DISTRICT DISASTER MANAGEMENT PLAN
BEED

2018-2019

DISTRICT DISASTER MANAGEMENT AUTHORITY, BEED

Revenue & Forest Department
(Relief and Rehabilitation)
Government of Maharashtra

FOREWORD

The plan is prepared to help the District Administration for effective response during the disasters. Beed district is prone to natural as well as man-made disasters. Drought & Flood are the major Natural Hazards and fire, rail/road accidents etc. are the main man-made disasters of the district. The Beed Disaster Management Plan includes facts and figures those have been collected from various departments. Beed Disaster Management Plan is first attempt of the district administration and is a comprehensive document which contains various chapters and each chapter has it's own importance. The plan consist Hazard & Risk Assessment, Institutional Mechanism, Response Mechanism, Standard Operating Procedure, Inventory of Resources etc. Hazard & Risk Assessment is done on the basis of past few years disasters data & is collected from all departments. It is suggested that the District Level Officials of different department will carefully go through the plan and if have any suggestions & comments be free to convey the same so that we can include them in the next edition. It is hoped that the plan would provide concrete guidelines towards preparedness and quick response in case of an emergency and help in realizing sustainable Disaster Risk Reduction & mitigate/minimizes the losses in the district in the long run.

Sd/-
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Collector, Beed.

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Chapter 1

1.1 Introduction

Disaster disrupts progress and destroys the developmental efforts often thrashing nation's progress back by several decades. Thus efficient management of disasters, rather than mere response to their occurrence, has received increased attention today. District Disaster Management Plan (DDMP) is an operational module for the District Administration on effective mitigation of different types of disasters with locally available resources and personnel and to provide distressed people with immediate relief. It should also ensure immediate response from the existing administrative structure.

1.2 Purpose of the Plan

There is a paradigm shift in Disaster Management approach from the earlier focus of response and relief to prevention and preparedness. It is certainly possible to reduce the impact of Disasters by evolving appropriate preparedness, mitigation and response plans. It is now realized that process of mitigation should incorporate long term preventive and protective measures by adopting appropriate strategies for disaster prone areas. The mainstreaming of Disaster Risk Reduction (DRR) features into development planning of sectoral departments is one of the key areas identified and incorporated in the plan. It is apt to mention here that the DDMP is developed in line with national disaster (DM Act 2005) management vision of *"shifting the approach from reactive post-disaster response to one of proactive, pre-disaster preparedness and mitigation measures"*. Even the vision of DM Policy, 2009, states to build a safe and disaster resilient India by developing a holistic, proactive, multi-disaster oriented and technology driven strategy through a culture of prevention, mitigation, preparedness and response. The Plan spells out the role sand responsibilities applicable to all phases of the disaster management cycle

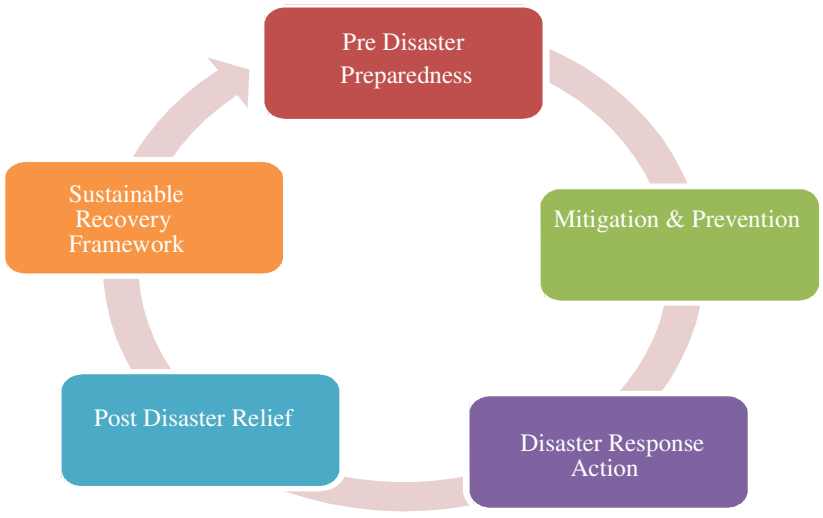


Figure 1.1: Disaster Management Cycle

Earlier, any disaster management was considered as a crisis management function that began with a disaster and closed soon after the relief and rehabilitation. It is now realized that process of mitigation should incorporate long term preventive and protective measures by adopting appropriate strategies for disaster prone areas. The mainstreaming of Disaster Risk Reduction (DRR) and Climate Change Adaptation (CCA) features into development planning of sectoral departments is one of the key areas identified and incorporated in the plan. According to the IPCC SREX report the "risks arising from future extreme events can be avoided primarily at the regional and local level". Adaptation to climate change and risk and disaster management of extreme events can therefore be approached complementarily in dealing with climate change. These approaches can supplement each other in order to reduce exposure and sensitivity and increase the adaptive capacity of humans and the environment.

1.3 Mission

The aim of the plan is to establish necessary systems, structures, programs, resources, capabilities and guiding principles for reducing disaster risks and preparing for and responding to disasters and threats of disasters in respective district, in order to save lives and property, avoid disruption of economic activity and damage to environment and to ensure the continuity and sustainability of development.

The district disaster management plan has a holistic and integrated approach with emphasis on prevention, mitigation and preparedness by ensuring that Disaster Management receives the highest priority at all levels in the district. It has a paradigm shift, similar to the lines of national and state level, from reactive and relief centric approach to disasters. The approach is aimed to conserve developmental gains and also minimize losses to lives, livelihood and property.

This plan is to be used by the key authorities and departments at district level such as DDMA, EOC, DDMC, the Line departments etc. Further, the plan as specific action plans for other stakeholders as well which include the Gram Panchayat committees and the key non government stakeholders

1.4 Key Objectives

Objectives of this DDMP comply with the Disaster Management Act, 2005, which are as below:

- Assess all risks and vulnerabilities associated with various disasters in the district.
- Prevention and minimization of loss of human lives and property by gearing up preparedness, prevention and mitigation of disasters.
- To provide clarity on roles and responsibilities for all stakeholders concerned with disaster management so that disasters can be managed more effectively.
- To strengthen the capacities of the community and establish and maintain effective systems for responding to disasters.

- Developing convergence of action in addressing, preventing and mitigating disasters and to equip with maximum possible relief measures and to resort to pre-disaster, during and post-disaster steps.
- Mainstreaming disaster management concerns into the developmental planning process as well as into climate change adaptation.
- To address gender issues in disaster management with special thrust on empowerment of women towards long term disaster mitigation.
- Developing contemporary forecasting and early warning systems backed by responsive and fail-safe communications and Information Technology support.
- Encourage training and create awareness, mock drills, dissemination of knowledge, and information on disaster management among all the citizens living in the district.
- Ensuring relief and assistance to the affected.
- Undertaking reconstruction as an opportunity to build disaster resilient structures and habitat, promote sustainable recovery framework.
- Undertaking recovery to bring back the community to a better and safer level than the pre-disaster stage.

1.5 Disaster

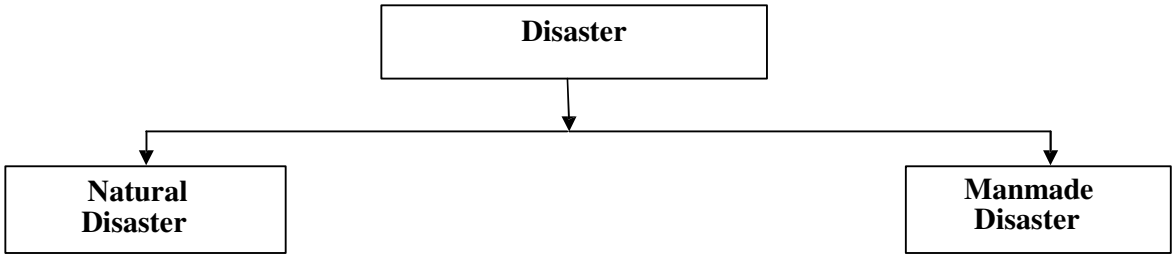
According to DM act of India 2005 is defined as catastrophe or calamity which is caused by natural or man made hazards which results in loss of life, destruction of property and damage of environment which affected community doesn't have resources to cope and require supports of externals agencies or government.

Disaster = Hazards x Vulnerability

1.6 Hazard

Hazards is potential damaging phenomemon or threatening event i.e, Flood, earthquake,cyclone etc are natural hazards.

Types of Disaster



1.7 Disasters identified by The High Power Committee, Government of India

1.	**Water and climate related Disaster**	• Floods and Drainage Management • Cyclones • Tornadoes and Hurricanes • Hailstorm • Cloud Burst • Heat Wave and Cold Wave • Snow Avalanches • Droughts • Sea Erosion • Thunder and Lighting
2.	**Geologically related disasters**	• Landslides and Mudflows • Earthquakes • Dam Failures / Dam Bursts • Mine Fires
3.	**Chemical, Industrial and Nuclear related disasters**	• Chemical and Industrial Disasters • Nuclear Disasters
4.	**Accident related disasters**	• Forest Fires • Urban Fires • Mine Flooding • Oil Spill • Major Building Collapse • Serial Bomb Blasts • Festival Disasters and Fires • Electrical Disasters and Fires • Air, Road and Rail Accidents • Boat Capsizing • Village Fire
5.	**Biologically related disasters**	• Biological Disaster and Epidemics • Pest Attacks • Cattle Epidemics • Food Poisoning

Source: A Report from HPC, GOI in 1999

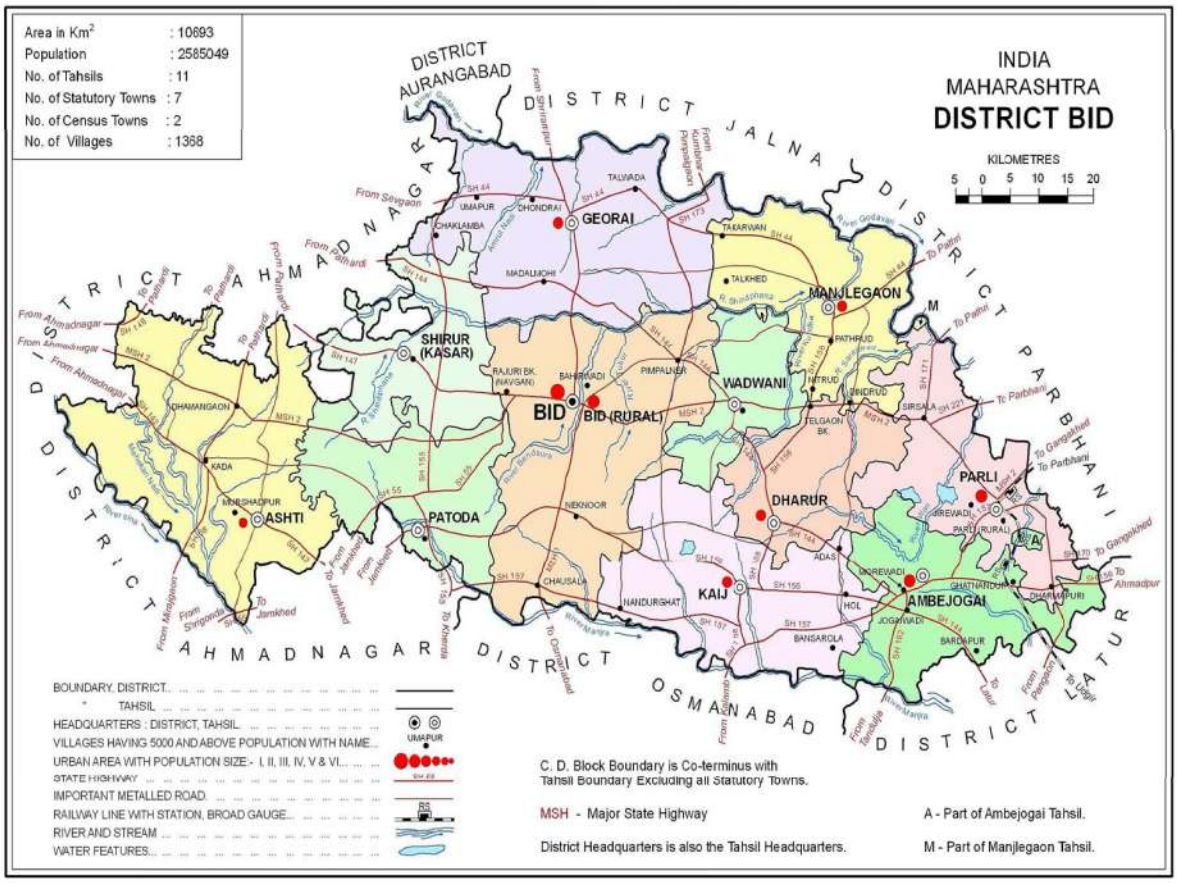


Figure 1.2: Beed District Map

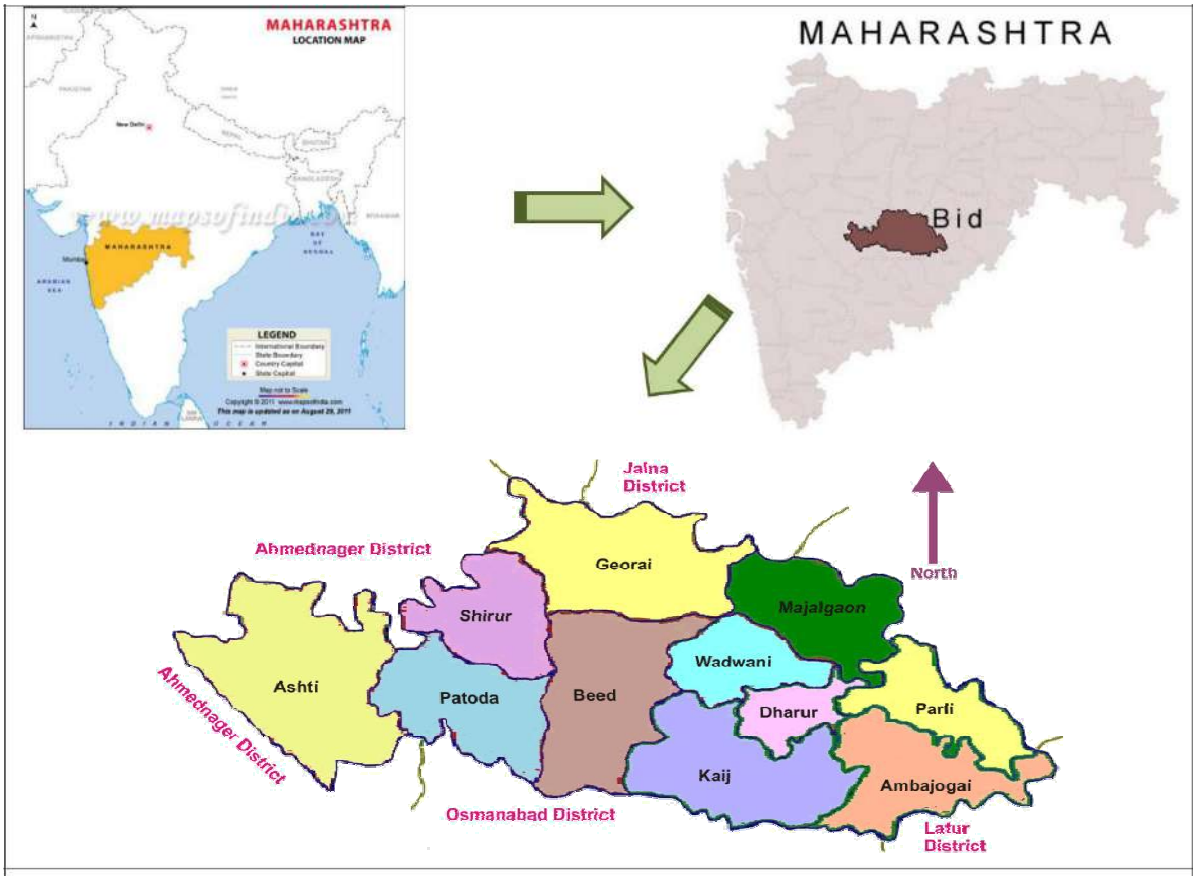


Figure 1.3: Regional Setting of Beed District

1.8 District Profile

1.9 Introduction of Beed District

Beed District was a part of the former Hyderabad State until 1956. Between 1956 and 1960, it was part of the Bi-lingual Bombay State. Finally, since May 1960, it is one of the 35 Districts of Maharashtra State.

1.10 Location

Beed district is located in the central part of Maharashtra in Aurabgabad division and forms a part of Marathwada region. The districtlies between $18^{o}27'$ and $19^{o}27'$ North Latitudes and $74^{o}49'$ and $76^{o}44'$ East Longitudes.The Godavari River forms the boundary of the district throughout the northern border.

1.11 Brief History of the District

The district deriversits name from that of its headquarters town of Beed, earlier known as Bhir, for the origin of which two explanations are given. The town by itself is set in a hollow or a "Beel" into the scrap of the Balaghat plateau trenched by Bandsura river, and hence the name Bhir, the term 'Beel' having undergone transformation in course of time into Beed or Beed. Secondly the Persian word 'Bhir' meaning water, might also explain the origin of the name. Prehistoric account of the district is not available. In course of time when Aryaans came down to south, kingdoms were founded. Agastya was the first Aryan who crossed the Vindhya and fixed his residence on the bank of Godavari. This memorable event is commemorated in the mythological story which represent Vindhya as bending before his guru Agastya, when the latter approached him. The sage asked the mountain to remain in that condition until he returned from south, which he never did. Agastya was followed by several other sages who established their hermitages in different region of the south.

In the 2^{nd} century A.D. Beed was under the rule of Satvahanas Emperors. The earliest coins issued by king Satvahana have been found at Aurangabad and in Vidharba. After the Satvahans reign, came the Vakatakas, Rashtrakutas, Chalukyas and Yadavs all Hindu Kings. Among the Chalukyas, Pulakesin II was a powerful king who held his supremacy over North and South Maharashtra for a long time. The Asmaka country including the district of Beed was annexed to the empire of Pulakesin II in the 7^{th} century A.D.

The 16^{th} century saw the advent and rise of Nizam and Moghuls in the entire country and Beed was no exception. The Marathas revolted against the Moghuls but had heavy set back in this district. The battle of Panipat (1761) was a great disaster for the Marathas. Marathas continued to

rule the district till 1817 i.e. when the struggle between the British and the Peshwas came to an end and the whole country was transferred to the British.

Kaij taluka, which is a tahsil of the present district also, was abolished to merge with Amba taluka in 1905. The name of Amba taluka was subsequently changed as Mominabad taluka. Between 1906 and 1948 there were no major changes in the boundaries of the district. In 1950 twenty six enclave villages of Ahmadnagar district were transferred to Beed district and in return twenty one villages from Patoda and Ashti tahsils were transferred to Ahmadnagar district.

One fourth area of the district was Jagir. The present Patoda tahsil was mostly Nizam's own estate and was called "Sarf-e-khas". It was taken over under the Sart-e-khas (Merger) Regulation, of 1949. With the abolition of all the Jagirs, their villages were taken over uder direct government administration in 1949 under the Hyderabad (Abolition of Jagirs) Regulation 1949. Consequent upon the integration of Sarf-e-khas and Jagirs boundaries of all the tahsils in the district were reconstituted in the year 1950. A new tahsil 'Kaij' was recreated with its headquarters at Kaij. Patodatahsil, which was previously under Sarf-e-khas, was converted with a 'mahal'. Reoganisation of State in 1956 resulted in the transfer of the district from Hyderabad State to Bombay State and since 1st May 1960 it forms a part of Maharashtra State. In 1962, Mominabad tahsil and town was renamed as Ambejogai. Then after 1981, 53 villages of Ambejogai tahsil have been transferred to Laturtahsil of newly formed Latur district.

In 2011 census, the district has 11 tahsils, 9 towns and 1368 villages (including 11 uninhabited villages)

1.12 Administrative Set-Up

There were Major changes in the administrative set-up of Maharashtra after the 1991 Census, resulting in increase of five districts. Greater Bombay district of 1991 census divided into two forming Mumbai and Mumbai suburban districts. Similarly new districts Nandurbar, Washim, Hingoli and Gondiya district were formed bifurcating, Dhule, Akola, Parbhani and Bhandara district respectively. At the time of 2001 Census Konkan division included 6 districts, Nashik division had 5 districts, Pune division had 5 districts, and Aurangabad division had 8 districts, Amravati division had 5 districts and Nagpur division had 6 districts. Thus in 2011 Census, the Maharashtra state has 35 districts spread over 6 divisions. Beed district is in Aurangabad division. In the Beed district 4 tahsils were added. Thus there are now 11 tahsils, 9 towns and1368 villages spread over 11 tahsils viz., Ashti (176), Patoda (105), Shirur-Kasar (94), Georai (197), Manjalegaon (125), Wadwani (45), Beed (226), Kaij (121), Dharur (68), Parli (105), and Ambejogai (106). The following statement indicates, the changes, which occurred after 2001

Census in the number of villages and towns in each tahsil and also the reasons for variation in brief.

Sr. No.	Name of District /Tahsil	No. of villages as per			Number of new Villages created	Number of Towns		Changes since 2001 and Government Notification Number
		2001 Census as in Beed dist.	Adjusted as per 2011 Jurisdiction	2011 Census		2001 Census	2011 Census	
	1	2	3	4	5	6	7	8
	Beed	1365	1365	1368	6	6	9	2 Census Towns created after 2001 Census. 1 Village Kaij merged in Kaij N.P. 6 New villages created after 2001 Census.
1	Ashti	177	177	176	-	-	1	1 New Census Town created after 2001 census.
2	Patoda	105	105	105	-	-	-	-
3	Shirur (Kasar)	94	94	94	-	-	-	-
4	Georai	197	197	197	-	1	1	-
5	Majalgaon	125	125	125	-	1	1	-
6	Wadwani	92	45	45	-	-	-	27 Villages transferred to Dharur tahsil. Noti. No. ZPA/1006/CR49/M-1 dt. 26/06/2006. 20 Villages transferred to Beed Tahsil.
7	Beed	207	227	226	-	1	2	20 Villages transferred from Wadwani tahsilNoti. No. ZPA/1006/CR49/M-1 dt. 26/06/2006 1 New Census Town created after 2001 Census.
8	Kaij	128	122	121	-	-	1	2 Villages transferred to Dharur tahsil. 4 Viillages transferred to Ambejogai tahsil.
9	Dharur	39	68	68	-	1	1	27 Villages transferred from Wadwani tahsil. 2 Villages transferred from Kaij Tahsil Noti. No. ZPA/1006/CR49/M-1 dt. 26/06/2006
10	Parli	105	105	105	-	1	1	-
11	Ambejogai	96	100	106	6	1	1	4 Villages transferred from Kaij tahsil Noti. No. REN/2001/CR-92/M-10 Dt. 28/06/2006 6 New villages created after 2001 Census.

