandamargee School, Kolkata-110
132	12	UPHC-109	Mukundapur, Kol - 99 (Beside Mukunda Bhaban)
133	13	UPHC-115	Dhara Para, Pump House, Karunamoyee Ghat Road, Kolkata-82
134	13	UPHC-116	294, Roy Bahadur Road, Kolkata-53
135	13	UPHC-117	1, K.P Lane, Kolkata-38
136	13	UPHC-118	224, S.N. Roy Rd., Kol-34
137	13	UPHC-119	3, S.N. Roy Rd., Kol-38
138	13	UPHC-120	COCA-COLA Bagan, 68- Bamacharan Roy road, Kolkata-38
139	13	UPHC-122	Daktarbagan Brick Field Road, Kolkata-82
140	14	UPHC-121	132, Pashupati Bhattacharjee Road, (P.C. sen Colony) Kol-34
141	14	UPHC-127	Sarsuna Satellite Township Near Sarsuna College, Kolkata-700061
142	14	UPHC-128	Jai Hind pally, P.O. Sarsuna, Kolkata-61
143	14	UPHC-129	Gopal Mishra Road, Kol-34

SL. No.	Borough	Ward	Address
144	14	UPHC-130	Behind Manton Super Market, Diamond Harbour Road, Behala, Kolkata-34
145	14	UPHC-131	28/1, Panchanantala Road, Kol-34
146	14	UPHC-132	Upen Banerjee Road, Nababani Sangha Park, Parnasree Bus Stand Kolkata-700060.
147	15	UPHC-133	J/315, Askhoy Kanan (Paharpur Road) Kolkata-24
148	15	UPHC-134	Alif Nagar, Algra majdoor lane, Kolkata-700024
149	15	Ward 134 dispensary	B-3, Prince Dilawar Jah Lane, Kolkata-24
150	15	Garden reach Maternity Home	Prince Dilawar Jah Lane, Kolkata-24
151	15	UPHC-135	1st floor of Shyama charan Pal KMCP School N-194, Mudially Road, Kolkata-700024
152	15	UPHC-136	Q 457/1, Jele Para, Santoshpur Road, Kolkata.- 24
153	15	UPHC-137	S1- Murray Road (Amb. Centre) Kolkata.- 24
154	15	UPHC-138	Bartala Rail Line, Kolkata.- 18 (Opp. Purbasa KMC Primary School)
155	15	UPHC-139	U 119/1, Akra Road, (Panikol Amb. Centre) Kolkata.- 18
156	15	UPHC-140	Khaldhari Road, (Mallick Para) Kolkata.- 18
157	15	UPHC-141	Z3-154/1, Dr. A.K. Road, (Prantik) Kolkata.- 44
158	16	UPHC-123	2, Raja Rammohan Roy Rd., Kol-8
159	16	UPHC-124	Das Para, opposite Booster Pumping Station, Thakurpukur, Kolkata-63
160	16	UPHC-125	Backside of Bramhapada KMC Primary School Jagir Ghat Road, Kolkata-700063
161	16	UPHC-126	Annjuman Corporation Primary School 76, Ho-chi-Minh Sarani Kolkata-700061
162	16	UPHC-142	Company pukur Kolkata-104
163	16	UPHC-143	Diamond harbour Road, Diamond park, joka, kolkata-104
164	16	UPHC-144	Diamond harbour Road, Diamond park, joka, kolkata-104

C.1.1.2 List of Ambulances of KMC

Registration No.	Model	Condition (Functional/Non- Functional)
WB04H 0829	BOLERO AC	Functional (Ambulance HQ)
WB04H 0814	BOLERO AC	Functional (Ambulance HQ)
WB04H 0844	BOLERO AC	Functional (Ambulance HQ)
WB04H 0812	BOLERO AC	Functional (Ambulance HQ)
WB19J 1358	BOLERO AC	Functional (Ambulance HQ)
WB04H 0831	BOLERO AC	Functional (BR. XII)
WB04H 0826	BOLERO AC	Non-functional (BR.XI)
WB04H 0840	BOLERO AC	Functional (B.R. XIV)
WB04H 0819	BOLERO AC	Functional (B.R. XVI)