(Source: Census of India 2011)

For administrative purposes the district is divided into 2 sub-divisions and 11 tahsils. Beed sub-division includes Beed, Georai, Patoda, Ashti, Wadwani and Shirur (Kasar) tahsils and Ambejogai sub-division includes Ambejogai, Manjalegaon, Kaij, Dharur and Parli tahsils. The district collecter along with district Judge, superintendent of Police, Chief Executive Officer of Zilla Parishad and other senior officers of State Government look after the development and

regulatory functions in the district. At all tahsil level the Tahsildar, Block Development Officer, Judicial Magistrate, Deputy Engineers and other officers look after their respective departments for development and regulatory functions.

1.13 Topography & Geography

The physical settings of Beed district shows a contrast of immense dimensions and reveals a variety of landscapes influenced by relief, climate and vegetation.The district can be divided into three broad physiographic divisions viz., the low lying northern division forming a part of the Godavari valley, the higher part in the south forming part of the Balaghat plateau and a third low lying undulating area south-west and west of the highland Beed comprising almost the whole of the Ashti tahsil lying mostly in the Sina basin.

All the streams of the district drain into one of the three principal rivers viz., the Godavari, the Manjra and the Sina which run along the northern, southern and south-eastern boundaries of the district.

Beed District is located between 18.26º to 19.26º North latitude and 74.54º to 76.57º East longitudes. It is bound by Aurangabad and Jalna Districts to the North; by Parbhani and Latur to the East; by Osmanabad and Ahmadnagar Districts to the South; and by Ahmadnagar district to the West. Balaghat Hill ranges run through the district; these hill ranges are about 2000 to 2200 feet above the sea level. The Northern part of the district falls under the Godavari Valley, while the Southern part falls under the Manjra river valley.

The total geographical area of the district is 10615 sq.kms; which form 0.44% of the total geographical area of the State of Maharashtra. Of this total area 235 sq.km (2.20%) is urban area, while 10380 sq.km. (97.8%) is rural area.

The district can be divided into three broad physiographic divisions viz., the low lying northern division forming a part of the Godavari valley which may be described as lowland Beed, the higher part in the south forming part of the Balaghat plateau which may be described as the highland Beed and a third low lying undulating area south-west and west of the highland Beed comprising almost the whole of the Ashti tahsil lying mostly in the Sina basin. All the streams of the district drain into one of the three principal rivers viz., the Godavari, the Manjra and the Sina which run along the northern, southern and south-eastern boundaries of the district.

1.14 Geomorphology and Soil Types

The district can be broadly divided into 3 physiographic units namely; Lowland Beed, Highland Beed and Sina basin.

Lowland Beed is the low lying northern part comprising a part of Godavari valley and is also

known as Gangathari. It has a general elevation rangiong from 400 metre above mean sea level (m amsl) in the east to 500 m amsl in the west with number of residual hills reaching upto 600 m amsl. Highland Beed occupies the southern part forming a part of Balaghat Plateau. This dissected series of hills extending from west to east divides the district into two parts. Sina basin is low lying undulating area southwest and west of Highland Beed comprising almost whole of Ashti taluka. It is interspersed with many low lying residual hills. The district is drained by Godavari, Manjra and Sina rivers and their tributaries. Godavari River flows from west to east along the northern boundary of the district. Manjra River starts from the mountains of Patoda taluka and flows west to east forming the southern boundary of the district. Sina River flows along the south-western boundary of the district.

In the district, rocky and thin layered soils are observed in major part of the district except on the banks of Godavari and Sindphana Rivers, where dark brown to black and clayey loamy to loamy soils are observed. The nutrient levels in almost all the soils are low.

1.15 Ground Water Scenario

1.15.1 Hydrogeology

The major part of the district is covered by Basaltic flows commonly known as Deccan Traps of Upper Cretaceous-Lower Eocene age. Alluvial deposits of Recent to Sub-Recent age are observed along the river courses of Godavari and Sindphana. A map depicting the hydrogeological features is shown in Figure 1.4

1.15.2 Hard Rock Areas

1.15.3 Deccan Trap Basalt

The Deccan Trap includes several flows of Basalt which are supposed to have extruded from fissure volcanoes. Ground water in Deccan Trap Basalt occurs mostly in the upper weathered and fractured parts down to 20-25 m depth. At places potential zones are encountered at deeper levels in the form of fractures and inter-flow zones. The upper weathered and fractured parts form phreatic aquifer and ground water occurs under water table (unconfined) conditions. This aquifer is tapped by mainly dugwells in the depth range of 3.00 to 29.60 m bgl and their yield ranges between 5700 and 72900 lph. At deeper levels, the ground water occurs under semi-confined conditions. These are tapped by Dug-cum-Borewell (DCB) ranging in depth from 11 to 50 m bgl. The confined aquifers in Basalt are encountered at depth of more than 40 to 50 m and are tapped by borewells ranging in depth from 40 to 100 m bgl. Borewells drilled down to 70 m depth, tapping weathered and vesicular basalt are found to yield 500 to 3000 lph. As per Ground Water Exploration data deeper potential aquifers below 100 m bgl have been observed in Gevrai and Ashti talukas.

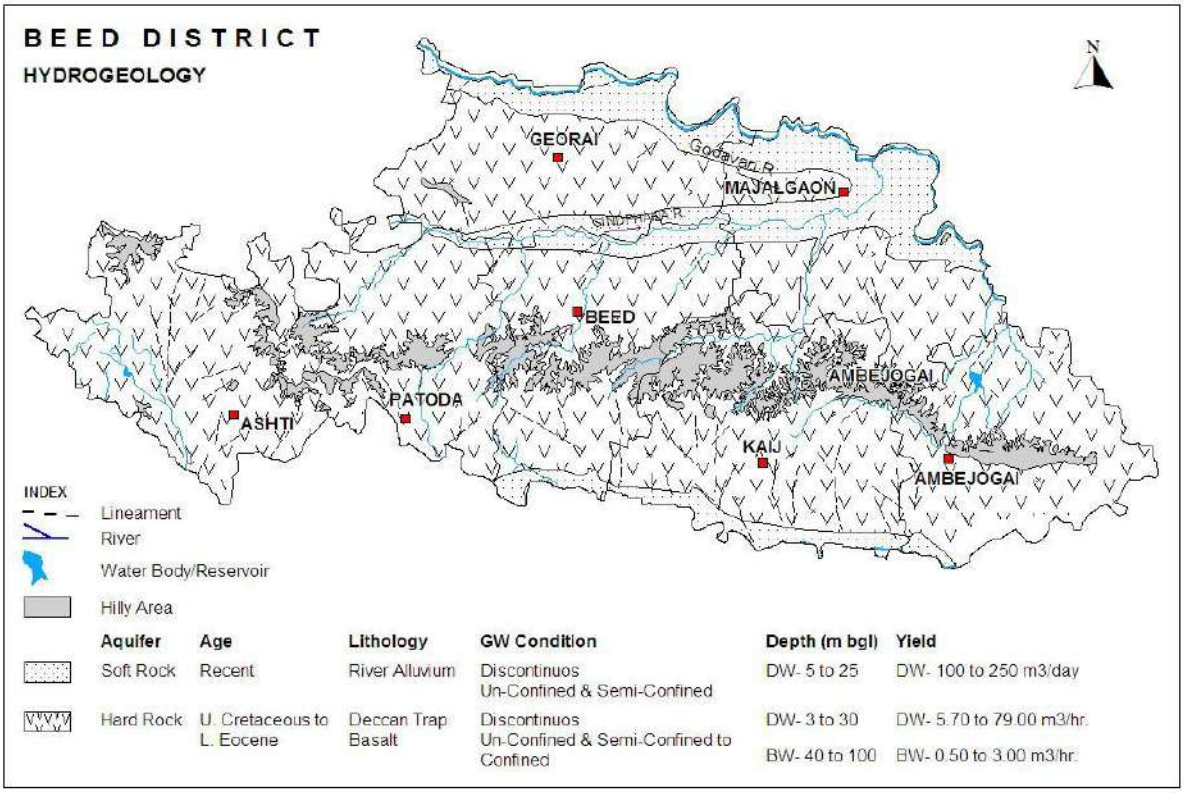


Figure 1.4: Hydrogeology

1.15.4 Soft Rock Areas

1.15.5 Alluvium

Alluvial deposits occur in long narrow basin along Godavari and the Sindphana rivers. About a 10% area of district is occupied by Alluvium. It consists of sand, gravels and boulders with intercalations of clays and silt. The beds of sand and gravels are discontinuous and lenticular and pinch out laterally within short distance. Ground water occurs under phreatic and semi-confined conditions in inter granular pore spaces of gravel and sand. This aquifer is tapped mainly by dugwells ranging in depth 5 to 25 m bgl with 2 to 3 m diameter and the yield varies from 100 to 250 m^3/day.

1.16 River System (Drainage Pattern)

Godavari river is the main river which flows through the Northern part of the district. Manjra, Sindphana, Bendsura and Wan are other rivers in the district. There are smaller rivers in the district, which go dry during summer season.

1.17 Irrigation

Beed district blessed with two major irrigation projects named Majalgaon & Manjara. Majalgaon project situated near majalgaon taluka but the command area comes in Majalgaon & Ambajogai tahsil. The total command area under these major projects is 81832 Ha. There are also 16 medium projects and 1469 small projects in the district and the total command area under these medium and small projects is 55164 Ha. The total command area developed due to all these Major, Medium and Small projects is 166911 Ha. Out of which 133368 Ha. area comes under irrigation. This area is 3.63% of the total area under cultivation in Beed district.

1.17.1 Jayakwadi Project

The work of this project was started in 1965 and was completed in 1985. The irrigation through right bank canal of Jayakwadi project in Beed district is 38260 Ha.

1.17.2 Majalgaon Project

The work of Majalgaon project (Jayakwadi Stage II) was started in 1977 and completed in 1986. Right bank canal of this project is passing in Beed district and irrigation is 27717 ha. The capacity of this project is 312 mm3.

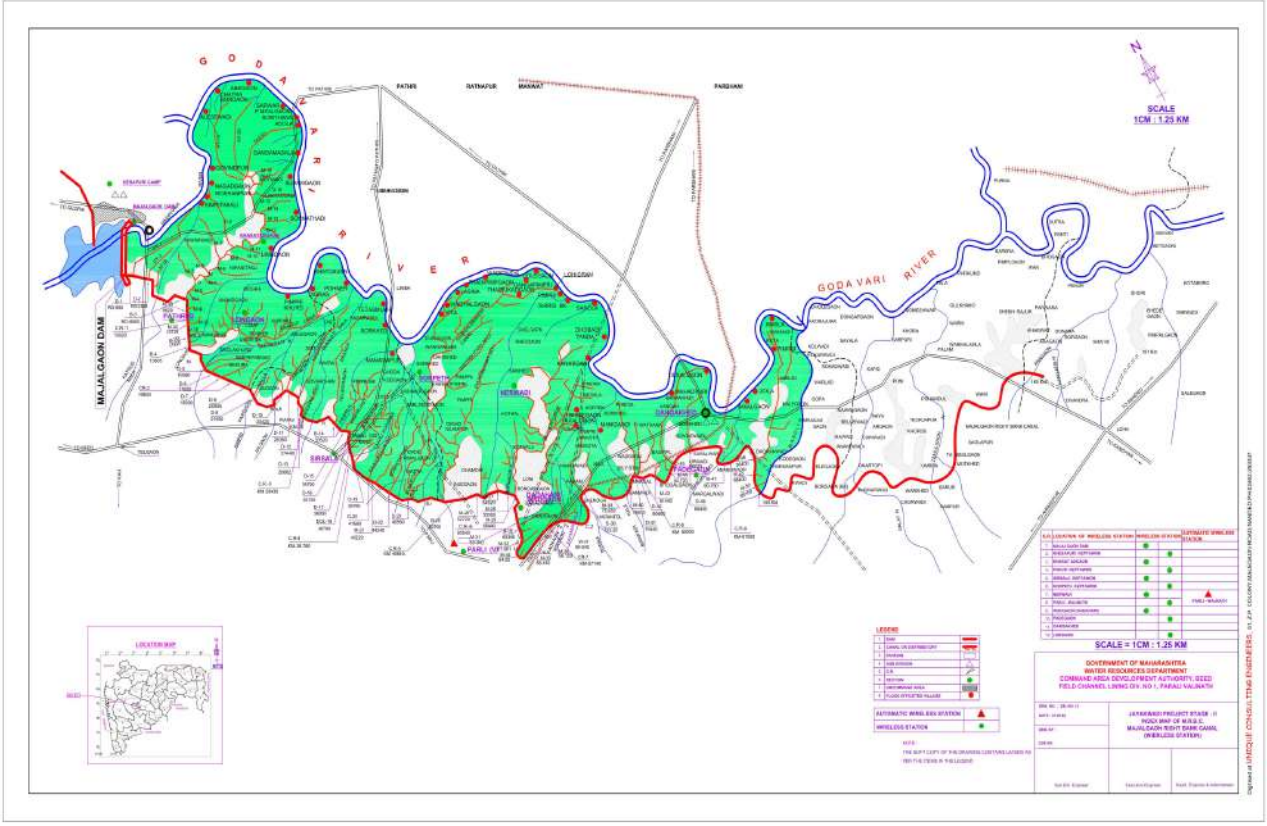


Figure 1.5 : Index Map of Majalgaon Right Bank Canal (Jayakwadi Project Stage II)

1.17.3 Manjara Project

The work of Manjara project was started in 1975. The work of dam was completed in 1980 and canal works were completed in 1984. The storage of this project is 173 mm3. The left bank canal of this project irrigates 3973 Ha. In Beed district.

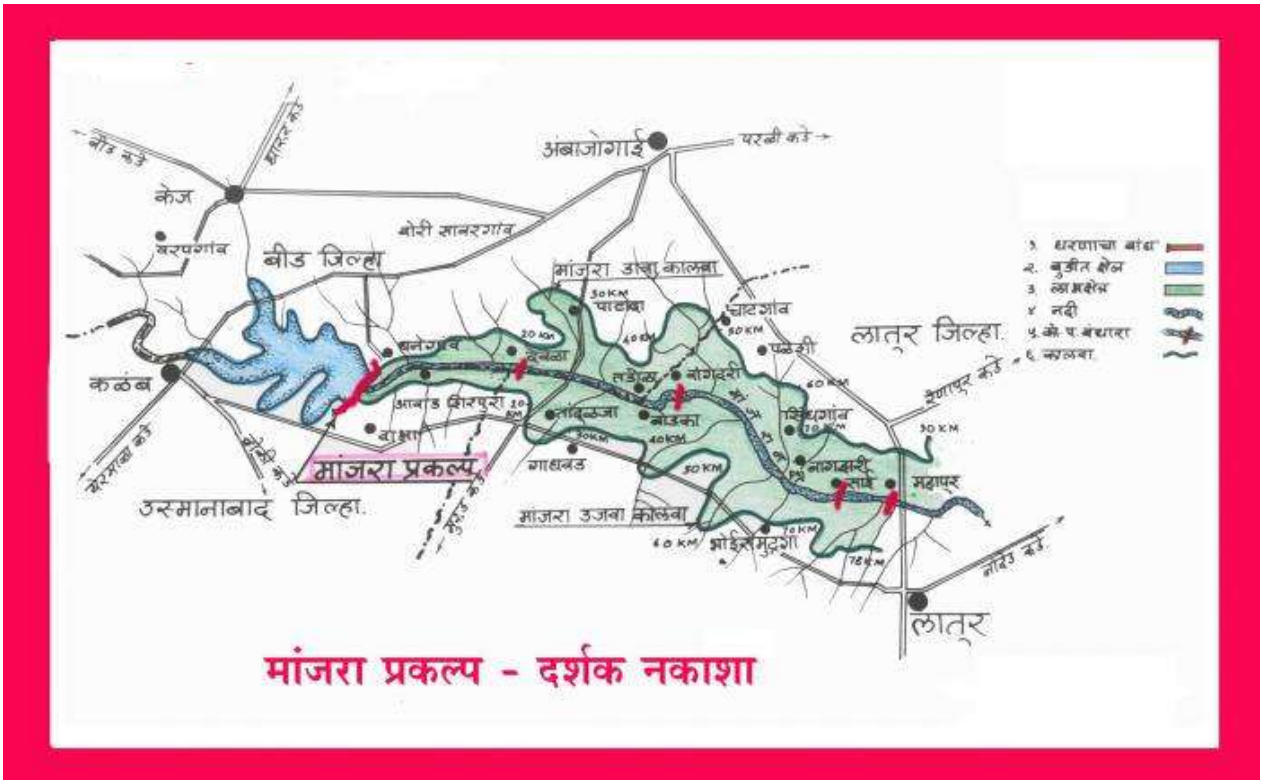


Figure 1.6 : Index Map of Manjara Project

1.17.4 Major Dams

Sr. No.	Name of Project	Taluka	Storage	Irrigation
1	Jayakwadi Project	Paithan (Aurangabad)	2170.93 mm3	38260 Ha.
2	Majalgaon Project	Majalgaon	312 mm3	27717 Ha.
3	Manjara Project	Kaij	176.96 mm3	3973 Ha.

(Source: Irrigation Dept. Beed)

1.17.5 Medium Dams

Sr. No.	Name of Project	Taluka	Storage	Irrigation
1	Bindusara	Beed	7.106 mm3	1288 Ha.
2	Sindphana	Shirur	7.356 mm3	1782 Ha.
3	Belpara	Shirur	5.820 mm3	1093 Ha.
4	Mahasangvi	Patoda	5.888 mm3	1943 Ha.
5	Van	Parli	21.912 mm3	5262 Ha.
6	Borna	Parli	8.977 mm3	1376 Ha.
7	Bodhegaon	Parli	3.650 mm3	990 Ha.
8	Saraswati	Wadwani	6.207 mm3	1230 Ha.
9	Kundlika	Wadwani	37.692 mm3	4440 Ha.
10	Waghe Babulgaon	Kaij	3.742 mm3	690 Ha.
11	Mehekari	Ashti	16.97 mm3	4048 Ha.
12	Kada	Ashti	6.38 mm3	1084 Ha.
13	Kadi	Ashti	8.55 mm3	1214 Ha.
14	Ruti	Ashti	6.57 mm3	1862 Ha.
15	Talwada	Ashti	3.23 mm3	668 Ha.
16	Kambli	Ashti	3.10 mm3	972 Ha.

(Source: Irrigation Dept. Beed)

1.18 Land Use & Land Cover

Sr. No.	Standard Land Use Classification	Sub Category	No./Ac/Ha/Lakhs
1	Urban or Built-up Land (Total Area 158.31 Sq.Km.)	Residential Houses	5.21 Lakhs
		Commercial Buildings	NA
		Schools	Urban & Rural 4201
		Hospitals	375
		Government Buildings	NA
		Industries	152
2	Rural Land		10812.39 Sq.Km.
3	Agricultural Land (Total Area 762826 Ha)	Cropland	395000 Ha
		Net Area Sown	368000 Ha
		Grassland (Grazing/Non Grazing)	31000 Ha
4	Forest Land	----------	28000 Ha
5	Water (% of area covered 3.62%)	River	4
		Lakes (Artificial/Natural)	5
		Ponds (Artificial/Natural)	524
		Dam / Reservoir	18
		Canals	NA
		Well	34730
		Minor Irrigation Projects	186
		K.T. Wears	40
		Tubewells	615
6	Wetland	----------	153488 Ha
7	Barren and Wasteland (Total Area 101000 Ha)	Uncultivable waste Land	21000 Ha
		Barren Land	78500 Ha
		Beaches	Nil

(Source: DSA Beed 2017)

1.19 Forest

During the year 2014-15, an estimated 259.66 Sq. Km of area was under forest which constituted 2.43 % of the total area. Forest resources contribute significantly to the economy of the district.

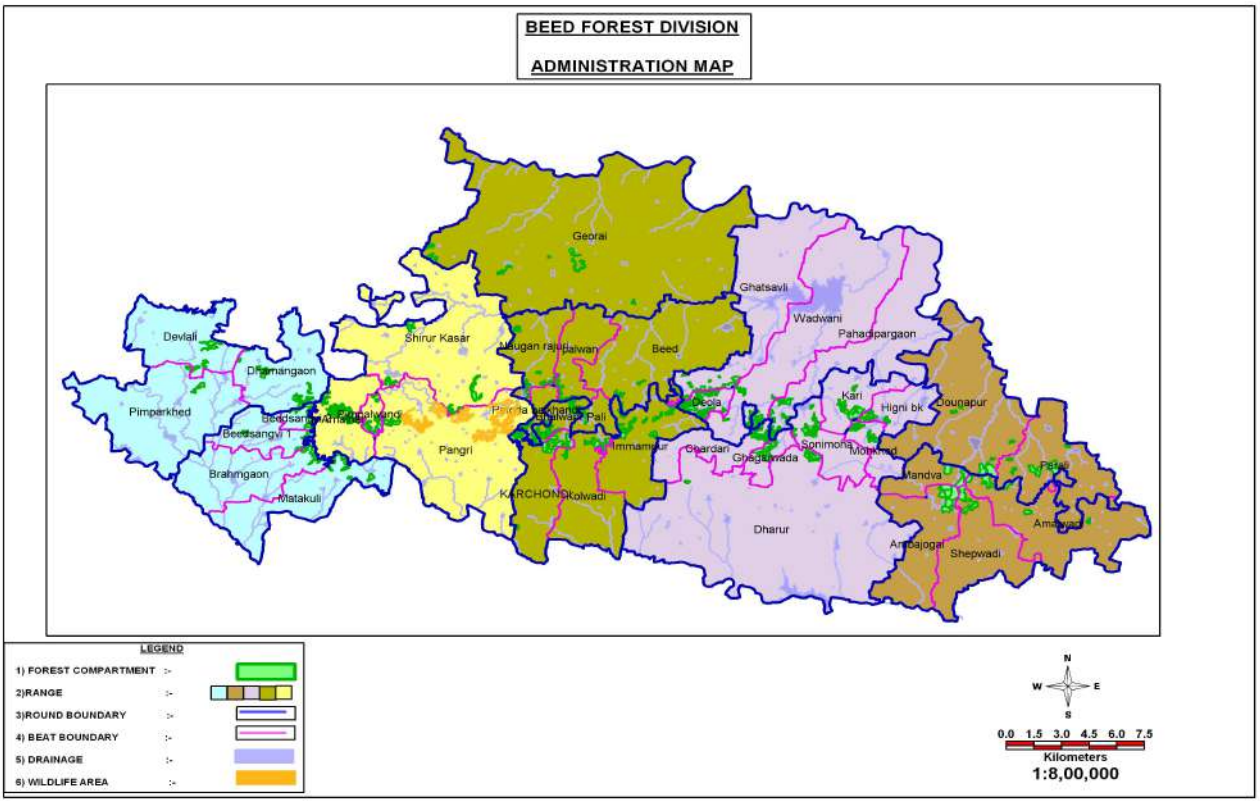


Figure 1.7 : Forest cover of Beed

1.20 Demography & Socio-Economic Profile:

1.20.1 Population

The population of Beed Districtwas 25.86 lakhs as per Census 2011 with a decadal growth rate of 19.65 per cent. It covers a geographical area of 10,963 sq. km. As per census 2001, the SC population shares 13.01% while ST population shares merely 1.12% of the total population of district as compared to the state average of 10.2% and 8.9% respectively.

Beed district has 19.9 percent of urban population. The district sex ratio 916 is lower compared to the states sex ratio 929. Literacy rate of Beed district is 77.0 percent and male and females literacy rate is reported 85.6 percent and 67.8 percent respectively. There are 7 villages having population 10,000 and above. There are 11 uninhabited villages in the district. Beed tahsil has the highest (224) number of villages and Wadwanitahsil has the lowest (45) number of villages in the district. Patoda village in Patoda C.D Block has largest area (5904.73 Hectares) and Dahiwandi village in Beed C.D Block has smallest area (74.80 Hectares) among all villages of the district.

The economy of the district is primarly depend on agriculture. Patoda village in Patoda C.D. Block is the most populated (14,476) and KedarSangvi (ManjlegaonC.D.Block) village is the least populated (7 persons).

1.20.2 Sex ratio

Sex Ratio of Beed is 916 against 1000 men. In rural it is 912 women against 1000 men and 933 women against 1000 men in Urban Area. The district sex ratio 916 is lower compared to the states sex ratio 929.

1.20.3 Blockwise Area, Population & Literacy Population

Sr. no	Name of Block	Area in Square Kilometer	Population(Total)			Population (0-6)		
			Male	Female	Total	Male	Female	Total
1.	**Beed**	1571.02	176132	158354	334486	27735	19800	47535
2.	**Patoda**	869.79	65854	59227	125081	8824	7007	15831
3.	**Ashti**	1530.89	126561	117046	243607	16387	13638	30025
4.	**Shirur**	749.71	67626	60957	128583	9220	7185	16405
5.	**Majalgaon**	952.41	107291	98437	205728	16882	13449	30331
6.	**Gevrai**	1512.16	159044	146004	305048	25213	19893	45106
7.	**Dharur**	579.91	53285	48408	101693	7778	6340	14118
8.	**Wadvani**	403.08	45866	41819	87685	7122	5587	12709
9.	**Ambajogai**	934.82	102852	95130	197982	14224	11985	26209
10.	**Kaij**	1099.19	111999	101129	213128	16007	12668	28675
11.	**Parli**	759.57	102446	93787	196233	15305	12335	27640

(Source: Census of India 2011)

Sr. no	Name of Block	Area in Square Kilometer	S.C. Population			S.T. Population		
			Male	Female	Total	Male	Female	Total
1.	**Beed**	1571.02	23024	21833	44857	1638	1580	3218
2.	**Patoda**	869.79	6370	5961	12331	573	557	1130
3.	**Ashti**	1530.89	12691	12147	24838	2691	2540	5231
4.	**Shirur**	749.71	5378	5218	10596	720	625	1345
5.	**Majalgaon**	952.41	17333	16296	33629	1113	1037	2150
6.	**Gevrai**	1512.16	19386	18673	38059	1854	1802	3656
7.	**Dharur**	579.91	8639	8265	16904	1708	1614	3322
8.	**Wadvani**	403.08	6368	6143	21511	407	390	797
9.	**Ambajogai**	934.82	16632	15791	32423	741	695	1436
10.	**Kaij**	1099.19	16983	16008	32991	1503	1458	2961
11.	**Parli**	759.57	16679	15616	32295	1070	1054	2124

(Source: Census of India 2011)

Sr. no	Name of Block	Literate Population		
		Male	Female	Total
1.	**Beed**	129041	93029	222070
2.	**Patoda**	48038	32720	80758
3.	**Ashti**	93322	68475	161797
4.	**Shirur**	48624	33406	82030
5.	**Majalgaon**	74668	53783	128451
6.	**Gevrai**	110543	78730	189273
7.	**Dharur**	3 7140	25885	63025
8.	**Wadvani**	32048	22454	54502
9.	**Ambajogai**	77275	59228	136503
10.	**Kaij**	81732	58498	140230
11.	**Parli**	73818	54095	127913

(Source: Census of India 2011)

1.20.4 Education

As per the Census 2011, the literacy rate in Beed district is 73.53%, which is lower than the state as a whole (76.63%). The comparison among the male and female literacy rate shows that the percentage of male literates is high (83.99%) in comparison to the percentage of female literates (62.29%).

Block Name	Primary School	Middle School	Higher Secondary School	Colleges	Ashram Shala	Total
Beed	670	130	55	28	17	**900**
Patoda	247	41	17	05	06	**316**
Ashti	360	85	33	12	06	**496**
Shirur	244	39	21	07	01	**312**
Majalgaon	302	42	13	05	05	**367**
Gevrai	415	59	25	07	07	**513**
Dharur	173	24	09	03	03	**212**
Wadvani	125	16	09	02	05	**157**
Ambajogai	317	75	25	28	10	**455**
Kaij	353	80	28	11	16	**488**
Parli	299	66	24	09	10	**408**
Grand Total	**3505**	**657**	**259**	**117**	**86**	**4624**

(Source: DSA Beed 2017)

1.20.5 Electrification

Parali-Waijanath is the atomic energy project located in the district. There is 100 per cent electrification achieved in the district by the end of March 2009. Out of total electricity consumption, 32.09 per cent electricity is used for agricultural purpose.

1.21 Soil

Soil is the most important feature of physiography the formation of which largely depends upon the topography rock types and drainage. The cropping pattern in the area is governed by the thickness of soil mantle, its texture and constancy. The main factor that has influenced the development of soils in Beed district is the undulating and hilly topography. The soils of varying depth are found throughout the district. The deep soils usually lie in the river valleys. The district is covered with the Deccan trap soil.The following are some of the important varieties of soil in this district:

1.21.1 Shallow Soils: The shallow soils of Beed district (Georai and Ashti taluka) have dark brown to dark yellowish brown colour, single grain to blocky structure and sandy loam to loamy texture. The PH of the soil is from 8.3 to 8.5 with total soluble salts of 0.2 to 0.3 per cent. The percentage of nutritious contents in shallow soils is very low. These soils respond to all kinds of fertilizers.

1.21.2 Moderately deep Soils: The moderately deep soils are found in Georai, Patoda and Ashti taluka)and have varying colours, structure and texture. The colour of the soil is dark brown, dark reddish brown or dark grey brown. The structure varies from single grain to blocky while texture varies from sandy loam to clay. The PH varies from 7.5 to 8.5 and total soluble salts from 0.2 to 0.4 per cent. Like shallow soils, these soils also are of inferior quality due to the lack of nutritious contents in them. Generally, these soils respond to all kinds of fertilizers.

1.21.3 Medium deep Soils: The medium deep soil is found in Ashti and Patoda taluka. It has dark brown or black colour, and is granular or blocky in structure and sandy loam to clayey in texture. The PH of this soil varies from 8.2 to 8.7 and total soluble salts from 0.2 to 0.3 per cent. The nutritious elements in the soil also vary considerably. This type of soil responds favourably to the nitrogenous and phosphatic fertilizers.

1.21.4 Deep Soils: These soils are found in Georai and Mominabad. Their colour changes from dark brown to black and so also the texture changes from clay loam to clayey. The PH of these soils vary from 8.5 to 8.9 and total soluble salts from 0.4 to 2 per cent. The high PH and the total soluble salts show that the soils have developed the saline and alkaline conditions. This soil responds to nitrogenous and phosphatic fertilizers.

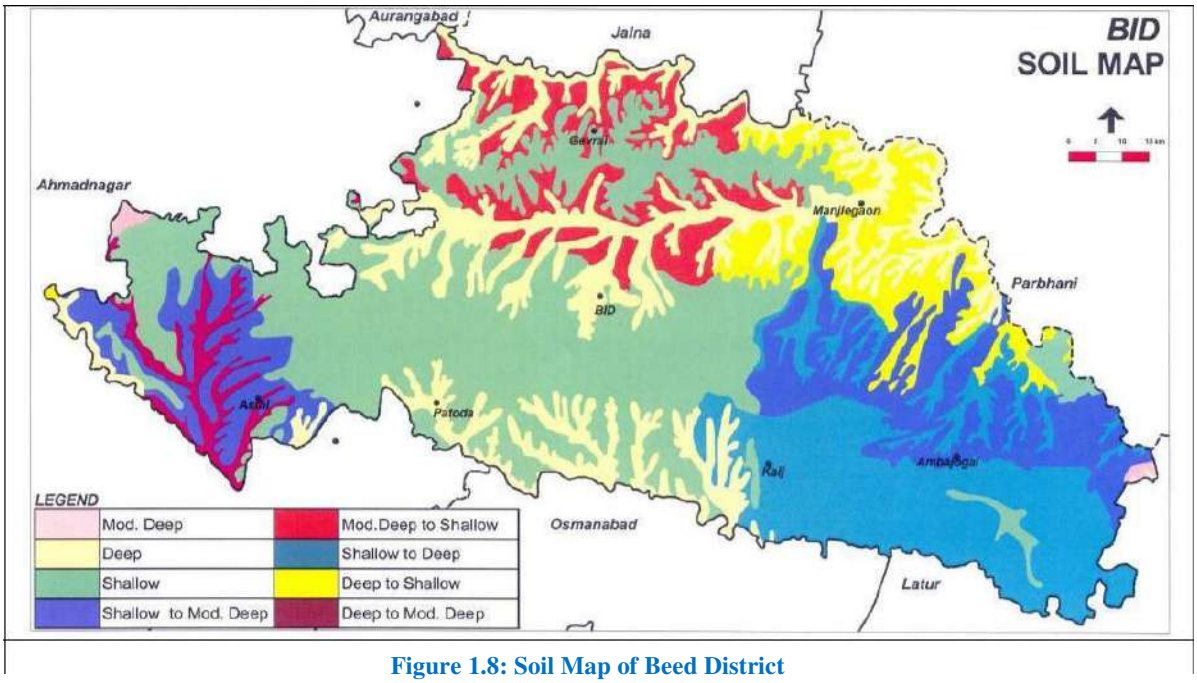


Figure 1.8: Soil Map of Beed District

1.22 Climate & Rainfall

The climate of this district is on the whole dry except in the south-west monsoon season. The year may be divided into four seasons. The cold season from December to February is followed by the hot season from March to May. The period from June to September is the south-west monsoon season while October and November constitute the post-monsoon season.

The average annual rainfall for the district is 750.1 mm. The rainfall in the district increases from the west to the east, varying from 665.3 mmat Ashti near the western border to 850.6 mm at Mominabad near the eastern border. About 80 per cent of the annual rainfall is received in the south-west monsoon period. September is the rainiest month. The variation in the rainfall from year to year is fairly large.

The cold weather commences towards the end of November when temperatures begin to fall. December is the coldest month, with the mean daily minimum temperature at about 12°C and the mean daily maximum at about 29°C. In the cold season the district is sometimes affected by cold waves in association with the passage eastwards of western disturbances across north India. On such occasions the minimum temperatures may drop to about 3°C or 4°C. The rapid rise in temperatures starts only by about the beginning of March.

May is the hottest month with the mean daily maximum temperature at about 42°C. On individual days the day temperature may be as high as 46°C. With the advance of the south-west monsoon into the district by about the second week of June the temperatures fall appreciably and the weather is pleasant throughout the south-west monsoon season. By about the first week of October the monsoon withdraws and the day temperatures increase slightly and a secondary maximum is reached in October. Thereafter the temperatures begin to decrease gradually.

The relative humidity is high during the south-west monsoon season. After September the humidity decrease gradually and in the cold and summer seasons the air is dry, particularly in the afternoons when relative humidity may be less than 30 per cent.

Winds are moderate in strength in the latter half of summer and in the south-west monsoon period and light in the rest of the year. During the south-west monsoon season, winds blow predominantly from directions between south-west and north-west. In the post-monsoon and winter months winds are from directions between east and north.

1.23 Economy

The area of Beed district is 10,615 sq. km. Out of the total area, Cultivable area occupies major portion of the land and covers 95.41% of the total land area. The forest area covers 2.14% which is quite less while other area occupies 2.48 % of land.

1.24 District Income

Govt. of Maharashtra has been publishing Gross and Net- District Domestic Products of all districts in the State of Maharashtra from time to time. The following table shows sector wise income (gross) of Beed district for the year 2010-11, at current (latest year prices). It is obvious from this table that the proposition of primary sector income in the total income of the district is very high at 35%. On the other hand, the proportion of secondary sector income to total income is only 15% in Beed. This explains the weakness of the industrial sector of Beed district. The tertiary sector contributes 50% to the district income of Beed district.

Table:1.1: Gross District Domestic Product, at current prices for the year 2011-12 Beed District

Sr. No	Sector	Amount	% to total	State GSDP%
1	**Primary sector**	429833	32	
2	**Secondary sector**	177706	13	
3	**Tertiary sector**	732874	55	
	Total	1340263	100.0	1.13
4	**Per capita District Income Rs.**	55139		
5	**Total state income Rs. Lakh**	108275133		
6	**Per Capita State Income Rs.**	95339		
7	**District Income as % of State Income**	1.24		
8	**Dist. Per capita income as % of State per capita Income**	57.8		
9	**Human Development Index (HDI)**	0.47 rank (18th)	0.58	State average
10	**Human Poverty Index (HPI)**	21.21% rank (24)	16.22%	State average

(Source: Ministry of MSME, GOI)

The proportion of rural population of Beed district to total population is 82%, while the urban population is just 18% according to the census report of 2012. Hence, 82% of the rural population is dependent on primary sector, which produces about 55% of district income. This clearly explains a heavy dependence of rural population on agriculture & allied activities. This large proportion of population & labour force needs to be diverted to other non-farm activities in this district, through larger investments. This strategy has to be followed for a fairly long period of time.

(I) Per Capita Income

The per capita income of a region reflects upon the standard of living of the common people residing in that region. The per capita income of Beed district, in 2011-12, at current prices, was observed to be Rs. 55139/- as against the state average of Rs. 95339/-. In other words, the per

capita income of Beed district is about 57.9% of state per capita income, indicating a low standard of living of the masses in Beed district.

(II) Human Development Index

Recently, the United Nations Development Programme (UNDP) has evolved a new concept of Human Development Index (HDI), which is much more comprehensive than the per capita income. The HDI is the average value of three major variables, viz. (1) per capita income ii) Education and, iii) Health.

The HDI value expresses the quality of life of the common people in a region. The Govt. of Maharashtra has published data relating to the HDI values of all the 35 districts in the state. According to this report, Beed district has HDI value of only 0.47 and it ranks 18th among 35 districts. The average HDI value for the state is 0.58. Gadchiroli occupies bottom position with the HDI value of 0.21, while Mumbai tops the list with the HDI value of 1.0.

Recently, the Govt. of Maharashtra has established "Maharashtra Human Development Mission" with a view to improve the HDI values of those districts which are at the bottom of the table.

(III) Human Poverty Index: (HPI1)

Human Poverty Index also indicates the quality of life of the common people in a given region. L It includes variables like, percentage of population expected to survive upto the age of 40; rate of illiteracy; percentage of population served with safe drinking water and percentage of malnourished children.

i) The value of HPI for Beed district was estimated at 21.21% and ranked 24th among 30 districts in the state. The state HPI value was 16.22% (on 0-100 scale). This amply proves a very low quality of Human Development in Beed district. This needs to be improved urgently.

1.25 Agriculture

Beed primarily has an agro-economy. About 80% of the district population depends upon agriculture for their livelihood. There are two major agricultural seasons in the district, kharif and Rabi. Sorghum is the main crop in the district and is harvested in both cropping seasons. The Sorghum grown in Gangthadi in the Rabi season is known as the Takli Jwari.

Table 1.2 : Seasonal Cropping Pattern

Season	Main Crops
Kharif	Sorghum, Cotton, Spiked millet, Green gram, Red gram and groundnut
Rabi	Sorghum, Wheat, Green chickpea and Safflower

Sugarcane is an important irrigated crop and credit to the sugar factories, the district is steadily increasing its area of cultivation. During its harvesting season, many famers migrate to other talukas within the district or the neighbouring districts for cutting sugarcane.

In addition, sunflower, grapes, mangoes and watermelons are grown here. KalaPahad from Neknur and Pevandi from the Ambejogai taluka are famous varieties of mangoes in the State.

1.26 Industrial Profile

Though the district is considered industrially backward, the people of the district are engaged in a variety of business. There are several sugar factories, spinning mills and a thermal Power Station in the district. There are also around 36 ginning factories in the district, as cotton is one of the major crops cultivated in Beed district.

Only one industrial estate exists and that is in the city of Beed. A thermal power plant was established at Parli in 1970. In 1995, this plant was awarded the Vanashri award instituted by the State Government for its afforestation drive.

Parli has a factory for electric lamps and other electric components as also oil mills and cotton mills. Beed and Wadavni have handloom factories. There are oil mills also in Ambejogai and Beed. A tannery, under the patronage of the Marathwada Vikas Mahamandal is being established at Beed. Beed is famous for Chaagal, which are budhale made from a type of

leather. Amalner in Patoda taluka is famous for its brass and copper vessels. There are many dairies located in the district and the milk and the dairy industry is growing at a fast rate. The fishery industry is also fairly growing industry in the district.

Masonry stone being available aplenty in the district has resulted in related business and professional opportunities.

Though gradual industrial progress is being made, agriculture remains the main occupation of the people of the district.

Table 1.3: Industries at a glance

Sl. No.	Head	Unit	Particulars
1	REGISTERED INDUSTRIAL UNIT	NOS	2143
2	TOTAL INDUSTRIAL UNIT	NOS	2143
3	REGISTERED MEDIUM & LARGE UNIT	NOS	20
4	ESTIMATED AVG. NO. OF DAILY WORKER EMPLOYED IN SMALL SCALE INDUSTRIES	NOS	20885
5	EMPLOYMENT IN LARGE AND MEDIUM INDUSTRIES	NOS	5835
6	NO. OF INDUSTRIAL AREA	NOS	6+2
7	TURNOVER OF SMALL SCALE IND.	IN LACS	186434
8	TURNOVER OF MEDIUM & LARGE SCALE INDUSTRIES	IN LACS	15146

(Source: Ministry of MSME, GOI)

Table 1.4: Details of Existing Micro & Small Enterprises and Artisan units in the district

NIC CODE NO.	TYPE OF INDUSTRY	NUMBER OF UNITS	INVESTMENT (Lakh Rs.)	EMPLOYMENT
20	Agro based	284	9292.00	4993
22	Soda water	-	-	-
23	Cotton textile	113	5462.00	2251
24	Woollen, silk & artificial Thread based clothes.	-	-	-
25	Jute & jute based	-	-	-
26	Ready-made garments & embroidery	57	169.00	231
27	Wood/wooden based furniture	101	414.00	740
28	Paper & Paper products	36	125.00	122
29	Leather based	38	191.00	238
31	Chemical/Chemical based	44	662.00	400
30	Rubber, Plastic & petro based	47	74.00	345
32	Mineral based	215	1193.00	2107
33	Metal based (Steel Fab.)	408	2581.00	2430
35	Engineering units	-	-	-
36	Electrical machinery and transport equipment	40	92.00	92
97	Repairing & servicing	376	2731.00	2340
01	Others	384	4666.00	4596
	Total	**2143**	**27652**	**20885**

(Source: Ministry of MSME, GOI)

Large Scale Industries: List of the units in Beed & Near By Area ELP- D (List of large Scale Industrial Enterprises as per IEM Data)

Sr. No.	Name of the Unit	Location of the Unit	Product	Investment In Cr.	Employment
1	Ambajogai Sahakari Sakhar Karkhana Ltd.	Ambajogai	Sugar	22.75	485
2	Vaijinath Sahakari Sakhar karkhana Ltd.	Pangri,Tq.parli	Sugar	58.60	593
3	Jai Bhavani Sahakari Sakhar Karkhana Ltd.	Gadi,Geori	Sugar	48.81	618
4	Gajanan Sahakari Sakhar Karkhana Ltd.	Sonaji Nagar. Beed	Sugar	16.45	489
5	Padamshri Vithalrao Vikhe Sahakari Sakhar Karkhana Ltd	A/p.Kothi,Tq.kaij	Sugar	29.54	389
6	Kada Sahakari Sakhar Karkhana Ltd.	A/p.Kada, Tq.Ashti	Sugar	14.69	554
7	Ambajogai Sahakari Sakhar Karkhana Ltd.	Ambajogai	Indl. Alcohol	4.72	20
8	Vaijinath Sahakari Sakhar karkhana Ltd.	Pangri,Tq.parli	Indl. Alcohol	10.35	25
9	Jai Bhavani Sahakari Sakhar Karkhana Ltd.	Gadi,Geori	Indl. Alcohol	8.09	25
10	Sant.Jagmitra Sah.Soot Girni Ltd.	Tokwadi,Tq.Parli	Cotton spinning	20.91	460
11	Jai Mahesh Sugar Ind.Ltd.	Pawar Wadi,Tq.Parli	Sugar	14.00	140
12	Majalgaon Sahakari Sakhar Karkhana Ltd.	Telgaon,Majalgaon	Sugar	60.00	793
13	Mauli Sah.Soot Girni Ltd.	GeoraiTq.Georai	Cotton Yarn	8.00	75
14	Yogeshwari Co-Op.Spinning mill	HoalTq.Kaij	Cotton Yarn	8.00	98
15	Yogeshwari Co-Op.Spinning mill	Ambora,Ashti	Nitric Acid	3.00	67
16	Pawan Protein India ltd.	Apt.Parali	Edible Oil	4.53	296
17	Gajanan Extraction	Apt.Parali	Crude Oil	2.22	290
18	Marathwada paper mill	Rohital Tq.Georai	Paper Board	3.28	75
19	Marathwada paper mill	Rohital Tq.Georai	Uncoated craft paper	4.69	168
20	The India Cement Ltd.	Rohital Tq.Georai	Port land cement	283.00	175

(Source: Ministry of MSME, GOI)

Mega Project in the District:

There is One Thermal Power project at Parli (Vaijnath), Dist. Beed.

Major Exportable Item:

There no exportable items manufactured in the district.

Growth Trend:

There is a growth trained in Agro based industries in area some units are also engaged in manufacturing of Bricks.

Vendorisation / Ancillarisation of the Industry:

In an around Beed district Sugar mill, Breweries, Cotton Yarn & Spinning Edible & Crude Oil & Paper bard/Craft paper mill etc. are working in the region. There is a possibility of developing vendors to supply the various items related to above industries.

1.27 Animal Husbandry

According to the animal census-2012 there were; 5,82,080 lakh Cows and 2,40,284 lakh Buffaloes in the district. Dairy farming is the significant supplementary source of income generation available to the farmers of the district. In other animals; Bulls 2,65,534 lakh, 66047 thousand Sheeps and Goats 3,35,843 lakh, also there were 9,56,292 lakh birds in different poultry farm of the district.