Registration No.	Model	Condition (Functional/Non- Functional)
WB04H 0836	BOLERO AC	Non-functional (Ambulance HQ)
WB04G 9915	BOLERO AC	Functional (B.R. XV)
WB04D 4033	MARUTI OMNI	Functional (Garden Reach Maternity Home)
WB04D 4034	MARUTI OMNI	Functional (Ambulance HQ)
WB04D 4032	MARUTI OMNI	Non-functional (Ambulance HQ)
WB04F 8248	MARUTI OMNI	Non-functional (Ambulance HQ)
WB04F 2130	MARUTI OMNI	Non-functional (Ambulance HQ)
WB04F 9667	MARUTI OMNI	Non-functional (Champabani Maternity Home)
WB04D 4036	TATA WINGER	Functional (Ekbalpur Maternity Home)
WB04D 4039	TATA WINGER	Non-functional (Ambulance HQ)
WB04D 4037	TATA WINGER	Functional (Ambulance HQ)
WB04D 4035	TATA WINGER	Non-functional (stay at SWM Work Shop)
WB04D 4038	TATA WINGER	Functional (B.R. XII)
WB19F 8025	FORCE TRAVELLER	Non-functional (Ambulance HQ)
WB04A 7434	MAHINDRA JEEP	Non-functional (Ambulance HQ)
WB04A 7432	MAHINDRA JEEP	Non-functional (Ambulance HQ)
WB04A 5123	MAHINDRA JEEP	Non-functional (Ambulance HQ)
WB04A 5293	MAHINDRA JEEP	Functional (Ambulance HQ)
WB04A 5296	MAHINDRA JEEP	Non-functional (Ambulance HQ)
WB19E 8142	TATA SUMO	Non-functional (Ambulance HQ)

C.1.1.3. List of Crematoriums / Burning Ghats managed by KMC

- Cossipore Mahasmashan
- Nimtola Burning Ghat
- Kashimitra Burning Ghat
- Birjunala Burning Ghat
- Sirity Burning Ghat
- Shanagar Burning Ghat
- Dhapa Electric Crematorium (only for unclaimed bodies)

C.1.1.4. List of Hindu Burial Grounds managed by KMC

- Bhatchala Hindu Burial Ground
- Muraripukur Hindu Burial Ground
- Topsia Hindu Burial Ground

C.1.1.5. List of Muslim Burial Grounds managedbBy KMC

- Bagmari Muslim Burial Ground
- Gobra Muslim Burial Ground I
- Gobra Muslim Burial Ground II
- Gobra Muslim Burial Ground III
- Soloana Muslim Burial Ground
- Garden Reach Muslim Burial Ground

C.1.2. KMC SEWERAGE AND DRAINAGE DEPARTMENT

C.1.2.1. List of Equipments

Name of the Equipment	Total Numbers
Manhole desilting machine	70
Open nullah desilting machine	5
Gully pit emptier machiene	19
Jetting cum suction machine	14
Jetting machine	5
Suction machine	2
Blow vac machine	5
Power bucket machine	30
Portable dewatering pump	71

C.1.2.2 List of Drainage Pumping Stations

Sl No.	Name of the Drainage Pumping Station	No. of Pumps	Telephone No.	Remarks
1	Manicktala Drainage Pumping Station	5	2350-1166	Tapan Sarkar Ex. Engineer (E)/MDPS/S&D 80137-63737
2	Beerpara Drainage Pumping Station	2		
3	Belgachia Drainage Pumping Station	2		
4	Ultadanga Siphon	1		
5	Maniktala Siphon	1		
6	Marcus Square	2		
7	Dutta Bagan (DWF) New	3	2546-0064	
7(a)	Dutta Bagan (SWF) New	3		
7(b)	Dutta Bagan old	6		
8	Cossipore	3		
9	Jagannath Ghat	4		
10	Dhapalock Pumping Station	9	2323-5536	Dilip Mondal Ex. Engineer(M)/DLPS/S&D 94338- 97764
11	Topsia Drainage Pumping Station	7	2343-4236	
11(a)	Topsia Drainage Pumping Station Point A (DWF)	3	2343-4236	
11(b)	Topsia Drainage Pumping Station Point A (SWF)	4		
12	Ultadanga Pumping Station	11	2359-4621	
13	Slip Road, Durgapore Bridge	3		
14	Untadanga underpass	2		Dilip Mondal Ex. Engineer(M)/DLPS/S&D 94338- 97764
15	Hatisur	5		