1.28 Health Services

Table 1.5: Following table shows Govt. Health Facilities available in Beed District

District: Beed									**Reference Year 2014-15**
Sr. No.	**Taluka**	**Hospitals**	**Special Hospitals (Cancer, TB etc.)**	**Dispensaries**	**Maternity Homes**	**Primary Health Centres**	**Sub Centres**	**Doctors**	**Nurses**
1	**Ashti**	1	0	3	1	5	38	12	31
2	**Patoda**	1	0	3	1	4	20	10	25
3	**Shirur Kasar**	1	0	2	1	2	19	7	16
4	**Gevrai**	1	0	2	1	6	39	22	42
5	**Majalgaon**	2	0	4	2	5	22	15	28
6	**Wadvani**	1	0	2	1	2	11	9	16
7	**Beed**	3	1	4	3	8	40	78	191
8	**Kaij**	2	0	4	2	6	31	29	64
9	**Dharur**	1	0	1	1	2	14	7	13
10	**Parli**	1	0	1	1	5	21	23	48
11	**Ambejogai**	1	1	2	1	5	25	16	36
	Total	**15**	**2**	**28**	**15**	**50**	**280**	**228**	**510**

(Source: District Health Officer, Z.P. Beed)

Table 1.6: Following table shows Private Health Facilities available in Beed District

District: Beed						Reference Year 2014-15
Sr.No.	**Taluka**	**Private Health Facilities (Nos.)**				
		Hospitals	**Special Hospitals (Cancer, TB etc.)**	**Dispensaries**	**Maternity Homes**	**No. of Beds**
1	**Ashti**	30	0	45	30	625
2	**Patoda**	4	0	28	4	41
3	**Shirur Kasar**	2	0	41	22	91
4	**Gevrai**	16	0	5	7	32
5	**Majalgaon**	31	0	5	14	113
6	**Wadvani**	2	0	16	13	60
7	**Beed**	146	0	69	9	539
8	**Kaij**	7	0	21	4	127
9	**Dharur**	7	0	8	5	51
10	**Parli**	14	0	10	3	21
11	**Ambejogai**	8	0	10	2	58
	Total	**267**	**0**	**258**	**113**	**1758**

(Source: District Health Officer, Z.P. Beed)

1.29 Housing Pattern

The houses built in the district are of flat roofs as the rains are not heavy. There are also R.C.C. buildings constructed in this area. In rural areas, mostly the houses are of mud or brick walls. There are also some pucca houses in the rural area.

1.30 Language and Food habits

The dialect spoken in this area is Marathi, Hindi and Banjara. Food habits in the state of Maharashtra include Rice, Dal, Chapatties, vegetables, non-vegetarian items; items of gram flour.

1.31 Festivals

The majority of people in Beed are Hindu, so the traditional Hindu festivals are observed in the region, as Holi, Ganpati Puja, Durga Puja or Dusserah, Deepavali, Bhaiya Dooj, Raksha Bandhan etc. The major festivals are Shivratri, Ganpati puja or Durga Puja, Makar Sankranti and Holi. Some festivals like Eid and Ramzan of minority peoples are celebrated by Muslim community in Beed.

1.32 Major Heritage Site, Historical and Religious Tourist Spots

A brief description of the major tourist destinations is listed below to understand the potential of tourism in Beed.

1) Kankaleshwar Temple:

On the eastern bank of the Bendsura River, in the centre of a lake, stands the temple of Kankaleshwar unrivalled in beauty and magnificence. It is the finest temple in Beed in design and workmanship and its beauty is all the more heightened by virtue of its being in the centre of a manmade pond full of water. There is only one pathway to reach the temple. The Chalukya Emperor Vikaramaditaya VI constructed this temple during 10^{th} and 11^{th} century. The temple is minutely and marvelously carved and depicts Chalukya Hoyisal and Rashtrakut impression. The temple represent ten incarnations (Dus-aavatari) as its pious feature. Several tourists visit this temple with homage and admire it for its sculpture.

2) Yuva Shantivan:

Yuva- Shantivan situated on Beed– Solapur National Highway 211near Bindusara water reservoir is of enormous importance as regards to tourism. The site and its surrounding are positioned with natural beauty giving it highly exquisite significance. The site is developed by forest department and is under its ownership.

3) Mohammad Tuglak Tooth Samadhi, Karzani:

The tomb housing Mohammad Tuglak Tooth is located on a hillock amid natural scenic beauty at karzani, which is about 6 km away from Beed-Solapur National Highway 211. Other historical importance of this tomb lies in the fact that apart from Tuglakabad (Delhi), it is the only monument housing remains of King Mohammad Tuglak in India. The tomb is completely in ruined condition and is under the preview of State Archaeological department.

4) Khajana Bawdi:

Khajana Bawdi is located 6 km away from Beed town on Beed-Solapur National Highway. It is a wonderful and explicit example of hydrological science of middle age period.This well was constructed in the period of Salabat Khan, sardar of Ahmednagar Nizamshahi in the year 1572- 1575 by architect and geologist Raja Bhaskar for the purpose of irrigation. The diameter of the well is 12.60 M and 7.40 M deep. Even today after 435 years, the well is intact and retains water, and irrigates 500 acre of land without consuming any power.

5) Khandoba Temple, Dipmaal Parisar:

The temple of Khandoba is reported to be very old. Some say that it was built by Sultanji Nimbalkar, one of the Jagirdars of Beed, while others attribute it to Mahadaji Sinde. The structural design of the temple is notable for its finish and craftsmanship. It is built in Hemadpantistyle and has two symmetrical and towering dipmals in front, rising to a height of about 70 ft (6 storeys), highest in Maharashtra.The dipmals are ornamented with striking figures of human beings and animals and are octagonal in shape. The temple has verandahs on its four sides with a roof supported on 32 solid pillars. In a niche, in the back wall of the shrine is the idol of Khandoba. Rang- Mahal beside this temple was constructed by Beed‟s subedar Amir Navajang Bahadur in the year 1779 and was used as guesthouse for important people.

6) Shahanshahwali Dargah:

When Emperor Tuglaq shifted his capital from Delhi to Devnagni, many maulaha and saints followed him and their by there are many religious and pilgrimages places in Beed. Khwaja Abul Faiz was one of them and is among one of the renowned saints of Marathwada region. He was basicallyfrom Afghanistan’s kochak village. Considering the popularity and philosophical ideology, he was giventhe title of Shahanshahwali Chisti. On the eastern part of Beed on a hillock his Dargah is built for worship. This Dargah is visited by all religious conviction.

7) Manmathswami, Kapildhar:

The place is known for the samadhi of Manmath Swami held in high esteem by the Lingayats. It is located amidst picturesque surroundings with small waterfalls in front, trickling down from a hill of about 9.5 metres height. The samadhi is housedin a gabhara surmounted by a small but well designed sikhar. The sabhamandap with a homakund in its centre is open on all the sides. Pavilions have been built near the samadhi to accommodate pilgrims. The location is pleasantly cool due to growth of numerous trees, wild flowers and

plants, which thrive due to the proximity of the waterfall. Apart from high daily visitation, about **5**.5 lakh persons visit during Kartik Purnima held in the month of November for two days.

8) Gyaneshwar Mauli, Chakarwadi:

A beautiful temple is built at Chakarwadi at the barial place of great Saint Gyaneshwar Mauli. He was born in Uttreshwar Pimpri and worked for the people there. It is believed that he had the blessings of Lord Shiva and Lord Hanuman. On every Amavashya,large number of people visits this place for his blessing.

9) Yogeshwari Temple:

The temple is built in Hemadpanti style and there is much architectural work of note. It is known for one among three and half Shaktipith in Maharashtra. The temple has witnessed several transformations over time. In one of the inscriptions of the Yadavas, it is mentioned as having three big sikhars. It is probable that the original temple was destroyed. Nagoji Trimal and Samji Bapuji built the present temple, some 250 years ago, on the remains of the original structure. The Yogeshwari relates the purpose or incarnation, which was to destroy the demon Dantasura who was harassing the sages performing yajnyas.

10) Hattikhana:

Jogai Sabhamandap Cave (Hattikhana caves) is located hardly half a kilometer to the north-west of Yogeshwari temple, along the banks of the river Jayanti. The caves are square in shape and are carved deep inside the hill.Herein these caves there are impression of worldrenowned Kailash caves carving style. The entire sculpturing is done on a single rock right from top to bottom. As per one of the script of Dantkuthe, Hattikhana is parental home of Jogaidevi.Herein Hattikhana there are four huge elephants sculpture placed at four corners. Insize these sculptures of elephant imprints the true size of the animal. The size of this sculpture elephant is 23 feet in breadth and 12 feet in length. In the central part there is 30 feet length Nadhimandap. As per the manuscript Lord Shiv"s inhabit in Nandi, therefore Hattikhana is endow with independent mandap wherein the Nandi is sculpture alongwith ornamental carving.

11) Dharur Fort:

The fort is located on the plain of Palghat hills and has a natural protection by valleys around the three sides, while a moat was constructed towards its front side making it very

difficult to conquer. As there happens to be a plain land here, double protection wall was raised for additional security. The main gate of fort which faces towards east is also protected by two massive bastions on either side. A small pathway through this gate leads to an open ground. On right side of the main fort, there are some remains of a structure, which locally is known as the place of a mint, which existed during those times. Next to this, there is a Jama Masjid. Other than this, the fort also contains structural remains of Barud-khana, Water tank, Rang Mahal etc.

12) Parli Vaijnath:

Parli is well-known for the shrine of Vaijanath containing 5thof the famous twelve jyotirlingas of India. The temple is supposed to have been originally constructed by Hemadri or Hemadpant, the chief minister of the Yadavas of Devagiri, of which nothing except an image of nandi remains to date. This gives the temple an antiquity of over 600 years and is proved by a date on one of the steps of the juna ghat. The present temple was built by Ahilyabai Holkar, who once happened to visit the site and moved by the ruined state of the temple ordered its reconstruction. The temple is visited by a large number of devotees everyday while the festival of Mahashivratri is celebrated with great enthusiasm and is attended by more than 7 lakh devotees.

13) Shani Temple, Rakshasbhuwan:

The temple of God Shani is situated on the bank of River Godawari. It is one of the holy places of Shani in whole India. There are three and half “Pith” of god Shani among which one Pith is situated in Rakshasbhuwan. Since the temple is situated along the River Godawari, the scenic beauty is astonishing.

14) Sautada forest & Rameshwar Temple:

Sautada is known for the waterfall and the temple of Rameshwar. The river Vincarna rises at a place called Cikhli about 1.60 km from Sautada village falls down from a height of about 69 m and then further cuts its course through rugged hills and mountains clad with forests. The scene of the water falling down from such a great height is pleasing to the eye. From the mountain cliff down to the level of the river basin a flight of about 600 steps has been built. At the base of the fall there is a pond known as dev kund. It is so-called because it is supposed to have been created by Ram by shooting an arrow. Further away is a big water strip in the form of a doh called Sita kund. On a stone slab here, there are the footprints of

Sita. Amidst such fascinating natural surroundings is situated the temple of Rameshwar built in the Hemadpanti style.

15) Purushottampuri:

The temple of Purushottampuri is located very close to the bank of Godavari. One of the special features of the temple is that the bricks of the temple still float on water. Adhik Mass which comes once in 3 years during the month of Jul / Aug is celebrated with great enthusiasm and is attended by more than 10 lakh people from all over Maharashtra, Andhra Pradesh, Karnataka etc.

16) Vitthal Rukhmai, Chinchwan:

This temple is very old and was built during Chalukyan period. The architecture of the temple resembles to Mathura style. All the 10 incarnation of Vishnu are depicted beautifully in the walls of temple by means of carvings. Symbols of Gods like Ganesh, Hanuman etc and of animals like Peacock are also portrayed. “Kirtimukh” the traditional symbol of Chalukyan period is also found here at many places. The temple is in dipalitated condition presently.

17) Jagdamba Devi, Aaicha Tanda:

Temple of Jagdamba Devi situated on a small hillock. There are other small temples in the compound on side of main temple. One needs to come by own vehicle as no public transport is available till the temple. Dussara is celebrated with great enthusiasm in the month September / October for 9 days and is attended by more than 35000 persons per day while the last day observes nearly 2.5 lakh devotees. Apart from other district of Maharashtra like Jalna, Aurabgabad, Parbhani etc devotees also comes from states like Karnataka, Andhra Pradesh etc

18) Kedareshwar:

The ancient temple is located just outside Dharmapuri village settlement, which is 29 km south of Ambejogai on the Pune-Nanded road. The temple consists of a shrine, an antechamber and a square hall with three porches to the north, south and east. The square sanctum of the temple contains a Shivlinga. The Shakha of the door of the sanctum have been artistically carved and includes rows of flowers, animals, columns and geometric motifs. Interestingly, this temple contains a large rangamandapa in the middle of which a place of performances has been made. On the exterior, there is a gajasthara along with a row

of mithuna sculptures on the adhishthana. Similarly, on the jangha, images of Vishnu, Shiva, Surasundaris etc have been beautifully carved. From its architectural style, the temple belongs to the eastern Chalukyan style of 11th and 12th century A.D. It is now a State protected monument.

1.33 Classification of Tourist Destinations:

Beed has a range of places of interest which can serve as tourist destinations to local, domestic as well as international tourists. Presently, a large number of these sites are important as local tourist destinations and have been attracting local visitation during weekends and during specific days of religious importance. It is estimated that about 58% of the total visitors to various tourist destinations are local (i.e. from within the Beed district), whereas 42% of the tourists are domestic tourists (i.e. from other parts of the country).

The list below mentions the number of tourists visiting each of these places of interest and their classification as major and minor tourist destinations. The map shows the location of the major and minor tourist destinations in the district.

Table 1.7: Estimated Annual Tourist Arrivals at Tourist Destinagtions in Beed District in 2011-12

S. No.	Destinations	Annual Tourist Arrivals	Local (fromdistrict)	Domestic (National)	Category
1	Kankaleshwar Temple	131,125	75%	25%	Minor
2	Yuva Shantivan	141,850	90%	10%	Minor
3	Khajana Bawdi	3,650	90%	10%	Minor
4	Mohammad Tuglak Tooth samadhi	0	100%	0%	Minor
5	Shahanshahwali Dargah	697,500	50%	50%	Major
6	Manmathswami, Kapildhar	1,365,000	15%	85%	Major
7	Gyaneshwar Mauli, Chakarwadi	7,025,000	60%	40%	Major
8	Khandoba Dipmaal Parisar	50,625	90%	10%	Minor
9	Khandoba Temple	218,250	90%	10%	Minor
10	Shani Temple, Rakashbhuwan	1,003,000	60%	40%	Major
11	Soutada forest & Rameshwar Temple	2,090,600	60%	40%	Major
12	Peacock Sanctuary, Naigaon	7,300	100%	0%	Minor
13	Jogeshwari Pargaon	93,500	50%	50%	Minor
14	Purushottampuri	1,109,500	50%	50%	Major
15	Keshavraj Temple, Kesapuri	52,375	90%	10%	Minor
16	Shukleshwar Nimgaon	111,625	70%	30%	Minor
17	Jayakwadi Dam	73,300	90%	10%	Minor
18	Mohammad Shah Ansari Dargah, Pathrud	223,500	80%	20%	Minor
19	Shiva Temple, Manjrath	375,000	70%	30%	Minor
20	Laxmi Trivikam Temple, Manjrath	34,250	85%	15%	Minor
21	Makardhwaj Temple, Chinchwan	62,775	80%	20%	Minor

22	Vitthal Rukhmai Temple, Chinchwan	62,775	80%	20%	Minor
23	Raja Harishchandra, Harishchandra Pimpri	148,375	70%	30%	Minor
24	Dharur fort	7,300	80%	20%	Minor
25	Ambachondi Temple	81,500	70%	30%	Minor
26	Jagdamba Temple, Aaicha Tanda	828,500	50%	50%	Major
27	Kashinath Hutatma Smarak	3,650	100%	0%	Minor
28	Devgaon	9,125	100%	0%	Minor
29	Parli Vaijnath	5,150,000	60%	40%	Major
30	Kedareshwar, Dharmapuri	9,125	80%	20%	Minor
31	Mukundraj Samadhi	35,250	80%	20%	Minor
32	Butinath Parisar	3,650	80%	20%	Minor
33	Nagnath Temple	4,650	80%	20%	Minor
34	Hattikhana	3,650	85%	15%	Minor
35	Yogeshwari Temple	955,000	60%	40%	Major
36	Kholeshwar Temple	36,500	80%	20%	Minor
37	Barakhambi	3,650	85%	15%	Minor
38	Amruteshwar Temple	41,900	80%	20%	Minor
39	Dasopanth Samadhi	42,500	70%	30%	Minor
	Total Visitation (No.)	22,296,825	12,864,431 (58%)	9,432,394 (42%)	

(Source: District Tourism Plan. Beed)

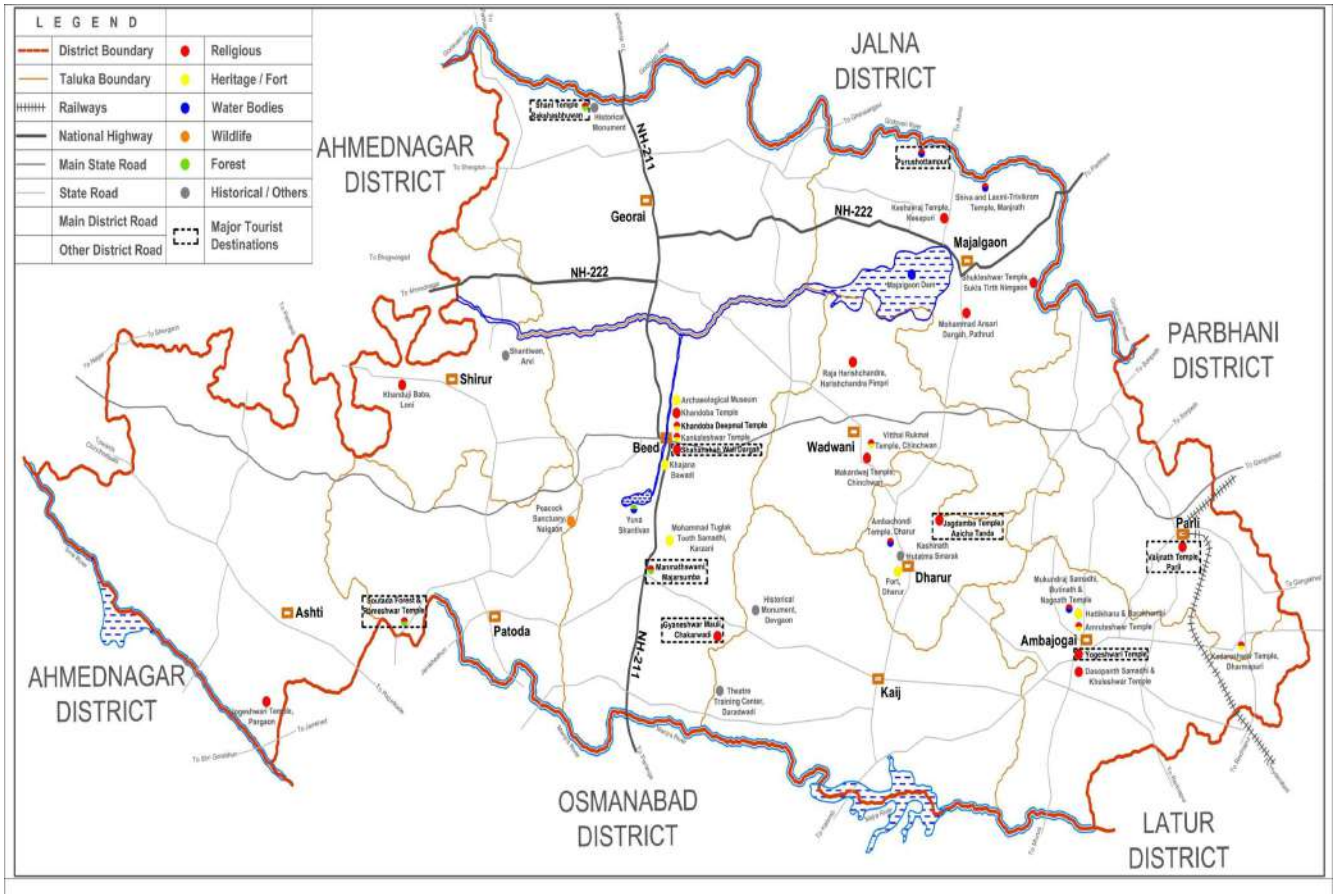


Figure 1.9 : Major and Minor Tourist Destinations in Beed District

1.34 Transport and Communication:

The district is well connected in terms of road connectivity. NH-211 from Dhule to Solapur provides north-south connectivity to the district and connects Dhule, Ellora and Aurangabad in the north and Osmanabad & Solapur in the south. NH-222 from Kalyan near Mumbai in Maharashtra to Nirmal near Adilabad in Andhra Pradesh provides east-west connectivity to Beed and intersects NH-211 near Gevrai. Apart from these National Highways, various State highways pass through the district and connect the near towns and cities.

Beed district is not favourably situated as regards to railway transport. Railway facilities are inadequate and serve only a small part of the district. At present,the district is served by two branch lines of the South Central Railway, viz., Vikarabad-Parali line and Parbhani-Parali line, and they cover the eastern area of Ambejogai tehsil. These routes terminate at Parali Vaijnath. The total length of railways in the district is about 48 kilometres.

Beed district does not have airport facility and the nearest domestic airport lies at Aurangabad (133 km). Nearest international airports are Mumbai (418 km), Hyderabad (428 km) and Pune (250 km).

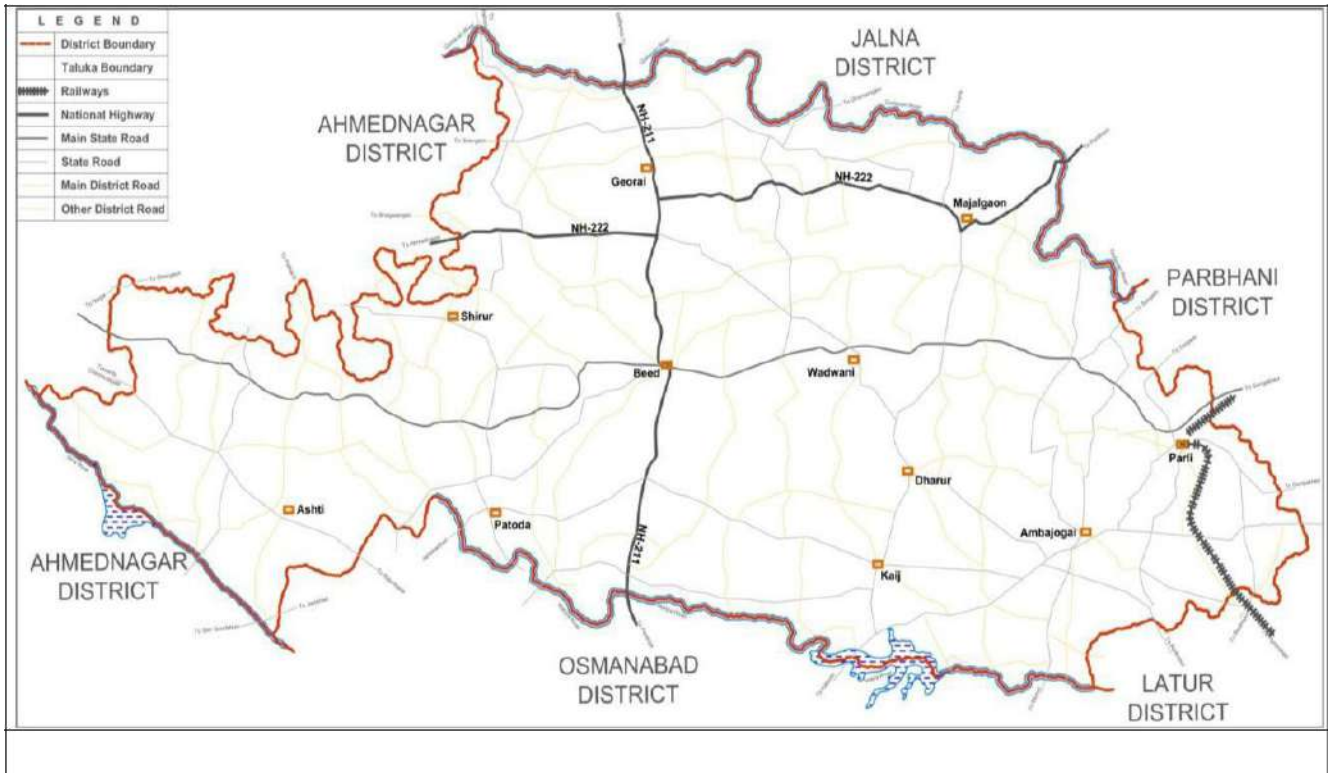


Figure 1.10 : Regional Connectivity of Beed District

1.35 Posts and Telegraphs:

There has been acceleration in the development and expansion of the postal services since independence. At present there are one head Post Office, 11 Sub-post Offices and 330 Branch Offices in the District.

Sr. No.	Takula	No. of Branch Post Offices	NO. of Post Boxes
1	**Ashti**	47	85
2	**Patoda**	26	89
3	**Shirur**	21	49
4	**Gevrai**	37	86
5	**Majalgaon**	39	91
6	**Wadvani**	15	63
7	**Beed**	44	112
8	**Kaij**	44	96
9	**Dharur**	17	78
10	**Parli**	16	88
11	**Ambajogai**	24	92
	Total	**330**	**929**

(Source: DSA 2017)

Chapter 2

2.1 Hazard, Risk, Vulnerability and Capacity Analysis

The district of Beed is prone to multiple hazards of both natural and man-made kind. The chapter deals in depth about each hazard- their causes and impact and also analyses how various socio-economical and physical vulnerabilities aggravates the hazards to potential disasters. The chapter also discusses the strength and various capacities of the district to combat the emergency situations.

		SEVERITY			
Probability / Frequency of Occurrence		4 Catastrophic	3 Critical	2 Marginal	1 Negligible
	5 Frequent	Drought, Road Accident			
	4 Probable		Flood, Lightning	Heat wave, Hailstorm, Fire	
	3 Occasional			Stampede	
	2 Rare				Rail Accident
	1 Improbable				Earthquake

2.2 Flood

Floods refer to huge amount of water reaching land in a short span of time, causing land surface to be submerged under water – at places, where, land surface is usually not covered with water. Floods could be caused due to natural causes or human activities or a combination of both. Floods are caused by discharge of huge volume of water in a short span of time at a rate, such that the water cannot be carried away from the scene of discharge. Some of the possible reasons for such huge discharge of water could be: Godavari river is the main river which flows through the Northern part of the district. Manjra, Sindphana, Bendsura and Wan are other rivers in the district. There are smaller rivers in the district, which go dry during summer season.

On 23rd July 1989 Flood took place in three habitations in the Beed town which resulted in loss of property and money & ended up killing 131 people out of which 126 were from Beed tahsil, 04 were from Kaij tahsil and remaining 01 was from Gevrai tahsil. There is also a huge number of people were missing in this flood.

During monsoon, due to release of extra water from Jayakwadi dam downstream rivers get over filled with water and starts flowing through the sides causing flood like situation in the region affecting mostly Gevrai, Majalgaon and Parli talukas. In August 2006 irrigation authorities in Aurangabad released 1.75 lakh cusecs of water from Jayakwadi Dam into Godavari river because of that 23 villages in Georai taluka, 25 villages in Majalgaon taluka & 5 villages in Parli talukas were affected by flood.

During 22.09.2016 to 03.10.2016 this period Beed city and all talukas in district received heavy rainfall due to this all dams and reservoirs were overflowing. The Bindusasra Dam, which had been dry for seven years, was then overflowing, as was the Majalgaon Dam. Beed city and many villages were under water due to the floods. People had been safely evacuated and two NDRF teams were in the area to handle flood-related rescue and rehabilitation efforts.

Table 2.2.1 : Vulnerable Bridges in Beed District

Sr. No.	Name of Division	No. of Vulnerable Bridges
1	Public Works Department, Ambajogai	05
2	Public Works Department, Beed	02
3	Executive Engineer, Works Department No.2, Zilla Parishad, Beed.	05
4	Executive Engineer, Works Department No.1, Zilla Parishad, Beed.	12
5	National Highways	01
	Total	**25**

(Source: P.W.D. Beed & Works Dept. Z.P.Beed)

Table 2.2.2 : List of Flood Prone Villages in Beed District

Sr.No.	Name of Taluka	Name of River	Name of Flood Prone Village
1	Gevrai	Godavari	Mirgaon
2			Pandhari
3			Pangulgaon
4			Katchincholi
5			Gangawadi
6			Rajapur
7			Hingangaon
8			Gondi
9			Bhogalgaon
10			Kathoda
11			Rampuri
12			Raheri
13			Borgaon(Budruk)
14			Dhalegaon
15			Borgaon Thadi
16			Guntegaon
17			Mhalas (P)
18			Panchaleshwar
19			Savaleshwar
20			Nagzari
21			Agarnandur
22			Sangamjavalgaon
23			Gopatpimpalgaon
24			Shripat (A)
25			Rakshasbhuvan
26			Patharwala (K)
27			Patharwala (B)
28			Gulaj/Bhagwannagar
29			Suralegaon
30			Manubhai Jawala
31			Tapenimgaon
32			Khamgaon

33	Parli	Godavari	Borkhed
34			Tilasmukh
35			Mamdapur
36			Digras
37			Pohner
38	Majalgaon	Godavari	Shelgaonthadi
39			Righori
40			Koudgaonthadi
41			Hivra (Budruk)
42			Kalegaonthadi
43			Purushottampuri
44			Dubbathadi
45			Mahatpuri
46			Jaykochiwadi
47			Sadola
48			Manjrath
49			Mogra
50			Ambegaon
51			Aalsewadi
52			Aadola
53			Gangamasla
54			Surunggaon
55			Sonnathadi
56			Shakaltirth Limgaon
57			Gunjthadi
58			Pimpari (Khurd)
59			Gavhanthadi
60			Chatrborgaon
61			Sakhar Pimpalgaon
62			Somthana
63			Khatgavan
	Total		**63**

Table 2.2.3 : Bridges submerged in floodwater during 22.09.2016 to 03.10.2016

Sr. No.	Name of Division	No. of Bridges Submerged
1	Public Works Department No. 1, Beed	78
2	Public Works Department No. 2, Beed	15
3	Public Works Department, Ambajogai	79
4	Works Department No.1, Zilla Parishad, Beed.	41
5	Works Department No. 2, Zilla Parishad, Beed.	57
	Total	**270**

(Source: P.W.D. Beed & Works Dept. Z.P.Beed)

Table 2.2.4 : Talukawise rainfall of Beed district from year 2008 to year 2017 (in m.m.)

Sr. No.	Taluka	Rainfall Recorded During the period from 1 June to 31 October in mm.									
		2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
1	**Beed**	696.00	677.00	793.00	961.00	439.8	643.1	417.3	308.3	733.8	673.74
2	**Patoda**	535.00	676.00	755.00	607.00	307.6	620.0	424.0	310.1	904.0	821.00
3	**Ashti**	650.00	665.00	907.00	527.00	260.3	478.3	308.5	323.5	641.7	766.72
4	**Gevrai**	592.00	797.00	833.00	714.00	267.4	556.8	275.6	217.0	695.8	559.30
5	**Shirur**	519.00	591.00	641.00	523.00	259.8	460.0	362.6	273.0	633.7	591.67
6	**Wadwani**	662.00	654.00	1005.00	834.00	496.5	931.0	455.5	500.0	1025.3	756.50
7	**Ambajogai**	661.00	807.00	1001.00	951.00	682.6	789.9	457.2	412.8	969.0	808.20
8	**Majalgaon**	627.70	568.00	1118.00	705.00	502.8	831.0	389.3	395.4	1025.2	687.83
9	**Kaij**	625.30	676.00	990.00	742.00	455.2	648.3	347.6	290.0	876.1	821.73
10	**Dharur**	653.00	673.00	1128.00	841.00	512.0	613.4	321.0	211.4	842.7	676.31
11	**Parli**	750.00	533.00	1008.00	592.00	664.2	813.2	317.2	392.6	838.2	587.40
	Average	**633.73**	**665.20**	**925.40**	**727.00**	**440.7**	**671.4**	**370.5**	**330.4**	**835.0**	**704.60**

(Source: Natural Calamity Branch, Collector Office, Beed)

2.3 Drought

It is difficult to provide a precise and universally accepted definition of drought due to its varying characteristics and impacts across different regions of the world, such as rainfall patterns, human response and resilience, and diverse academic perspectives.

Drought is a temporary aberration unlike aridity, which is a permanent feature of climate.Seasonal aridity (i.e. a well-defined dry season) also needs to be distinguished from drought. Thus *drought is a normal, recurrent feature of climate and occurs in all climatic regimes and is usually characterized in terms of its spatial extension, intensity and duration*. Conditions of drought appear when the rainfall is deficient in relation to the statistical multi-year average for a region, over an extended period of a season or year, or even more.

Drought differs from other natural hazards such as cyclones, floods, earthquakes, volcanic eruptions, and tsunamis in that:

- No universal definition exists;
- Being of slow-onset it is difficult to determine the beginning and end of the event;
- Duration may range from months to years and the core area or epicentre changes over time, reinforcing the need for continuous monitoring of climate and water supply indicators;
- No single indicator or index can identify precisely the onset and severity of the event and its potential impacts; multiple indicators are more effective;
- Spatial extent is usually much greater than that for other natural hazards, making assessment and response actions difficult, since impacts are spread over larger geographical areas;
- Impacts are generally non-structural and difficult to quantify;
- Impacts are cumulative and the effects magnify when events continue from one season or year to the next.

2.3.1 Classification of Drought

In the literature, droughts have been classified into *three* categories in terms of impact.

1. Meteorological drought
2. Hydrological drought
3. Agricultural drought

Meteorological Drought

Meteorological drought is defined as the deficiency of precipitation from expected or normal levels over an extended period of time. Meteorological drought usually precedes other kinds of drought. According to the legend, meteorological drought is said to occur when the seasonal rainfall received over an area is less than 25% of its long-term average value. It is further classified as

moderate drought if the rainfall deficit is 26–50% and *severe drought* when the deficit exceeds 50% of the normal.

Hydrological Drought

Hydrological drought is best defined as deficiencies in surface and subsurface water supplies leading to a lack of water for normal and specific needs. Such conditions arise, even in times of average (or above average) precipitation when increased usage of water diminishes the reserves.

Agricultural Drought

Agricultural drought, usually triggered by meteorological and hydrological droughts, occurs when soil moisture and rainfall are inadequate during the crop growing season causing extreme crop stress and wilting. Plant water demand depends on prevailing weather conditions, biological characteristics of the specific plant, its stage of growth and the physical and biological properties of the soil. Agricultural drought thus arises from variable susceptibility of crops during different stages of crop development, from emergence to maturity. In India, it is defined as a period of four consecutive weeks (of severe meteorological drought) with a rainfall deficiency of more than 50% of the long-term average (LTA) or with a weekly rainfall of 5 cm or less from mid-May to mid-October (the kharif season) when 80% of India's total crop is planted or six such consecutive weeks during the rest of the year (National Remote Sensing Centre, Decision Support Centre).

2.3.2 Impacts of Drought

Drought produces wide-ranging impacts that span many sectors of the national economy. These impacts are felt much beyond the area experiencing physical drought. The complexity of these impacts arises because water is integral to our ability to produce goods and provide services.

Drought produces both direct and indirect impacts. Direct impacts or primary impacts are usually physical / material and include reduced agricultural production;increased fire hazard; depleted water levels; higher livestock and wildlife mortality rates; and damage to wildlife and fish habitats. When direct impacts have multiplier effects through the economy and society, they are referred to as indirect impacts. These include a reduction in agricultural production that may result in reduced income for farmers and agribusiness, increased prices for food and timber, unemployment, reduced purchasing capacity and demand for consumption, default on agricultural loans, rural unrest, and reduction in agricultural employment leading to migration and drought relief programmes. The more removed the impact from the cause, the more complex is the link to the cause. These multiplier effects are often so diffuse that it is very difficult to generate financial estimates of actual losses caused by a drought.

The impacts of drought are generally categorized as economic, environmental, and social.

Economic Impacts

Economic impacts refer to production losses in agriculture and related sectors, especially forestry and fisheries, because these sectors rely on surface and subsurface water supplies. It causes a loss of income and purchasing power, particularly among farmers and rural population dependent on agriculture. All industries dependent upon the primary sector for their raw materials would suffer losses due to reduced supply or increased prices. Drought thus has a multiplier effect throughout the economy, which has a dampening impact on employment, flow of credit and tax collections. If the drought is countrywide, macroeconomic indicators at the national level are adversely impacted.

Environmental Impacts

Environmental impacts, such as lower water levels in reservoirs, lakes and ponds as well as reduced flows from springs and streams would reduce the availability of feed and drinking water and adversely affect fish and wildlife habitat. It may also cause loss of forest cover, migration of wildlife and their greater mortality due to increased contact with agricultural producers as animals seek food from farms and producers are less tolerant of the intrusion. A prolonged drought may also result in increased stress among endangered species and cause loss of biodiversity.

Reduced streamflow and loss of wetlands may cause changes in the levels of salinity. Increased groundwater depletion, land subsidence, and reduced recharge may damage aquifers and adversely affect the quality of water (e.g., salt concentration, increased water temperature, acidity, dissolved oxygen, turbidity). The degradation of landscape quality, including increased soil erosion, may lead to a more permanent loss of biological productivity of the landscape.

Social Impacts

Social impacts arise from lack of income causing out migration of the population from the drought-affected areas. People in India seek to cope with drought in several ways which affect their sense of well-being: they withdraw their children from schools, postpone daughters' marriages, and sell their

assets such as land or cattle. In addition to economic hardships, it causes a loss of social status and dignity, which people find hard to accept. Inadequate food intake may lead to malnutrition, and in some extreme cases, cause starvation. Access and use of scarce water resources generate situations of conflict, which could be socially very disruptive. Inequities in the distribution of drought impacts and relief may exacerbate these social tensions further.

2.3.3 Drought in Beed

Beed district experienced drought in summer season in year 2012-2013, 2014-2015 and 2015-2016 respectively.

In year 2012-2013 Beed, Ashti, Patoda, Shirur Kasar, Gevrai only these five talukas out of eleven faced severe drought situation whereas In year 2014-2015 & 2015-2016 all eleven talukas of Beed district experienced severe type of agricultural drought.

Date/Year of Occurrence	Area Affected (Location) (Ex. Village name, river basin etc.)	Human Life Loss		Cattle Loss		Land Affected	
		Dead	Injured	Dead	Injured	Land Specification	Area (No./Acers/ Hectares)
2012-2013	Beed, Ashti, Patoda, Shirur Kasar, Georai talukas of district.	Nil	Nil	Nil	Nil	Agricultural Land	Beed, Ashti, Patoda, Shirur Kasar, Georai talukas of district.
2014-2015	All talukas of Beed District	Nil	Nil	Nil	Nil	Agricultural Land	All talukas of Beed District
2015-2016	All talukas of Beed District	Nil	Nil	Nil	Nil	Agricultural Land	All talukas of Beed District

(Source: Natural Calamity Branch, Collector Office, Beed)

2.4 Road Accidents

With the increase in number of public, private and Govt. conveyance road accident have become a regular phenomena resulting in loss of lives and or causing severe injuries. The traffic circulation pattern within Beed city was designed for a smaller population. Over the last one decades, due to explosive growth in infrastructure, improved road system such as flyover, state and national highways, the number of vehicles has increased exponentially. Smooth infrastructure also allows the public to speed up leading to more number of accidents.

Table 2.5 : Human Life Losses in Road Accidents in Beed District

Date/Year of Occurrence	Human Life Loss	
	Dead	**Injured**
2011	346	525
2012	329	419
2013	333	522
2014	336	509
2015	286	458
2016	295	249
2017	318	288
Total	**2243**	**2970**

(Source: S.P.Office, Beed)

2.5 Fire

Fire is very common in both rural and urban areas of the district due to varied causes. In rural areas, the common cause of fire outbreak is negligence while in urban areas, fire incidents are mainly due to short circuits. They quite often, illegally tap electricity and use various types heavy load gadgets like heater, iron, heating roads etc. The power lines are tapped with naked wires loosely connected, which quite often generate sparks. Besides, use of cooking gas is increasing among the slum dwellers. All these factors coupled with acute water scarcity make a perfect recipe for fire disasters.

Date/year of Occurrence	Category/ Intensity	Duration (No. of days)	Frequency	Area Affected (Location) (Ex. Village name, river basin etc.)	Human Life Loss	
					Dead	Injured
2014	2	1	2	1. MIDC 2. Forest Dept., Manzeri, Beed	--	--
2015	2	1	3	1. MIDC 2. Khasbag area 3. B & C quarter, Dhanora Road, Beed	--	--

(Source: Fire Brigade Dept, Beed)

2.6 Heat wave/Cold Wave

Heat wave and cold wave are seasonal hazards witnessed in the district. Beed district witness extreme heat and extreme cold, due to the variation in temperature and because of that many people get affected and fall ill; there are some deaths have been also reported due to these hazards. In 2016 two persons died to heat wave. In current year uptill now two persons died due to heat wave. Due to cold wave not even a single casualty is reported in last ten years in Beed district.

2.7 Lightning

Lightning is very common phenomenon in District Beed. Some time it damaged the Infrastructure also. Agricultural loss due to loss of trees is also reported. Most lightning deaths and injuries occur when people are caught outdoors in the month of April to September during the rainy season or in Unseasonal/Premonsoon rainy days mostly in the month of February & March. Following table shows deaths due to lightning in Beed district in past few years.

Sr. No.	Year	Deaths Due to Lightning
1	2005	07
2	2006	30
3	2007	18
4	2008	18
5	2009	15
6	2010	17
7	2011	03
8	2012	03
9	2013	13
10	2014	16
11	2015	11
12	2016	08
13	2017	14
	Total	**173**

(Source: Natural Calamity Branch, Collector Office, Beed)

2.8 Hailstorm

Beed has witnessed loss due to hailstorm also not at a major level but the agricultural crops, environment; people are at risk at it. As it is a natural hazard particular area could not be predicted and hence the entire district is prone to the hazard.

Date/year of Occurrence	Area Affected (Location) (Ex. Village name, river basin etc.)	Human Life Loss		Cattle Loss		Land Affected	
		Dead	Injured	Dead	Injured	Land Specification	Area (No./Acers/ Hectares)
February, March 2014	All 11 takulas in Beed District.	Nil	Nil	Nil	Nil	Agricultural Land	5692.36 Ha
April, May, June 2014	Beed & Ashti takulas.	Nil	Nil	Nil	Nil	Agricultural Land	168.80 Ha
February, March 2015	Wadvani & Ashti takulas.	Nil	Nil	Nil	Nil	Agricultural Land	1000.0 Ha
April 2015	Beed, Ashti, Ambejogai, Kaij, Wadvani, Parli, Majalgaon, Dharur talukas.	Nil	Nil	Nil	Nil	Agricultural Land	5282.04 Ha
2017	Beed, Kaij, Parli, Majalgaon, Dharur talukas.	Nil	Nil	Nil	Nil	Agricultural Land	5280.10 Ha.
January, February 2018	Gevrai, Shirurkasar, Majalgaon, Kaij	Nil	Nil	Nil	Nil	Agricultural Land	4403.00 Ha.

(Source: Natural Calamity Branch, Collector Office, Beed)

2.9 Stampede

Beed is a religious place and there are many places which has religious importance. Like Mahashivratri (Parli) and Khandeshwari Devi (Beed), Kankaleshwar (Beed). During Shiv Ratri crowd gathered in huge number in Parli Vaijanath. But there is no causalities in the past but we can't ignore it from to Hazard aspect. Administrations with the help of Police, Homeguard to manage the situation of crowd.