Sl No.	Name of the Drainage Pumping Station	No. of Pumps	Telephone No.	Remarks
16(a)	Palmer Bridge Drainage Pumping Station (DWF)	9	2251-2402/ 53	Biswanath Das Ex. Engineer(M)/PBPS/ S&D 98301-09712
16(b)	Palmer Bridge Drainage Pumping Station (SWF	4		
17	Kuliatangra	6		
18	Pagladanga	8		
19	Thantania Pumping Station (Hrisikesh Park)	2	2354- 3748	
20(a)	Ballygunge Drainage Pumping Station (Old station)	7		Kajal Kr.Roy Ex. Engineer (E)/BDPS /B&D 98742-72283
20(b)	Ballygunge Drainage Pumping Station (New Station)	4	2344- 9142	
21	Mominpur Pumping Station	8	2344-9142	
22	Chetla Lock Pumping Station	4	2449- 6630	
23	Nimak Mohal Pumping Station	2	2400-6243	
24	Jodhpur Park Drainage Pumping Station	5		
25	Kalighat Drainage Pumping Station	2	2483-8457	
26	Southern Avenue(SWF)	4	2439-8857	
27	Gokhel Road(SWF)	2	2465-0408	
28	Kanta Pukur (L.S.- 9)	4		
29	Majherhat(L.S. -10)	3		
30(a)	Behala Flying Club(DWF)	6		
30(b)	Behala Flying Club(SWF)	2		
	Total	160		
Taken over Pumping Station				
31	LS-1 (Beside Ratan Babu Ghat)	4		Tapan Sarkar Ex. Engineer (E)/MDPS /S&D 80137-63737
32	LS-2 K.P. Singh Road	4		
33	LS-3, B.T. Road	4		
34	Bangur MPS	5		
35	R.K.Ghosh Road	3		
36(a)	Beerpara New DWF	3		
36(b)	Beerpara New SWF	3		
Under PBPS				
37	Chingrihata	7		Biswanath Das Ex. Engineer (M)/PBPS/S&D 98301-09712
38	Sirity (B.L. Saha Road)	5		
39	James long Sarani (LS-2)	4		

Sl No.	Name of the Drainage Pumping Station	No. of Pumps	Telephone No.	Remarks
Under DLPS				
40(a)	Kamdahari Garia (DWF)	6		
40(b)	Kamdahari Garia (SWF)	6		
41	Baishnabghata Patuli	5		
42	Maniktala Underpass	2		
43	PS 1 Baghajatin	3		
44	PS 2 Jorabridge	6		
45	PS 3 Rajdanga	6		
46	PS 4 Nonadaga	6		Dilip Mondal Ex.Engineer (M)/DLPS/ S&D 94338-97764
47(a)	Chalk Garia (DWF)	2		
47(b)	Chalk Garia(SWF)	4		
48(a)	Ambed Kar Bridge (DWF)	3		
48(b)	Ambed Kar Bridge (SWF)	5		
49(a)	Kasba(DWF)	3		
49(b)	Kasba(SWF)	2		
50(a)	EE1 Minor(DWF)	3		
50(b)	EE1 Minor(SWF)	3		
51	Chowl Patty	5		
Under BDPS				
52	Santospore MPS	5		
53	Jingirabazar MPS	5		
54	Trenching Ground LS	3		Kajal Kr.Roy Ex. Engineer(E)/BDPS / S&D 98742-72283
55	Dhankethi Khal LS	5		
56	Sakuntala Park (Node-C)	6		
57(a)	CPT Canal (DWF)	3		
57(b)	CPT Canal (DWF)	3		
58	Podir Hati	6		
Under KUDGHAT unit				
59	Keorapukur MPS	5		
60	LS-1, Buroshibtala	4		
61	LS-1A , Rathtala (Garia)	3		Supriya Sengupta Ex. Engineer (E)/KUDGHAT/S&D 98303-11559
62	LS-1B Usha Gate 9Raninagar), Garia)	3		
63	LS-2A, Bansdroni	3		
64	LS-2B , Kudhghat Kalibari	4		
65	LS-5, Kudhghat	4		
66	Canal Road Pumping Station	3		