Table 2.9.1 : List of Mass Gathering

Sr. No.	Taluka	Village	Name of the Event/Yatra/Mela etc.	Expected People
1	Beed	Beed	Khandeshwari Devi	50000 to 60000
		Beed	Kankaleshwar	25000 to 30000
		Beed	Someshwar	5000 to 7000
		Beed	Papneshwar	1500 to 2000
		Beed	Jatashankar	2000 to 2500
		Beed	Shahenshavali Dargah	25000 to 35000
		Beed	Mansoorshah Shavli Dargah	10000 to 15000
		Shivni	Khandoba Yatra	3000 to 5000
		Imampur	Mhasoba Yatra	2000
		Bhaganwadi	Tuljabhavani Yatra	3000 to 5000
		Kolwadi	Manmathswami	10000 to 20000
		Belgaon	Mahashivratri	5000
		Morgaon	Mahadev	5000
		Limbaganesh	Ganesh Chaturthi	10000
		Kamkheda	Urus	5000
		Shidod	Mahalaxmi Devi Navratri	10000
		Namalgaon	Ganesh Chaturthi	25000
		Ramgad	Ramnavami	10000
		Nalwandi	Someshwari Ekadashi	2000 to 3000
		Dhekanmoha	Narali Pournima	40000 to 50000
		Ghatsavali	Champashashthi	5000 to 10000
		Eit	Gugladevi	4000 to 5000
		Mhalasjavla	Mohiniraj Yatra	2000 to 3000
		Nagapur (Kh.)	Piraji Yatra	4000 to 5000
		Gundha	Brahamanath Yatra	3000 to 3500
		Tadsonna	Bhairavnath Yatra	3000 to 4000
		Chousala	Chandanshahvali Baba Yatra	3000 to 4000
		Chakarwadi	Uttareshwar Mauli Yatra	25000 to 30000
		Neknur	Urus	4000 to 5000
		Rajuri Navgan	Ganpati	2000 to 3000
		Palvan	Renukamata Yatra	2000 to 3000
2	Gevrai	Talwada	Tvaritadevi	79000
		Madalmohi	Mohimata Devi	40000
		Jategaon	Yamadevi	35000
		Pachegaon	Kanifnath	34000
		Chaklamba	Chimadevi	45000
		Rakshasbhuvan	Shani Janmotsav	200000
		Panchaleshwar	Datt Jayanti	50000
		Kumbhejalgaon	Gorakshnath	15000
		Kolgaon	Koleshwar	45000
		Shirasmarg	Santu Aai	55000
		Nipani Javalka	Jyotiba	35000
		Rohital	Khairbaba	50000
		Ranjani	Pirachi	80000
		Aagar Nandur	Pirachi	60000

3	Wadwani	Devla (BK)	Kanhoba Yatra	2000
		Wadwani	Ramazan/Bakri Eid	2000
		Wadwani	Mohatadevi Yatra	5000
		Chinchala	Khandoba Yatra	5000
		Pardi	Mari Aai Yatra	2000
		Upali	Jyotiba Devasthan	5000 to 6000
		Harishchandra Pimpari	Mahashivratri	2000 to 25000
		Chinchwadgaon	Devi	500 to 600
		Chinchwadgaon	Ingale Maharaj	1000 to 1500
		Pusra	Mari Aai	3000
		Morwad	Khandoba	5000
		Khadki	Khandoba Yatra	5000
		Tokewadi	Pir Yatra	2000
		Ruipimpala	Gaibi Yatra	1000
		Depdi	Ranubai Yatra	2000 to 25000
		Pimparkhed	Sandal & Birudev	500 to 1000
		Chinchwan	Makardhwaj Janma Utsav	2000 to 1000
4	Ashti	Belgaon	Renukadevi	7000 to 9000
		Waluj	Bhairavnath	42000 to 47000
		Brahamgaon	Shrungeri Devi	1000 to 3000 Daily
		Pargaon Jo	Jogeshwari Devi	2000 to 3000
		Ashti	Fatteshah Bukhari	2000 to 3000
		Ashti	Khandoba	1000 to 1500
		Kada	Sailani Baba	10000 to 15000
		Vyahira	Shaikh Mahammad Maharaj	5000 to 7000
		Nagtala	Nagnath	4000 to 6000
		Sawargaon	Machhindranath	20000 to 25000
5	Patoda	Soutada	Rameshwar	10000
		Rohatwadi	Jagdamba Devi	25000
		Patoda	--	25000
		Pimpalwandi	Ashwaling	50000
		Nalwandi	Janpeer	25000
		Kusalamb	Khandoba	30000
6	Shirur	Manur	Tisara Shrawani Somwar	15000 to 20000
		Narayangad	Margashish Pournima	25000 to 30000
7	Ambajogai	Ambajogai	Dargah Hajrat Khwaja Shaikh Masood Kirmani Sandal & Urus	4000 to 5000
		Ambajogai	Yogeshwari Devi Yatra	25000 to 30000
		Ambajogai	Mukundraj Swami Yatra	4000 to 5000
		Ambajogai	Dargah Hajrat Khwaja Shaikh Masood Kirmani Sandal & Urus	1000 to 5000
		Ambajogai	Inam Badeji Masjid Yatra	2500 to 3000
		Bardapur	Pachpeer Yatra	17000 to 18000
		Bardapur	Inam Ali Shah Dargah Urus	5000 to 7000
		Saygaon	Sadeb Ali Shah Dargah & Urus	1000 to 1500
		Ghatnandur	Someshwari Temple Yatra	3500 to 4000
		Pattiwadgaon	Khandoba Devaji Yatra	1500 to 2000

		Pattiwadgaon	Jangdamba Devachi Yatra	10000 to 15000
		Ujani	Ambabai Devji Yatra	2500 to 3000
		Murkutwadi	Khandoba Yatra	4000 to 5000
		Pus	Padmavati Devi Yatra	10000 to 12000
8	Majalgaon	--	--	--
9	Parli	Parli Vaijanath	Mahashivratri	300000 to 350000

(Source: Yatra SOP, Collector Office, Beed)

2.10 Rail Accident

Beed is a Railway Juction. There is only one big railway station in the district named Parli. Due to this, there are less chances of rail accidents. Accidents are also possible by negligence of people who are not following rules at railway crossings or who let their cattle roam and graze near railway track. Following table shows past incident of train accidents found recorded.

Date/year of Occurrence	Category/ Intensity	Duration (No. of days)	Frequency	Area Affected (Location) (Ex. Village name, river basin etc.)	Human Life Loss	
					Dead	Injured
03rd January 2003	1	1	1	Ghatnandur Tq. Ambejogai Dist. Beed	18	41
24th April 1998	1	1	1	Parli Tq. Parli Dist Beed	24	32
Total					**42**	**73**

(Source: D.R.M. Office, Nanded)

2.11 Earthquake

Beed falls under seismic hazard zone III in India accorfing to the new seismic hazard map updated in the year 2000 by the Bureau of Indian Standards. Before this update the town was under zone I. Although no major earthquake have occurred in the district. Latur earthquake was one of the deadliest earthquakes Maharashtra has seen till date. which has affected the district moderately and aftershocks were felt by the people.The earthquake struck at about 3.56 am on September 30, 1993. In the intraplate earthquake about 52 villages were destroyed, over 30,000 were injured and approximately 10,000 were killed. The earthquake left a huge hollow at Killari, which was also the epicentre, remains in place till date.

2.12 Hazard Seasonality Analysis

Hazards like flood, drought and extreme temperatures have a seasonal occurrence while hazards like earthquake along with various man-made hazards can occur at any point of time of a year. Thus hazard seasonality map of Beed district is made based on the history of occurrence of various disasters in district and also on the possibility of occurrence of hazards in future. Table below displays possibility of occurrence of these hazards. The table also differentiates month-wise occurrence of these hazards by a scale of high, moderate and low/ negligible probability.

Sr. No	Hazard	Month of the Year											
		J	F	M	A	M	J	J	A	S	O	N	D
1	Flood												
2	Fire												
3	Road accident												
4	Lightning												
5	Heat wave												
6	Hailstorm												
7	Stampede												
8	Rail Accident												
9	Earthquake												
10	Air Accident												

2.13 Risk Analysis

When hazard strikes at vulnerable areas or amidst vulnerable population, it leads to disasters and pose risk to the affected area or population. At this juncture, the capacity or resources available within the area or with the population help them cope with or reduce this risk. The possible hazards in the district pose different level of risk depending on various factors such as frequency of occurrence, probable impact, etc. categories hazards based on the level of risk they pose (high, medium and low). It also shows major elements at risk and the vulnerable areas for these hazards,

2.13.1 Risk Analysis Index and Elements at Risk:

Serial Number	Hazard Risk	Name of Hazard	Risky Elements
1.	**High Risk Hazard (Score 20-15)**	Flood	Agriculture crops Transport Construction Activity Drinking water Cattle and its food Vulnerable Groups Electricity Rice mills Livelihood
		Road accident	Human Life Transport Network
		Lightning	Human loss Agriculture Crops Transport Cattle
2.	**Medium Risk Hazard (Score 14-8)**	Fire	Human Life Cattle life Houses and property Crops in fields
		Hailstorm	Agriculture
		Heat wave	Loss of Life
3.	**Low Risk Hazard (Score 7-1)**	Stampede	Human Loss Infrastructure Loss
		Earthquake	Human loss Transport Houses Infrastructure Cattle loss

2.14 Vulnerability analysis

There are multiple types of vulnerabilities present in Beed district owing to varied roots causes like high population growth, rapid-urbanization, increasing industrialization, rapid development within high risk seismic zone, environmental degradation, etc. These vulnerabilities have been categorized in four major types, namely, social, physical, economic and environmental vulnerability.

2.14.1 Physical Vulnerability

It is present in Beed district, flood like situation arises in district, some of rivers and dam also present in district. Due to Majalgaon, Bindusara and Manjara dams different roads of Beed, Gevrai, Majalgaon and Parli tahsil are also at risk. Physical Vulnerability is also present in other Block like Ambajogai, Dharur and others. As we know that in the Beed district the Flood prone Blocks are Beed, Gevrai, Majalgaon and Parli so these blocks are more have infrastructural vulnerability. Housing system of district is most vulnerable especially in villages where the house walls are made up of unburnt bricks, plastic and others plastics.

2.14.2 Social Vulnerability

There are various conditions determined by social factors or processes prevalent in Beed district which increase the susceptibility of a community to the impact of hazards. These include gender, age, caste and disabilities.

2.14.2.1 Age

The vulnerable age groups are that of 0-6 years and old age people. According to 2011 census, 0-6 age group population is 2,94,584 Children of this age group along with adolescent girls have their special needs for diet, sanitation, hygiene, safety and security. These needs aggravate further during disaster situation, particularly post disaster during relief and response. Children, particularly, adolescent girls also become further vulnerable to human trafficking and forced prostitution. Old age people are also vulnerable because of their limited physical strength, possible dependence on their families. Old age people also have their special needs like that of special medicines, spectacles and other aids, special diet. The dependence on others for these needs make this age group vulnerable during normal and particularly disaster situation.

2.14.2.2 Gender

Females of all age groups are part of vulnerable population because of safety and security reasons. The district has alarming cases of rapes and molestation. Safety and security of females is also of great concern in post disaster situations when relief camps are over-crowded, law and order conditions are under stress, etc. These make females vulnerable to human trafficking, forced prostitutions, rapes, molestation and sexual abuse. According to 2011 census, the sex ratio of the district is 916. Female literacy rate of 67.82 % is also much low compared to male literacy rate of 85.55%. This is a major factor of females being a vulnerable group as far as financial dependence on their male counterpart is concerned.

2.14.2.3 Caste

According to 2011 Population Census data, Beed district has the SC population of 13,275,898 and ST population of 10,510,213 accounts to 13.59% and 1.27% of the total population of the district.

2.14.2.4 Disabilities

Disability adds to vulnerability of a person as it reduces or limits the physical ability of the person to certain extent. Sometimes they also face social stigma and non-acceptance in the society. During a disaster situation, their conditions become worse if their aids (hearing, visual, etc.) get lost or damaged. They also have special needs in order to access public utilities and other facilities.

2.14.3 Economic Vulnerability

The low income group population faces challenges to live a life of dignity with all daily needs well met. Their low income status sometimes also forces them to choose cheap housing in vulnerable areas or occupation in hazard prone area. During 2011, income of agricultural laborers to plough is Rs 200, to sow is Rs 200, and to harvest is Rs 150. Apart from this a large number of people are also involved in unorganized sector for their living. Such population becomes highly vulnerable during disaster due to any damage or impact on market condition, production units, road or logistics network support, equipments, etc.

2.14.4 Environmental Vulnerability

2.14.4.1 Urbanization

Due to urbanization and limited livelihood opportunities in the rural ares, people are migrating to urban areas creating additional pressure on the limited resources. These all together form the key reasons for exploitation of the available resources, deforestation, unplanned development and various other related after effects including environmental degradation and risk of increasing man-made and human induced disasters.

2.14.4.2 Deforestation

As the population is increasing the need of people is also increasing. To fulfill these needs various developmental activities are required and being implemented which results in deforestation.

2.14.4.3 Water-Logging

Water-logging is a big issue in some of the wards of the Beed Municipal area. As many of the colonies do not have proper drainage system as these are the results of unplanned development. In some wards water-logging situation remains for whole year but during the monsoon period it became a big issue as in that period all the streets and roads in those locality got water-logged and people have to walk through it. Land encroachment is also a big reason for that as people have made their houses beyond the actual land they own. At some places drainage system are available but not maintained properly.

2.14.4.4 Soil Erosion

While all the rivers in the district are Monsoon Rivers; the high speed water flow of these rivers has made the embankments along with the river vulnerable at some of the places. The soil erosion along with the river banks has destroyed the agricultural land and in some places due to it whole village has been rehabilitated or some of the villages are at risk. In past there have been many locations where anti erosion activities like boulder pitching or geo-bag pitching carried out.

2.14.4.5 Air Pollution

Air pollution is one such form that refers to the contamination of the air, irrespective of indoors or outside. A physical, biological or chemical alteration to the air in the atmosphere can be termed as pollution. It occurs when any harmful gases, dust, smoke enters into the atmosphere and makes it difficult for plants, animals and humans to survive as the air becomes dirty. Along with the increase in the population and Beed being a big city number of vehicles and emission of toxic gases from it are also more and making the environment vulnerable. As district has a huge rural area, in most of the villages people are using woods and leaves as fuel-fire which also emit huge amount of toxic gases.

2.15 Capacity Analysis

Capacity refers to the resources that are present in the district and can be used during peace time or disaster situation for various activities and services like that of search and rescue, first aid, medical response, etc. These capacities include trained human resources, equipments, critical life-saving facilities and infrastructure, etc. available in the district. Thus the capacity gives an insight on the capability of the District Administration to deal with any disaster or emergency situation using the locally available resources within the district. It also helps the administration to strengthen its capacity by identifying or procuring resources which are important but not available within the district. A brief of key resources available within the district is displayed in table below.

Key Resources within the District

Infrastructure	Quantity
Health	
Medical College and Hospital	01
Civil Hospital	01
Railway Hospital	Nil
Rural Hospital	15
PHC	50
SHC	280
Major Private Hospitals/Nursing Homes	267
Ambulance Services	19
Blood Banks	04
Veterinary Hospitals	98
Education	
Primary	3505
Middle School	657
Higher Secondary	249
Ashram Shala	86
Colleges	117

University	Dr. BAM University, Aurangabad.
Engineering College	01
Polytechnic	06
I.T.I.	15
Police	
Police Station	27
Fire Stations	
Government fire station	07
Roads	
National Highways	2
State Highways	18
Main District Roads	59
Communication	
Telephone connection	15672
Post Offices	11 (330 Branch Post Office)
Telephone centre	292
Financial Institutions	
Commercial Banks	29
Rural Banks	50
Cooperative banks	13
Miscellaneous	
Petrol Pumps	62
LPG Agencies	21
Kerosene Dealer	12
PDS Shops	2018
PDS Godowns	22 (25050 M.T)

Aanganwadi Centres	2708
Nearest NDRF Batallion	05 BN NDRF, Pune
Radio station	109.2 MHz All India Radio Beed / Akashvani(AIR Beed)

Capacity analysis also includes actions (programmes, projects and/or measures) and instruments expressly aimed at reducing disaster risk in endangered regions, and mitigating the extent of disasters. Community-based adaptation, in particular, can build on the existing participatory approaches that are often already in place for disaster risk reduction. This can be analysed at the level of disaster preparedness and mitigation strategy adopted.

2.15.1 List of Search & Rescue equipments available in Emergency Operation Centre, Beed.

Sr. No.	Equipments	Quantity
1.	Tent	2
2.	Life Jacket	25
3.	Inflatable Jacket	7
4.	Life Buoy	30
5.	Multi Gas Detector (4 Gas)	1
6.	Emergency Bracelet	25
7.	Fire Extinguisher (Aerosol Type)	28
8.	Combi Rescue Tool Kit	1
9.	Portable Water Tank	1
10.	Portable Lighting System	1
11.	Concrete Cutter	1
12.	Rescue Chain Saw	1
13.	Light Weight Chain Saw	1
14.	Multi Escape Device	1
15.	Search Light	5
16.	Aluminium Folding Stretcher	25
17.	Floating Stretcher	40
18.	Rubber Boat With OBM Motor	1
19.	Rescue First Aid Kit	54
20.	Jumping Sheet	2
21.	Medical First Aid Kit	50
22.	Climbing Net	1
23.	Rope Rescue Kit	1
24.	Rubber Hand Gloves (Heavy Duty)	20
25.	Electric Hand Gloves (11 KV)	25

26.	Full Face Mask With Multi Gas	4
27.	Gum Boots With Steel Toe	30
28.	Megaphone	3
29.	Bolt Cutter 36	1
30.	BOB Rope 12 mm.	400 meters
31.	Manila Rope 24 mm. (ISI)	118 meters
32.	Helmet	35
33.	Headlight	30
34.	Under Water Torch	4
35.	Skill Belt Half	2
36.	Fire Extinguisher 5 Kg. (ABC Type)	10

(Source: DMU, Collector Office, Beed)

Chapter 3

3.1 Institutional Arrangement For Disaster Management Authority

The institutional mechanism for disaster management at the district level will be as follow:-

1) District Disaster Management Authority
2) District Disaster Management Advisory Committee
3) District Disaster Management Committee
4) Sub Divisional Disaster Management Committee
5) Village level Disaster Management Committee
6) Crisis Management Group/Incident Command System
7) Setting up of Emergency Operation Centre and its operation
8) Establishment of Site operation center
9) Modalities and procedures
10) Linkages with the Sub Plans

3.2 DISTRICT DISASTER MANAGEMENT AUTHORITY

This authority has been constituted under section 25 (1) of the Disaster Management Act 2005 under the chairmanship of District Collector i.e. Deputy Commissioner with the following officers as its members: -

Members	Designation
District Collector, Beed	Chairperson
President, Zila Parisad, Beed	Co- Chairperson
Chief Executive Officer, ZP Beed	Member
Superintendent of Police,Beed	Member
Residential Deputy Collector, Beed	Secretary
Chief Medical Officer (Civil surgeon)	Member
District Health Officer, ZP Beed	Member
Executive Engineer (PWD)	Member
Executive Engineer (Irrigation Department)	Member
Executive Engineer (Flood Control Division) Beed	Member
Deputy Superintendent of Police	Member
(Homeguards)	
Secertary, Redcross Society, Beed	Member
President, Lions Club, Beed	Member

3.3 Power and functions of District authority

As per section 30 of the Disaster management Act 2005, this authority has been vested with the following powers and functions:

1) It shall act as the planning, coordinating and implementing body in the district for Disaster management and take all measures for disaster management in the district as per the guidelines in the National/state Disaster management plans.
2) To prepare the District Disaster Management Plan of the district and its periodic review and update.
3) To identify the areas vulnerable to the different hazards in the district and measures for its prevention, mitigation thereof by the different departments and the local authorities at the district level.
4) Give direction to the different departments and the local authorities to take measures for prevention and mitigation of the disasters in the district.
5) Monitor the implementation of the disaster management plans prepared by the departments at the district level.
6) Lays down guidelines at the district level to be followed by the departments for integration of measures in their developmental plans for prevention and mitigation of the disasters.
7) Review the state of capabilities for responding to the disasters and give direction to the departments for their up gradation as may be necessary.
8) Organize and coordinate the specialized training programs for different level officers, employees and voluntary rescue workers in the district along with the community training programs.
9) Set up maintain and review the mechanism for early warnings and dissemination of the information to the general public.
10) To ensure that departments prepare their response plans in accordance with the district response plan.
11) Examine the construction in any area in the district and if it is of the opinion that thestandards for prevention, mitigation are not being complied with may direct the concerned authority to take such actions being necessary to secure such compliances.
12) Identify buildings and places which could in the event of disaster can be used as shelter/relief camps and make arrangements for sanitation and water supply in such places.
13) Ensure the communication systems are in order and disaster management drills are carried out periodically.

3.4 District disaster management advisory committee

As per section 28 of the District Disaster Management Act 2005, an advisory committee may be constituted by DDMA for efficient discharge of the functions.

3.5 District disaster management committee

In order to implement the District Disaster management Plan in the district the following committee has been constituted under the chairmanship of Deputy Commissioner as below:-

1) Superintendent of Police
2) Additional Deputy Commissioner
3) Additional District Collector (L& O)
4) Conservator of Forest
5) General Manager (Telecommunication)
6) Chief Medical Officer
7) Superintending Engineer (PWD)
8) Superintending Engineer (Irrigation)
9) Superintending Engineer (Power)
10) CEO of Zila Parishad
11) District Food and supplies controller
12) Commandant Home Guards
13) District/Divisional Fire Officer
14) District Supply Officer
15) District Town Planner (if present)
16) Commissioner Municipal Corporation
17) Deputy Director (Higher Education)
18) Deputy Director (Elementary Education)
19) Medical Superintendent
20) Civil Surgeon
21) Additional District Collector (Protocol)

3.6 Sub divisional disaster management committee

This committee shall be constituted at every sub division under the Chairmanship of Sub - Divisional Officer and the following members: -

1) Dypt. SP
2) Tahsildar
3) Block Development Officer
4) Block Medical Officer
5) Executive Engineers PWD, IPH, Electricity
6) Divisional Forest Officer
7) Sub divisional fire officer

All other Sub Divisional Officers

Non Official Members

1) Chairman /Vice chairman Panchayat Samiti
2) All members of Panchayat Samiti
3) Selected NGO/Volunteers/CBO in the sub division.

This Committee will prepare the Sub divisional disaster management Plans may be Sub-division wise if more than two sub-divisions are there and response plans in accordance with the District Disaster management plans and identify the hazards encountered by the people in past and send the data so collected to the District Disaster Management Authority for further updation in the disaster plan.

3.7 Village disaster management committee

This committee will function at the village levels and will be headed by Sarpanch Gram management plans in accordance with the District Disaster Management Plan. Panchayat with all the village/Panchayat officers and members its members and the secretary Gram Panchayat as member Secretary. This will prepare the panchayat wise disaster.

Chapter 4

4.1 Prevention and Mitigation

The phrase 'Culture of Prevention' refers to the action that needs to be taken at all levels to save lives before a disaster strikes. Prevention refers to the activities and measures that are taken to avoid existing and new disaster risks. While certain disaster risks cannot really be completely eliminated, prevention measures aim at reducing vulnerability and exposure. The key elements to prevention and mitigation are preventive planning and integration of disaster risk reduction measures in developmental planning. Disaster Prevention and Mitigation measures are guards of hazard impact. They stand against the intensity of the hazard impact and reduce the risk involved.

The High Powered Committee on Disaster Management carried out a series of consultations with Government, non-Government, National and international agencies and media organizations that submitted their findings on the disaster management scenario in their respective areas. This document that was made public in October 2001 became the basis for the planning process for prevention, preparedness and response plans for all administrative levels in our country. The report states that the major responders in disaster situations, the state governments are responsible for organizing an effective disaster response mechanism as well as preparedness and mitigation measures. The first step towards this is the strengthening of the organizational structure of disaster management at various levels and revising/ updating codes, manuals and disaster plans.

The importance of physical as well as socio-economic vulnerability is emphasized. The prevailing social and economic conditions and its affect on human activities affect the capacities of people to deal with the physical components of vulnerability. Thus the prevention and mitigation measures undertaken by the various levels of governance need to take into account both these aspects simultaneously. Policies that do not take into account both these aspects often fail to protect the populations they were created for. A good example of this are resettlement projects that do not take into account the traditional livelihood options of the people and fails to explore it's viability in the new area, or introduce alternate options.

Without a through vulnerability assessment it is impossible to create a preparedness and mitigation plan. The following steps were stated as imperative for the same –

- Identification of hazard prone areas.
- Preparation of vulnerability profiles that map physical as well as socio-economic hazards.

- Vulnerability and risk assessment of existing buildings and the initiation of retrofitting activities.
- The creation and implementation of technical guidelines for hazard resistant construction of buildings through techno-legal regimes.

This is an important aspect of prevention and mitigation activities as unplanned and inadequate developmental activity is one of the major causes of increased losses during disasters. Unchecked urbanization increases risks as communities live in high-density areas with poorly built and maintained infrastructure. Unplanned and unscientific urbanization, poor land use patterns and deforestation are discussed in the report as a major cause for losses of human life and infrastructure in the aftermath of a disaster

The report explores the disasters that India is vulnerable to in detail and divides it into geophysical regions based on topographic and climactic characteristics that make them susceptible to different types of disasters. In addition it looks at overarching issues of global warming and climate change, which it states will supersede all local environmental issues as it has the ability to completely change the face of the earth. It has been statistically proven that the Himalayan glaciers are shrinking steadily which means that entire water systems of the country will be affected. It is predicted that in the next 50 to 60 years the glaciers will stop producing the water levels that we witness and depend on. This will drastically cut down the water available downstream and adversely affect agricultural economies, which will cause tremendous social upheaval in areas already suffering from poverty.

Due to rapid population growth and urbanization in disaster prone areas, more and more people are vulnerable to disasters. Natural occurrence such as floods, earthquakes, cyclones etc. can't be avoided completely as it is a part of the environment we live in, however it's impact can be reduced and its worst effects prevented. A natural hazard turns into a disaster when it affects people and causes economic damage, i.e. when it hits a community and disrupts it's normal functioning.

An emphasis has been made on the need to link disaster mitigation measures with developmental plans, effective communication systems, use of latest information technology, insurance, extensive public awareness and education campaigns. This can be done only through the strengthening of institutional mechanisms, international cooperation, and the involvement of the private sector.

The report looks at diversification of land systems as a strategy for providing insurance against risks caused by unexpected weather and erosion, while ensuring sustainable production

of the land on a long term basis. It also looks at agro forestry, a technique of growing food crops in association with woody perennials, to optimize the use of natural resources and minimizing the need for inputs derived from non renewable resources. A form of multiple units land management, agro forestry has the potential to ensure stability and sustainability in production and provide ecological and economic security. The method can control soil degradation, desertification, floods, droughts, reduce pollution of groundwater, increase biodiversity in farming systems, check deforestation, reduced pressure on forests through on farm supply of fuel wood, fodder and other forest products.

The following were other brief guidelines for prevention and mitigation of disasters –

1. Take a proactive approach by emphasizing means to prepare for and prevent disasters thus reducing its effects on human life.
2. Examine the relation between environmental degradation and vulnerability to disasters, and their combined effects on both natural and manmade habitats that will assist in creating long term prevention and mitigation plans.
3. Utilize remote sensing data while conduction risk analysis and mapping.
4. Adopt as a point of policy retrofitting of buildings and structures as a component of disaster management and earmark funding for the purpose.
5. Create a knowledge base by linking with disaster research and education institutions to create a space for collaborative strategic thinking that can allow continuous revision of disaster prevention and mitigation plans.
6. Initiate research that will collate local traditional disaster knowledge. This knowledge should be studied and examined alongside disaster information and scientific knowledge to create better prevention and mitigation plans.
7. Record data about disaster events in a structured and systematic manner so that current measures and plans can be evaluated for effectiveness and amended as needed.
8. Apply meteorological, climatological and hydrological knowledge in the area of disaster management that will assist in the assessment of risk, land-use planning and the designing of structures that greatly contribute to disaster mitigation.
9. Take into account the cascading nature of disasters to create more effective prevention and mitigation strategies.
10. Identify and strengthen existing centers of excellence in order to improve disaster prevention, reduction and mitigation capabilities.
11. Create a culture of prevention by introducing measures for intensive training for building up of human resources to improve disaster awareness and capabilities.

12. Initiate public disaster awareness and training programs that cater to the needs vulnerable groups like women, children, elderly and disabled to build up society's resilience towards disasters.
13. Community mobilization in disaster situations is extremely important. To facilitate this Panchayats and Urban Local Bodies should be involved in activities towards community level coordinated action, disaster mitigation education etc.

4.2 Hazard Specific Mitigation Measures

4.3 Earthquake

An earthquake is a violent and sudden shaking of the earth's crust due to collusion or breaking or moving away of tectonic plates at the top of which the whole of human civilization is perched. The joining of the tectonic plates is known as fault-lines and where the disturbances weaken the surface of the plate almost to the breaking point is known as sub-surface fault lines. The earthquake is caused by the release of energy through these fault lines and sub-surface fault lines. The intensity of this energy ranges from 0 to 10 and is measured on Richter scale.

The typical impact of the tremor known as earthquake varies from its intensity to intensity and the distance of the area from its epicenter. It ranges from shaking of structures to the changing of very landscape. Its typical impact is in the form of physical damage, destruction of infrastructure and loss of property. Physical damages may be in terms of damages or destruction of structures or damages or destruction by fire or floods due to dam failures caused by earthquake. Casualties will be due to damage or destruction of structures etc. It will be much higher in areas nearer to the epicenter and densely populated area with weak buildings traditionally constructed with earth, rubble, bricks etc; urban settlements in poorly constructed apartments and in proximity of high rise buildings.

4.3.1 Prevention and Mitigations Measures

In case of Earthquake as a hazard no prevention measures are there to be taken. However, mitigation measures for Earthquake impact reduction are there to be taken. They consist of structural and non-structural measures.

Structural Measures: The prime structural mitigation measures that are expected to considerably reduce the impact of earthquake are:

- Conduct micro-zonation study and create seismic map in earthquake prone location.
- Identify the vulnerable structure.

- Adopt the building code and suggestion given by the micro- zonation study and Properly designed, engineered and constructed structures — residential, service or infrastructure — built on well tested soil for adapting to suitable adjustments in design.
- Retrofitting in old structures so that short-comings in construction could be externally strengthened to a considerable extent to withstand the convulsions caused by Earthquake.

4.3.2 Non-Structural Measures

For getting the structural measures implemented with due earnestness, honesty of purpose and sense of compulsion host of non-structural measures in the form of policies guidelines and training have to be provided.

- Policy decisions about construction of structures with due approval from specified authorities have to be taken. The building codes etc have to be suitably formulated/ amended and appropriately detailed and legal implications properly stated.
- Guidelines both for earthquake-resistant constructions as well as for retrofitting have to be formulated with specifications about site selection, foundation, construction, materials and workmanship making involvement of specialist architects, trained engineer and masons mandatory.
- The guidelines have to be formulated for the concerned authorities about land use planning, monitoring of construction work and controlling of settlements in hazard prone areas to avoid fatalities and loss of property.

4.3.3 Mitigation Strategy

The desired implementation of mitigation measures requires a well thought strategy. Implementation of mitigation measures, therefore, has to be multi-pronged: adoption wise attractive and cost wise comfortable.

The Strategy for mitigation measures for the typical effects of earthquake involves.

- Training of A, B, C, D, E, F, G, H and M; Architects, Builders. Contractors, Designers, Engineers, Financers, Government functionaries and masons.
- Awareness generation among the house owners about what details to look for or insist upon about the building, household fittings and equipment, in the houses they own or intend to purchase.

- Computer based information dissemination about the area-wise nature of soil, the kind of construction appropriate in the area, the certifications about the house/flat one is about to buy.
- The empanelment of specialist architects, trained engineers and masons by urban bodies and works departments for building earthquake resistant structures.
- The Certification of commercial buildings by Fire Dept and urban regulatory bodies both at the planning and completion stages.

But, all these put together shall not be sufficient to make mitigation measures people-centred and motivating enough to observe norms. It can, however, be done through

- Awareness among the stakeholders about the need to build/rebuild earth quake resistant houses/structures and keeping safe neighborhood.
- Capacity building of Architects/Engineers/Builders and even masons for construction of earth quake resistant houses/structures.
- Formulation of suitable building bye laws in urban areas and enforcement thereof.

4.4 Flood

Floods are temporary inundations of land with water caused by rains, overflowing of rivers, discharges released from large reservoirs, cyclones, tsunami, melting of glaciers and sea tides. It may come gradually and take hours and days together to recede or may even happen suddenly due to heavy rains, breach in embankments, failure of dams, cloud bursts, storm surge etc. Except for flash floods, there is usually a reasonable warning period.

Floods are caused by either overflowing of rivers due to excessive rains in its catchment or excessive discharge released from reservoirs. The floods cause either breach in embankments or excessive erosions. As chance would have it, out of the four causes and consequences of floods- excessive rains, excessive discharge, excessive erosion, siltation and breach in embankments- only two of them can control and manage. The rest of the two are beyond the control of the administration. The district can however control excessive erosion, siltation and breach in embankments.

Normally, floods are quantified and analyzed on the basis of depth of water and duration for which flood water stays. Velocity of water causes erosion of river banks and– or destroy and damage habitations and other structures. Rate of rising of water level and timing of floods vis–a–vis agricultural activities determine damages resulting from floods.

The damages caused by floods consist of the flooding of land leading to-

- Crop damage, collapsing of mud houses, buildings, endangering human lives,
- Livestock and other public and private property.
- People, standing crop and livestock are liable to perish by drowning.
- Utilities such as sewerage, water supply, communication lines, road network and power supply get damaged, disrupted or destroyed; clean drinking water becomes scarce.
- Food shortage is caused due to loss of harvest and spoiling of stored grains.
- The agriculture gets affected due to deposition of coarse sand layers over the ground or onset of salinity or water logging for considerably long period.

On the whole, floods damage houses/ human settlements/crops/infrastructure, endanger human and cattle lives, fragment families, destroy wealth, jeopardize livelihood base and causes migration. It literally wipes out the socio-economic development achieved so far in the state and drives it to rewrite everything and begin from the beginning: response, relief, restoration, rehabilitation, reconstruction, and redevelopment are needed on a very large scale. All precious investment is reduced to almost naught. All precious efforts made before go largely waste.

4.4.1 Flood Mitigation Measures

The flood mitigation measures may again be structural or none—structural. Mapping of flood prone areas is a primary step involved in reducing the risk of the region. Historical records give the indication of flood inundation areas and the period of occurrence and the extent of the coverage. The basic map is combined with other maps and data to form a complete image of the flood-plain. Warning can be issued looking into the earlier marked heights of the water levels in case of potential threat. In the coastal areas, the tide levels and land characteristics will determine areas liable to inundation. Flood hazard mapping will give the proper indication of water flow during floods.

4.4.2 The structural mitigation measures

- The revival and maintenance of traditional practices of dam, reservoir and ponds system for diverting and storing flood water and making use of the same for multipurpose activities including irrigation, restoration of water tables etc. For this, larger involvement of senior citizens from the local areas will be required who have better understanding and knowledge about the system.
- The conversion of rivulets and tributaries into reservoirs for storing flood water for a desired period and for later use. For this, major river-based GIS mapping would be required.

Besides the bed of the rivulets and tributaries would have to be properly structured and meticulously maintained.

- Using base flow and flood flows of the perennial rivers to generate hydroelectricity by putting generating units of 5 MW, 10 MW or even 20 MW may be planned. This will help both better river management as well as water conservation for productive utilization. As it is, we take care of and maintain anything which is productively utilized. Thus, if we start generating power, the rivers will in the process get maintained and managed.
- Attempt to modify Dams and Reservoirs, Embankment, Drainage Improvements, Channel Improvements, Diversion of Flood Waters and Using Natural Detention Basin.
- Storing Flood Water in reservoirs may help in reducing flood intensity, but the sedimentation caused by the stored flood water may subsequently reduce the capacity of the reservoir. As such, smaller reservoirs are often better choice than larger ones. For, then desilting of small reservoir becomes possible and can be undertaken periodically by the beneficiaries themselves.
- Channel Alterations help in reducing the gushing of flood water and these should again be done with provisions for regular maintenance of the slopes in the channel, removing of debris and other obstructions, using natural vegetation for strengthening the sides of the channels and for using it as a source of promoting fisheries etc.
- Watershed Management measures reduce overland runoffs from agricultural lands to streams or other water bodies by improving infiltration of rainfall into the soil, minimizing run-off and reducing the sedimentation that can clog stream channel or storage reservoirs. The measures to avoid it include maintaining trees, shrubbery and vegetative cover, slope stabilization etc.

4.4.3 Non- Structural Measures

- Attempts to modify susceptibility of Flood. Flood plain zoning: It aims to regulate the developments in the flood plains, so that it is compatible with 'Flood Risk'. It recognises the basic fact that the flood plains are essentially the domain of the river, and as such all developmental activities must be compatible with the flood risk involved.
- Flood forecasting : Involves observing and collecting hydrological and meteorological data, transmission and then processing the data with a view to work out the likely level to be achieved at a particular site, i.e. to give advance warning. Stay in touch with IMD and CWC. Establish infrastructure for flood warning and dissemination.

4.4.4 Measures to be adopted at District Level

Following measures should be taken at District level by the collector on whom the implementation of DDMP rests. Action plan of relevant line departments should be put into order.

- Convening a meeting of District Level Disaster Management Committee before the onset of monsoon in the month of April/early May.
- Arrangement for functioning of control room. Specific charge should be given at Taluka level to listen to weather bulletins from radio and television to monitor the warning relevant to the Taluka.
- A joint inspection team at Taluka level will inspect river embankments in the month of March and April. A summary report will be sent to the Sub-Division and District accordingly.
- When monsoon breaks, District will send the daily/ weekly report regularly from the report received from village and gram panchayat levels and to the Sub-Divisional Officer. Dissemination of weather report and flood bulletins to lower level.
- Installation of temporary police wireless stations and temporary telephones in flood prone areas. Identification of the owners of country mechanised boats with address and contact numbers.

4.5 Drought

Drought is a creeping disaster. Its onset is difficult to demarcate and so also its end. Delay in the arrival of monsoon, failure of monsoon, irregular and scanty rainfall during kharif, falling of groundwater level, drying of wells and reservoirs and deficit in paddy plantation indicate the onset of drought. Generally non-structural and, therefore, difficult to quantify on immediate basis. Its spatial extent like that of floods denotes its severity.

The fall in groundwater level, less food production, availability of less fodder for animals, migration of labourers, water crisis determines its long-term impact. Its impacts like those of floods are cumulative and its continuance over a period or season magnifies the impact manifold.

Drought unlike other hazards does not cause any structural damages. The typical effects include loss of crop, livestock, timber, fishery production, food shortage, dehydration, loss of life, increased poverty etc. In fact, the impacts of drought are generally categorized as economic, environmental and social.

- Economic impacts denote loss of production in farm sector and also in nonfarm sectors like- forestry, fisheries, poultry, livestock because they depend upon surface and sub-surface

water supplies. These losses result in loss of income and purchasing power among those rural people who depend on these for their livelihood. The processing industries based on agro- products suffer losses due to reduced supply of agro-products or supply at enormously increased prices and losses both in primary and secondary sector result in unemployment, loss in revenue etc.

- Environmental impacts are seen in the depletion of flora and fauna due to reduced availability of water both for feeding and drinking the wild life habitats with the loss of forest cover, migration of wild life and their increased mortality due to preying by starving population. Continuance of drought for a longer period may result in the loss of biodiversity.
- Social impacts are seen in the large scale migration of the population from the drought affected areas to areas less affected, thereby causing dissensions. Children prefer doing some wage earning rather than going to school. People start selling their possessions to manage two times meal for the family. The social status and dignity get compromised. Inadequacy of food supply causes starvation. Inadequacy of water supply generates social conflict. Thus the social capital and moral economy, the woof and warp of social fabric, is tattered and reduced to pieces.

4.5.1 Drought Mitigation Measures

4.5.2 Structural Measures

Water Management: In the land of flooding rivers, if drought is a recurring feature then surely, it is a clear-cut case of poor water management.

- Keeping in view the drainage and irrigation as interdependent to maintain the quality of soil, following water conservation related measures are required to be taken in drought prone areas.
- Maximising efficient use of available surface and groundwater in drought prone areas i.e. to resort to drip and sprinkler practices wherever possible, particularly for commercial crops including fruit orchards.
- Construction of underground reservoirs to escape the impact of evaporation.
- Conservation of floodwater in the branches of mainstreams and the network of rivulets.
- Creation of Anicuts or check dams to hold water in the river beds and make it flow through the canals for irrigation purposes.
- Revival of dam, reservoir and pond systems of the past and maintain the same.

- Digging of recharge wells and water harvesting structures to conserve water through rain water harvesting and by developing the culture of roof water harvesting in each household.
- Spring water harvesting by diverting hill streams through small excavated channels, called KULS for irrigation and domestic use.

4.5.3 Soil Management

The other factor responsible for drought conditions in Bihar is the nature of soil for which the first and foremost measures to be taken are:

- The use of organic fertilizers which not only enriches the soil with minerals but also slowly but surely enhances its water holding capacity. Besides, the use of organic fertilizer gets better values of the products in the market, specifically in the developed countries.
- Afforestation which helps in both water and soil conservation. Such plants that have shorter growing period should be preferred. It helps the soils in enhancing its capacity to hold water and prevents erosion. It is also said to be the best method to contain the spread of drought.

4.5.4 Crop Management

The third factor responsible for agricultural drought is kind of cropping being done. There are cropping patterns that help in soil conservation as well as in getting better farm yield. They are:

- Strip cultivation: Consist of cultivation of different crops in different strips simultaneously.
- Cover Cropping: In plantation fields where gestation period of trees is long., creeper crops are planted which spread fast and provide cover to the top soil and thereby conserve it.
- Crop rotation: Instead of grooming the same crop in the same field every year which tends to exhaust the same kind of mineral in the soil, as well as the moisture content in the soil. By rotating different types of crops soil fertility and moisture contents both are preserved.
- Alternate cropping: In deficit and/or irregular rainfall situations, alternate crops requiring less irrigation like bazra, need to be sown.

4.5.5 Introduction of modified Crop insurance

Disaster management is an integral part of agriculture and a well functioning insurance scheme is the only answer. Response to disasters through NCCF and CRF has failed to adequately address to the problem of agrarian distress due to vagaries of nature. National

Agriculture Insurance Scheme (NAIS) even in the modified version fails to address this issue – indemnity levels are low, threshold levels are unrealistic, premium rates are high even after subsidy, crop compensation is unsatisfactory.

- To mitigate the drought and market risks, a farmer friendly crop insurance scheme through private insurance companies would be introduced for all major crops where the development cost of insurance product would be shared by the State Government. Scheme being an area insurance scheme amounts to a car insurance scheme when the owner would get compensation only when certain number of cars also meet accident before the owner gets the compensation.

4.5.6 Non- Structural Measure

Along with the structural measures, non- structural measures are necessary to implement. Sometimes implementation of the structural measures are not possible due to funding issues on that scenario a strong ground for non- structural measures can prevent the drought scenario on greater extent. The different kind of measures can be adopted by the states are:

- Working towards convergence of lessons learnt from studies carried out by multiple institutions working in related fields such as Central Research Institute for Dry land Agriculture (CRIDA), Agriculture Institute, India Meteorological Department (IMD), National Remote Sensing Centre (NRSC) and Indian Council for Agricultural Research (ICAR), etc.
- Impact of drought on agricultural economy should be assessed in terms of indicators like area sown, input use, livestock, crop yield, farm and overall income, employment and migration of families.
- Impact of drought on the poor in urban areas should also be assessed.
- Great stress be laid on preventing deterioration in quality of life during drought.
- Drought mitigation measures should be strengthened with the help of the on-going communication revolution. Remote sensing techniques should be used extensively for drought assessment and mitigation. Satellite data may be used to target potential ground water sites for taking up well digging programmes.
- There should be adequate accountability of drought management authorities at all concerned levels of administration. There should be proper monitoring, assessment and evaluation of actors taken by the authorities.

- Agricultural extension agencies should be effectively involved in drought mitigation efforts; these agencies should remain very alert during the period of drought and should be strengthened in drought prone areas.
- Timely and adequate supply of inputs like drought resistant seeds by the concerned authorities should receive emphasis.
- There should be Water Availability and Outlook Committee and Impact Assessment Committee at local levels.
- Capacity Building program for different group of people at different level, like- arrange demos on drip and sprinkle irrigation and water harvesting for farmers at drought prone areas.
- Encourage farmers to adopt crop pattern development programs.
- Arrange awareness program regarding drought at different level.

4.6 Cyclone

Cyclones have the best predictability among all disaster phenomena. Low pressure and the development can be detected hours or days before its damage effects start. Satellite tracking can track the movement since the build up and the likely path is projected.

National Cyclone Risk Mitigation Project (NCRMP) Initiative: Recurrent cyclones account for a large number of deaths, loss of livelihood opportunities, loss of public and private property, and severe damage to infrastructure, thus reversing the developmental gains whenever disasters occur.

It is difficult to predict the accuracy. Accurate landfall predictions can give only a few hours' notice to threatened populations. In addition, people generally opt to wait until the very last minute before abandoning their home and possessions. Deaths from drowning in the high tides and sudden flooding and material losses are therefore often very high. Forecasting is the next step in disaster reduction. But forecasting should be based on sound scientific principles and operationally proven techniques.

4.6.1 Cyclone Prevention and Mitigation Measures

4.6.2 Structural Measures

Like flood there are few things controlled by the human being. Basically making cyclone shelter is main preventing measures to prevent the losses due to cyclone.

- Construction of cyclone resistant houses and strengthening of existing houses should be done through community participation. Local engineers and masons can take part in the construction of the buildings in their area and demonstrate to the people about disaster resistant construction methods.
- Multipurpose cyclone shelters should be used as schools or community centers in normal times. In case of cyclone or floods, community should take shelter in these designed buildings.
- Consider the orientation of the site. Shelter behind the hills from prevailing wind direction.
- Road links, culverts and bridges ,

4.7 Fire

Fires are the accidents which occur most frequently. It has whose diverse causes that require a range of intervention methods and techniques adapted to the conditions and needs of each incident. The fire risk can arise either from industrial processes, accidents in storage godowns or closely built timber framed buildings

Depending on the type of fire (nature of the material ablaze), meteorological conditions (wind) and the effectiveness of the intervention, material damage can be limited to a small area, or affect wide areas like forests or agricultural fires, hydrocarbons, gas or other highly flammable products, storage or piping installations, and rail or marine transport equipment. Fires are an important disaster to focus on as they can arise in response to other disasters like earthquakes or landslides. As fire disasters can be primary or secondary focus has to be on ensuring that fire services are able to respond despite disturbances caused by another disaster that has just occurred. As a part of mitigation strategy, efforts should be made to

- Make fire fighting services available to rural areas outside the local municipal limits.
- Assist municipal authorities that don't have fire brigades to establish such a service.
- Encourage agricultural marketing committees and cooperatives in rural areas to establish their fire services.
- Evolve methods of coordination between municipal fire services and industrial safety departments.
- Undertake community education and preparedness for fire fighting in areas where fire services will not easily available.
- In industrial towns, fire services should be equipped with protective clothing and fire fighting devices including masks, gloves etc. for dealing with chemicals and toxic materials.

- Special burns wards should be established in every civil hospital and in the hospitals near the industrial estates.
- Equipping fire services with communication facilities like wireless etc. and wherever such facilities exist, these should be upgraded.
- Computerized data management system should be introduced to keep the record of all fires including frequency, extent, fatality, economic losses etc.
- The roles and responsibilities of district administration, police, fire services and medical services should be clearly laid down.

4.8 Epidemics

An epidemic is the rapid spread of infectious disease to a large number of people in a given population within a short period of time, usually two weeks or less. An epidemic can be the consequence of other disasters like storms, floods, droughts etc. Strengthening surveillance programmes and warning systems go a long way in controlling epidemics.