Sl No.	Name of the Drainage Pumping Station	No. of Pumps	Telephone No.	Remarks
Taken Over KMW&SA Pumping Stn(PBPS)				BiswanathDas Ex.Engr(M)/PB PS/ S&D 98301-09712
67	Hesting	5		
68	Sasisekher	5		
69	Tallygunge	3		
70	Tollygunge Golf Club	4		
71	Thakery Road	5		
72	Santi Nagar 2	3		
73	Naktala 2	3		
Total		**205**		
Grand Total		**365**		

C.1.3. KMC SOLID WASTE MANAGEMENT DEPARTMENT

C.1.3.1. List of Equipment of SWM Department, KMC

Sl. No.	List of the machineries	Quantity
1	Bull Dozer	2
2	Loader	6
3	Back Hoe Loader	1
4	Stationery Compactor + Movable Compactor	169+56
5	Mechanical Sweeper	3
6	Street washing Vahicle	21
7	Cess Pool Emptier	5
8	Wrecker	8

C.1.4. KMC PARKS AND SQUARES DEPARTMENT

C.1.4.1. List of Equipments of Parks and Square Department (Used to remove uprooted trees)

1.Mechanical/Hydraulic Saw

2.Hand Saw

3.Axe

4.Nylon Rope

- There are 16 gangs in 16 boroughs (one in each borough). Apart from this there are two gangs in KMC HQ control room. Each gang is equipped with the above mentioned equipments.
- Each gang is equipped with one lorry
- Hydraulic ladder are also used where required. During night four (4) hydraulic ladders are used. During day twelve (12) hydraulic ladders are in operation for trimming and other related purposes.

C.2 RESOURCE INVENTORY OF FIRE AND EMERGENCY SERVICES

C.2.1. List of equipment

Fire Station	Water tender / mp	Water bouser	Water carrier	Mswt	Portable pump	Towing vehicle	Trailor pump	Splappl.	Others uv /rj	Remark
Alifnagar F.S.				2						
Baisnabghata Patuli F. S.	1	1	1							1MP
Canal West Road F.s.	1	1	1							
Central Avenue F.S.	3	5	1	1	5	2		8	4	
Coal Berth F.S.										
Cossipore F.S.	2		1							1WC
Fire Float (Writers' Buildings)				1	1	1				
Garden Reach F.S.	1									
Gariahat F.S.	2									
Head Quarter F.S.	3	3	3	2	4	2	2	6	10	
Kalighat F.S.	2									
Lalbazar F.S.	1			1						
Manicktala F.S.	2	1	1			1	1			
Masterda Surya Sen Fire Station										
Nimtala F.S.	1									
Tollygunge F.S.	2					1				

C.3 RESOURCE INVENTORY OF NDRF

LIST OF MANPOWER	
Inspector	1
Sub inspector	3
S1(Engineers)	2
Sitcoms)	1
Doctor	1
Paramedics	5
HC(GD)	4
HC(Comm)	1
Constable	24
Technician	1
Electrician	1
Follower	1

Total 18 teams x 47 persons per team = 846 personnel and 12 teams can be deployed at a time within 02 hrs after getting warning /information for any disaster depending upon distance.

LIST OF VEHICLES	
Nomenclature (Type of vehicles)	**Nos. Authorised**
Light Vehicle - 38	38
Medium Vehicle - 12	12
Heavy Vehicle - 06	6
Ambulanc-06	6

LIST OF EQUIPMENTS & TOOLS OF EACH TEAM		
NCB EQUIPMENTS		
1	NBC Suit(box)	45
2	Teletector	6
3	NBC Boot	45
4	NBC Boot	
5	NBC Gloves	45
6	Face Mask	45
7	Nose mask universal	45

LIST OF EQUIPMENTS & TOOLS OF EACH TEAM		
NCB EQUIPMENTS		
8	Auto injector (3 BOX)	45
9	Resuscitator	6
10	Mini Rad (external)	6
11	Electronoc Dosimeter	45
12	Air Sampler	2
13	Micro survey paper/Meter	2
14	Alpha Monitor	2
15	DM Kit Box	1
16	Intrigrated Hood Mask	9
17	Respirator with 2 Canister	45
18	Tongs (2ft)	18
FLOOD RESCUE EQUIPMENTS		
1	Inflatable boat with OBM	4
2	Life bouy	45
3	Life jacket	45
4	FRP boat with 40 HP OBM	2
5	Personal Diving Kit (Diving suit, breathing apparatus, weight belt,gloves, dive fins)	2
6	Under water communication set	1
7	Under water Torch	1
8	Floating Pump	1
MFR EQUIPMENTS		
1	PPE	45
2	MFR Kit Box	
3	Oxygen Cylinder 680 (Oxydose) light weight with Accessories	6
4	Rescue Streatcher	2
5	Traffic Cone	15
6	Laud haller	12
LIGHTING AND POWER EQUIPMENTS		
1	Portable generatora Set 2.5 KVA	4
2	Inflatable Lighting Tower	1
3	Extension Cord 8mm dia 100 mtrs long	12
4	Working Lamp with 50M Lead	12
5	Fuel Container 20 Ltrs	24

LIST OF EQUIPMENTS & TOOLS OF EACH TEAM		
CSSR ITEMS		
1	Hard boot toe	45
2	Shoval & Spade	4+4+8
3	Air Lifting Bags with Air Cylinder	1
4	Steel Pipe 4'" dia	60
5	Galvanised Metal Tubes	60
6	Full Body Harness with accessories	2
7	Breaching system	1
8	carbide tipped chain Saw	1
9	Safety Helmate	45
10	come along (2 boxes) with accessories	1
11	Multy cable winch	1
12	Life Detector	1
13	Vectim Location Equipments and Breaching System	1
14	Angle Cutter (Electric) 14" Dia	2
15	Circular Saw	2
16	Bullet Chain Saw(carbide tipped)	2
17	Diamond Chain Saw	1
18	Combination cutter with sprader	1
19	Combination cutter with sprader	1
20	Hammer Drill Concreate	1
FIRE FIGHTING EQUIPMENTS		
1	Exhaust Fan 12"	4
2	ventilator & Air Tube 7 mtr long	2
3	Fire Extingusher Portable	4
4	Breathing Appatatus with cylinder	2
5	Distress Dignal Unit	36

C.4 RESOURCE INVENTORY OF METRO RAIL, KOLKATA

i. **Fire Extinguishers provided at the following points :-**

- Metro Railway Stations (KNAP to KKVS) – 380 nos.
- Electrical Sub-station – 446 nos.
- A.V.Complex – 155 nos.
- Metro Trains – 354 nos.
- Metro Premises – 384 nos.
- Fire Station – 42 nos.

TOTAL Extinguishers – 1761 nos.

ii. **Fire Alarm Systems in Metro railway – 12 nos.**

iii. **AFX (Automatic Fire Extinguishers) – 41 nos**

iv. **Each Metro Station is provided with**

- Four Hose Pipes (15 m length & Two Brunch pipes in a box).
- Different types of Fire Extinguishers.
- Fire Hydrants – 601 nos. KNOA Crashed to KKVS Carshed & Office Building.
- Breathing Apparatus – 5 nos. BA sets provide each underground stations from KBEL to KRSB, 02 nos. each ART Van & 1 no. each Fire Tender).
- Two nos. Full Face Mask provided at each underground Metro station. And two nos. Full Face Mask provided each rake (one no. each Driver Cab).
- Advance Fire Fighting Technology (AFFT), Fire extinguisher – 11 nos. (7 Nos. Surface Metro Station provided on AFT Fire Extinguisher each station, NOA Fire Station -1 & TOL Fire Station – 03 nos.).

v. **Mobile & Static Fire Station facilities available :-**

- Well equipped as per IS: 950 specification Water Tender Fire Engine – 2 Nos.
- Mobile Fire station – Tollygunge & Noapara, Fire station.

vi. **Water pipeline – along with permanent way track with fire hydrants.**

- 27 nos. Water Tanks for supplying water to fire hydrants

vii. **Fire buckets**

viii. **Health Unit at Tollygunge, First Aid Post at Noapara & Dumdum, Lock up dispensary at Metro Bhavan & Belgachia.**

ix. **Battery operated Loco –Three no., (2 at Noapara & one at Tollygunge).**

x. **ART & MFD – Tollygunge & Noapara**

xi. **Pumps for de-watering tunnel accumulations**

- 3 pumps are provided at mid-section sump of every station.

xii. Dispersal facilities – Through the nearest station

- Control Telephone
- Railway auto-telephone (incoming P&T facilities with prefix 225)
- P&T Telephone
- Public Address System
- CCTV monitor
- AFC control equipments
- Power changeover switch.

KOLKATA MUNICIPAL CORPORATION