Steps towards mitigating the risks from epidemic include the following –

- Identification of areas endemic to certain epidemics must be routinely updated to access field requirements.
- Identification of appropriate locations for testing laboratories.
- Ensuring continuous flow of field data from both government establishments and private medical personnel.
- Collating and analysing the data at regular intervals to assess epidemiological monitoring requirements.
- Creating awareness among the general population to encourage preventive measures that can help in controlling epidemics.
- Quality monitoring of piped drinking water supply and water.
- Vector Control programmes as a part of overall community sanitation activities which include surveillance of water bodies and canal distribution network for control of diseases like malaria.
- Promotion of personal and community latrines.
- Introduction of sewage, drainage and solid waste management systems.
- Promoting and strengthening community hospitals with adequate network of para professionals to improve the capacity of the Public Health Department (PHD) for surveillance and control of epidemics.
- Establishing testing laboratories at appropriate locations in different divisions within the districts to reduce the time taken for diagnosis and subsequent warning.

4.9 Industrial and Chemical Accidents

Industrial and chemical accidents refer to incidents originating from technological or industrial accidents, dangerous procedures, infrastructure failures or certain human activities, which may cause the loss of life or injury, property damage, social and economic disruption or environmental degradation.

- Major accidents involving chemical substances have local effects, but in some circumstances they can affect whole regions because of factors like the weather conditions during the time of the accident. Prevention of such incidents must be the priority, but a positive result can only be assured if there are strict guidelines for using and handling of dangerous chemicals.
- When an accident involving chemical substances that could endanger life or the environment occurs in a chemical works or installation, those in charge of it should implement the safety measures which will minimise its consequences.
- They should immediately inform the relevant local authorities of the accident who will be responsible for informing the public and deciding upon the instructions to be followed by them.
- The co-ordinated use of the civil and military means required to deal with the disaster should be ensured.
- All industrial concentrations should be encouraged to establish MARG for management of industrial accidents.Industries involved in the production or transportation of inflammable, hazardous and toxic materials should have a mandatory responsibility for preparing an off-site plan and communicating the same to the District Collector. Simulation exercises should be undertaken in the adjoining communities.
- Poison centers should be established in every civil hospital and in the hospitals near the industrial estates with facilities for detoxification.
- All transport of hazardous and toxic materials should be communicated to the RTO.
- All pipelines carrying hazardous and toxic materials should be equipped with devices to check any leakage or metal fatigue.
- Small-scale industries releasing toxic wastewater should be encouraged to set up common effluent treatment facility.
- A common format for chemical data sheets should be devised which should be used to collect information from all industries in the district and the same should be available with fire brigade and police.

4.10 Disaster Prevention and Mitigation Measures

Mitigation Measures/ Activities and Responsibility of line departments at various stages of Disaster Cycle of Various Hazards

4.11 Flood

Task	Activities	Responsibility
Development of techno-legal regime/ regulations	➢ Prohibition of development in wetlands, flood zone and low lying areas. ➢ Encourage for flood proofing structures in flood prone areas. ➢ Build new water and sewage systems and utility lines. ➢ Prescribing standards for different flood prone zones on flood plains ➢ Enactment and enforcement of laws regulating development activities in flood plain. ➢ Specific building by-laws for flood plains.	➢ Revenue Dept. ➢ Irrigation Dept. ➢ UD Dept. Panchayat and Rural Housing ➢ Local Governments ➢ PWD

4.11.1 Safe dwelling in flood hazard areas

Task	Activities	Responsibility
Arrangement of safe dwelling in flood hazard areas	➢ Development of flood hazard map. ➢ Study of past history on floods occurred and estimated loss and damage ➢ Asses the vulnerability of risk elements Build houses in safer zones	➢ Revenue Dept. ➢ Irrigation Dept. ➢ UD Dept. Panchayat and Rural housing. ➢ Local Governments. ➢ PWD

4.11.2 Development and Redevelopment Policies

Task	Activities	Responsibility
Development and redevelopment of flood preventive policies	➢ Develop long term flood policies to protect natural resources, property and lives. ➢ Legislative & regulatory requirements	➢ Revenue Dept. ➢ Irrigation Dept. ➢ UD Dept. Panchayat & Rural Housing ➢ Local Governments ➢ PWD

4.11.3 Modifying floods

Task	Activities	Responsibility
Modifying flood by construction works	➢ Construction of dams and reservoirs, dikes, levees, and floodwalls, channel alterations, high flow diversions, storm water management, coastline protection works and watershed management. ➢ Development of catchment area of the flood plain. ➢ Forestation and vegetation. ➢ Land sloping and small check dam construction	➢ Revenue Dept. ➢ Irrigation Dept. ➢ UD Dept. Panchayat & Rural Housing ➢ Local Governments ➢ PWD

4.11. 4 Flood Forecasting and Warning System

Task	Activities	Responsibility
Updating of flood forecasting and warning system	➢ Strengthening and up gradation of existing flood forecasting system ➢ Stay in touch with IMD and CWC. ➢ Establish infrastructure for flood warning and dissemination. ➢ Ensure proper communication between district authority and SEOC.	➢ DDMA Authority ➢ Irrigation Dept. ➢ CWC ➢ IMD

4.11.5 Non-structural Measures

Task	Activities	Responsibility
Capacity Building	➢ Prepare departmental flood contingency plan ➢ Establish rain gauge recording station with trained manpower in the state ➢ Train the flood rescue teams and ensure they have functional rescue materials.	➢ Revenue Dept. ➢ DDMA Authority ➢ Irrigation Dept. ➢ Line Dept.
	➢ Conduct demos/ mock drills in flood prone areas time to time and ensure that rescue teams are properly trained and equipped ➢ Organize trainings for various stakeholders involved in flood mitigation and management ➢ Organize mock drills on flood rescue	
Awareness Generation	➢ Undertake public awareness activities in flood affected areas and let people know what to do and what not to do after, before and during flood.	➢ Revenue Dept. ➢ DDMA Authority ➢ Irrigation Dept. ➢ Information Dept. ➢ Line Dept.

	➢ Design and develop the IEC materials in local language and ensure their storage and distribution among people. ➢ Motivate all families in flood prone areas to prepare the family kit of emergency materials	

4.12 Earth quake

4.12.1 Structural measures

4.12.2 Zoning and Building codes

Task	Activities	Responsibility
Zoning and Building codes	➢ Conduct micro- zonation study and prepare seismic map in earthquake prone locations ➢ Identify the Vulnerable structures. ➢ Adapt building code and suggestions given by micro zonation study and do construction works accordingly.	➢ Revenue Dept. ➢ DDMA ➢ UD Dept. ➢ PWD Dept. ➢ Gram Panchayats ➢ Local Urban Bodies ➢ Housing Dept.

4.12.3 Development of safe siting and Earthquake Resistant Structure

Task	Activities	Responsibility
Safe siting in earthquake areas.	➢ Select rock or stiff soil for building construction ➢ Avoid constructing the capital-intensive infrastructure, hazardous facilities and important buildings in Seismic fault areas.	➢ Revenue Dept. ➢ UD Dept. ➢ PWD Dept.
Develop earthquake resistant structures	➢ Adopt earthquake resistant structure in all construction works. ➢ Incorporate the earthquake resistant design in all houses build by government departments and private agencies	➢ Gram Panchayats ➢ Local Urban Bodies ➢ Housing Dept.

4.12.4 Retrofitting of weak structures

Task	Activities	Responsibility
Retrofitting the weak structures	➢ Develop a database of existing private and govt. building in the state. ➢ Identify the buildings need retrofitting. ➢ Prepare a project/scheme for retrofitting.	➢ Revenue Dept. ➢ UD Dept. ➢ PWD Dept. ➢ Gram Panchayats ➢ Local Urban bodies ➢ Housing Dept.

Avoid use of very weak/ risk structures	➢ Identify the very weak/ old structure ➢ Put notice not to use and vacate	

4.12.5 Instrumentation for monitoring of seismic activity

Task	Activities	Responsibility
Regular monitoring of seismic activities	➢ Set up seismic recording stations in seismic prone areas with modern equipment's ➢ Ensure regular study and research work in this field by technical groups ➢ Ensure dissemination of data and information to all concerned	➢ Science and technology Dept. ➢ Local urban bodies

4.12.6 Non-structural measures

Task	Activities	Responsibility
Capacity Building	➢ Strengthening of Techno-legal regime. ➢ Organize trainings on earthquake resistant structures for engineers, architects, masons and other working in construction industry. ➢ Prepare departmental earthquake contingency plan, action plan and SOP	➢ Education & technical Education Dept. ➢ Revenue Dept. ➢ DDMA ➢ Line Dept.

	➢ Carry out structural safety audit of all critical Infrastructures and key resources. ➢ Motivate disaster insurance of buildings. ➢ Improvement of emergency response.	
Awareness Activities	➢ Organize school programs, public awareness campaigns on earthquake safety. ➢ Organize Drop. Cover Hold demo in Schools. ➢ Develop IEC Materials and distribute	➢ Information Dept. ➢ DDMA

4.13 Drought

4.13.1 Structural Measures

Task	Activities	Responsibility
Water management construction works	➢ Construction/ repair/ strengthening of dams, reservoirs, lift irrigation, water sheds, tube wells and canals for surface irrigation. ➢ Construction/repair/strengthening of percolation tanks, farm ponds, check dams etc. ➢ Construction/repair/ strengthening of warehouses and cold	➢ Revenue Dept. ➢ Irrigation Dept. ➢ Agriculture Dept.

	storages for preservation/ storage of food grains	
Soil management	➢ Use of organic fertilizer to enhance water holding capacity of soil. ➢ Prefer shorter growing period plants.	➢ Agriculture Dept.
Crop management	➢ Adaptation of strip cultivation of different crops. ➢ Adaptation of Cover cropping to moisture the soil for long period. ➢ Do crop rotation for soil fertility and moisture contents.	➢ Agriculture Dept.
Adaptation of new technology	➢ Application of advanced agro- science technology and agro engineering inputs to improve agriculture production.	➢ Revenue Dept. ➢ Agriculture Dept.
	➢ Adaptation of new technology for water harvesting and watering crops. ➢ Undertake programs to motivate farmers to change crop patterns, and follow alternative livelihood sources.	

Techno-legal regime	➢ Enactment and enforcement of laws regulating ground water level and exploitation of natural resources. ➢ Do insurance for all crops.	➢ Revenue Dept. ➢ Agriculture Dept.
Forecasting and warning	➢ Strengthening the existing drought forecasting system. ➢ Establish infrastructure for drought warning and dissemination	➢ Revenue Dept. ➢ DDMA ➢ Irrigation Dept. ➢ IMD

4.13.2 Non-Structural measures

Task	Activities	Responsibility
Capacity Building	➢ Develop departmental drought contingency plan, action plan and SOP. ➢ Provide training on drought mitigation and management to all stakeholders. ➢ Arrange demos on drip and sprinkle irrigation and water harvesting for farmers. ➢ Encourage farmers to adapt crop pattern developed for drought prone areas. ➢ Rational use of fertilizers and pesticides. ➢ Motivate farmers to adapt the technique for preservation of green folder.	➢ Revenue Dept. ➢ Irrigation Dept. ➢ Agriculture Dept. ➢ Forest and Environmental Dept. ➢ Rural Development ➢ All Line Dept.

Awareness	➢ Aware general public on drought consequence and provide tips on water conservation, drought resistant crops, new technology, off-farming activities and alternative livelihood sources. ➢ Aware farmers about government schemes and insurance Policies for crops, animal husbandry, fishery, horticulture etc. ➢ Make exposure visits of farmers to observe new technology, and off-farming business.	➢ DDMA ➢ Revenue Dept. ➢ Irrigation Dept. ➢ Agriculture Dept. ➢ Information Dept. ➢ All line Dept.

4.14 Fire

4.14.1 Structural Measures

Task	Activities	Responsibility
Develop fire infrastructure and other fire facilities	➢ Extend coverage of fire and emergency services to rural areas. ➢ Involve the new stakeholders ➢ Strengthen coordination between municipalities and industrial safety department. ➢ Equipment fire stations with modern fire engines and other equipment's. ➢ Provide fire proof devices to fire fighters. ➢ Insurance coverage for fire staff. ➢ Make provision for special fire burn ward in the hospital. ➢ Ensure that all fire stations are connected to effective communication system.	➢ Fire and emergency services dept. ➢ Industrial safety department ➢ Urban local bodies ➢ Health Dept.

4.14.2 Non-structural measures

Task	Activities	Responsibility
Capacity Building	➢ Impart fire management training to fire staff and strengthen their working skill. ➢ Organize regular demo for fire brigade to familiar them with fire equipment's ➢ Conduct mock drills to check up the departmental preparedness.	➢ Urban Development ➢ Disaster Management Unit
Awareness Generation	➢ Organize awareness programs on fire safety in Schools, Colleges and offices. ➢ Disseminate fire safety tips among public through print and electronic media. ➢ Develop IEC materials on dos and don'ts for public distribution.	

4.15 Industrial and Chemical Accidents

4.15.1 Structural measures

Task	Activities	Responsibility
Industrial safety measures	➢ Set up Emergency response Centre (ERC) ➢ Strengthen Mutual Aid Response Group (MARG) ➢ Form and strengthen the crisis Groups at District and local levels. ➢ Industries not to be allowed in Hazard prone areas ➢ Develop on-site and off-site plans. ➢ Set up toxic water treatment facility. ➢ Set up leakage checkup devices. ➢ Purchase, store and keep functional all necessary industrial safety equipment's. ➢ Make Provision for poison ward in Civil hospital	➢ Industrial Dept. ➢ MIDC ➢ District Authorities ➢ Local Authorities
Techno – legal regime	➢ Implement the Acts and Rules related to industrial safety firmly. ➢ Ensure structural safety inspection/audit inspection/audit by competent authority.	➢ Industry Dept. ➢ MIDC ➢ Local Authority

Strengthening EOC and warning systems	➢ Establish/ strengthen EOCs at all level. ➢ Set up on site and off – site warning dissemination system	➢ Nodal Authority ➢ MIDC ➢ Dist. Collector ➢ Municipal Commissioner

4.15.2 Non-Structural Measures

Task	Activities	Responsibility
Emergency Planning	➢ Prepare/ update emergency onsite and offsite plan. ➢ Regular monitoring of safety activities in all the factories/ industries.	➢ NodalAuthority: MIDC ➢ Dist. Collector ➢ Municipal Commissioner
Organize Capacity Building	➢ Organize industrial safety trainings for officers and staff working in the factories. ➢ Set up an on –site and off – site monitoring team to check up all safety measures. ➢ Conduct mock drills in regular interval. ➢ Encourage disaster Insurance.	➢ Nodal Authority: MIDC ➢ Dist. Collector ➢ Municipal Commissioner

Awareness Activities	➢ Organize community awareness programs for the communities residing near the factories and let people know what to do what not to do in case of industrial disaster. ➢ Develop IEC materials on local language and distribute them in schools and local communities. ➢ Organize School level awareness activities and ensure students participation in large number.	➢ Nodal Authority: MIDC ➢ Dist. Collector ➢ Municipal Commissioner ➢ DDMA

4.16 Epidemics

4.16.1 Structural Measures

Task	Activities	Responsibility
Surveillance and warning	➢ Identify the epidemic prone areas ➢ Establish mechanism for regular monitoring of such locations. ➢ Set up testing laboratories with trained manpower if required. ➢ Collect data and disseminate to concerned authorities.	➢ Public health Dept. ➢ Local Govt. Bodies ➢ Municipal Authorities

Preventive and promotive Measures	➢ Ensure clean drinking water, personal toilets, and proper sanitation facilities in epidemic prone areas. ➢ Ensure safe drainage and proper waste management system.	➢ Public health Dept. ➢ Local Govt. Bodies ➢ Municipal Authorities
Strengthening Institutional infrastructure	➢ Organize Capacity building trainings for health staff. ➢ Establish testing labs with modern equipments and trained manpower.	➢ Public Health Dept. ➢ Local Govt. Bodies ➢ Municipal Authorities

4.16.2 Non-structural Measures

Task	Activities	Responsibility
Capacity Building activities	➢ Identify the primary stakeholders of current epidemic. ➢ Organize epidemic management trainings for all stake holders. ➢ Provide necessary safety devices to health staff who manage and work in epidemic areas.	➢ Health Dept.
Awareness Programme	➢ Organize public campaigns to aware them on what to do and what not to do to control epidemic. ➢ Use both electronic & print media to disseminate the safety measures and the actions government taken to check the epidemic.	➢ Health Dept.

4.17 Cyclones

4.17.1 Safe citing and safe construction in Cyclone prone areas

Task	Activities	Responsibility
Safe siting in Cyclone prone areas	➢ Identify cyclone susceptible areas. ➢ Avoid sea shores, hill slopes, river sides and weak and tall trees near house. ➢ Make provision cyclone resistant features in house design and construct accordingly.	➢ DDMA ➢ PWD Dept. ➢ Irrigation Dept
Safe construction	➢ Incorporate Cyclone resistant features in house design and construct accordingly.	

4.17.2 Shelter plantation

Task	Activities	Responsibility
Develop Shelter Plantation	➢ Shelterbelt plantation and mangrove regeneration	➢ Forest Dept.

4.18 Road Accident

4.18.1 Structural Measures

Task	Activities	Responsibility
Strengthening Intuitional capability	➢ Make provisions for special enforcement wing. ➢ Set up traffic posts and trauma care centers on Highways. ➢ Set up hotline and speed monitoring technology. ➢ Keep equipments for removal of accident Vehicles. ➢ Fix a lead agency for monitoring. ➢ Make provision of Special route for hazardous Vehicles.	➢ Transport Dept.
Strengthening Road Infrastructure	➢ Avoid parking at any point on National and state highways. ➢ Make special provision for parking with food, water, fuel and other facilities. ➢ Show excavation locations with barricades. ➢ Put road dividers, speed breakers, information sign boards and men at railway crossings. ➢ Keep machines for removal of debris in emergency	➢ Transport Dept.

Improving Regulations	➢ Insurance regulation. ➢ Strictly use protective materials by two wheeler drivers. ➢ Special rules for school buses. ➢ Training for drivers carrying hazardous materials. ➢ Use blinking lights for Stationary Vehicles.	➢ Transport Dept.

4.18.2 Non – Structural Measures

Task	Activities	Responsibility
Capacity Building	➢ Organize capacity building training to all stakeholders involved in road transport, and traffic management. ➢ Strengthen the management skill of traffic police and RTO staff organizing mock drills in regular interval.	
Awareness Generation	➢ Create Public awareness on road safety, traffic rule, and noise pollution control. ➢ Disseminate the transport rules and regulation among public and the consequences of its violation.	➢ Transport Dept. ➢ Local Governments

4.19 Landslides

4.19.1 Structural measures

Task	Activities	Responsibility
Preventive and protective measures	➢ Treating Vulnerable slopes and existing hazardous landslides. ➢ Restricting development in landslide – prone areas. ➢ Preparing codes for excavation, construction and grading. ➢ Protecting existing developments. ➢ Monitoring and warning systems. ➢ Putting in place arrangements for landslides insurance and compensation for loses. ➢ Creation of landslide inventory. ➢ Selecting landslide hazard zonation methodologies for different scales. ➢ Multi-hazard integration especially integrating seismic hazard. ➢ Prioritization of areas for land slide hazard zonation mapping. ➢ Landslide Risk zonation.	➢ PWD ➢ Revenue ➢ IMD ➢ Police ➢ GSI

4.19.2 Non- structural measures

Task	Activities	Responsibility
Capacity building	➢ Land slide remediation practice. ➢ Research and development; monitoring and early warning. ➢ Knowledge network and management. ➢ Public awareness and education. ➢ Emergency preparedness and response. ➢ Regulation and enforcement.	➢ Revenue Dept. ➢ DDMA ➢ Police

Chapter 5

5.1 Preparedness

5.2 Identification of stakeholders involved in disaster response

Community is the first responders in case of most of the disasters. This shows the importance of VDMP as well as Village Task Force and their training. Local people who can do search and rescue operations should be identified and given training. But not every levels of disasters can be managed by village task force. Highly trained professionals are needed for response. It includes swimmers, divers etc. They can be identified at Taluka level and given training at village level.

Response and evacuation of disabled population is very important as they are highly vulnerable. Training can be given for the rescue workers for rescuing them or evacuating them during emergency. Fire brigade are adequately trained in this and carry people using different cradle carry method, firemen carry method, blanket carry method etc. The Taluka level rescue workers should be trained in it.

Formation of teams

For different activities in Rescue and relief activities different teams should be formed so that the activities can be carried out easily during the time of disasters.

5.3 Forecasting and early warning

Early warning helps to plan the course of recue and relief operations, helps to move the population to safe shelters and also helps to disseminate the knowledge to the public so that mortality rates can be reduced. Early warning system is not available for every hazard. But for most of the hazards early warning can be issued. It includes heavy rain, flood, landslides, tsunami etc. At district level DDMA can receive the early warning from nodal agencies or from other sources and can plan the rescue and relief operations. There are nodal agencies that can give warning for different disasters.

Sr. No.	Hazards	Nodal agencies
1	Cyclones, Floods, Drought	India Meteorological Department
2	Floods	Central Water Commission of the Ministry of Water Resources
3	Landslides	Geological Survey of India
4	Tsunami	Indian national centre for ocean information services

Time period before incident and early warning

Sr. No.	Hazard	Time period
1	Cyclones	Day's
2	Tsunami	Minutes/Hours
3	Droughts	Months
4	Landslides	Days
5	Floods	Hours / Days
6	Heavy Rainfall	Days

After receiving early warning, the information should be disseminated to various departments for preparedness as well as to the public for safety. It is the responsibility of DDMA and TDMA. The informations from nodal agencies or from SDMA ahould be disseminated to TDMA, VDMA, Panchayat office, line department officials and to public based on the ground situation.

The warning can be disseminated through various means such as

1. Telephone
2. Fax
3. VHF
4. Police Wireless
5. Internet (e-mail)
6. Websites
7. Radio/TV network
8. Mobile Phones (SMS)

5.4 Search and Rescue

Search and Rescue operations are an important part of relief activities to save the life of victims. Experts are needed for ding search and rescue operations. Search and Rescue operations are usually carried out by Fire and Safety brigade, Coast Guard, Police, NDRF etc. Also volunteers can also be used for rescue operations if sufficient experts are not available. Training should be given to SAR team and mock drills and exercises should be done regularly.

Preparedness for Search and Rescue will be done based on the type of disaster in the region. In flood, swimmers and divers are more needed. While in building collapse debris removal and tracking the people trapped in the debris is more important.

As part of preparedness, the Search and Rescue teams should be formed in district and Taluka level and training should be given. The team comprises of

1. Fire fighters
2. Police men
3. Coast Guard officers
4. Swimmers
5. Medical professionals.

5.5 Evacuation

Evacuation can be done for those disasters where early warning is available and the level and efficiency of the evacuation will be based on the time availability after forecasting the disaster. Evacuation needs proper planning and preparation or that itself can become hazardous. Evacuation can be of two types. It can be after a hazard where the survivors in a hazardous situation can be evacuated or it can be after an early warning where time period for evacuation will be there.

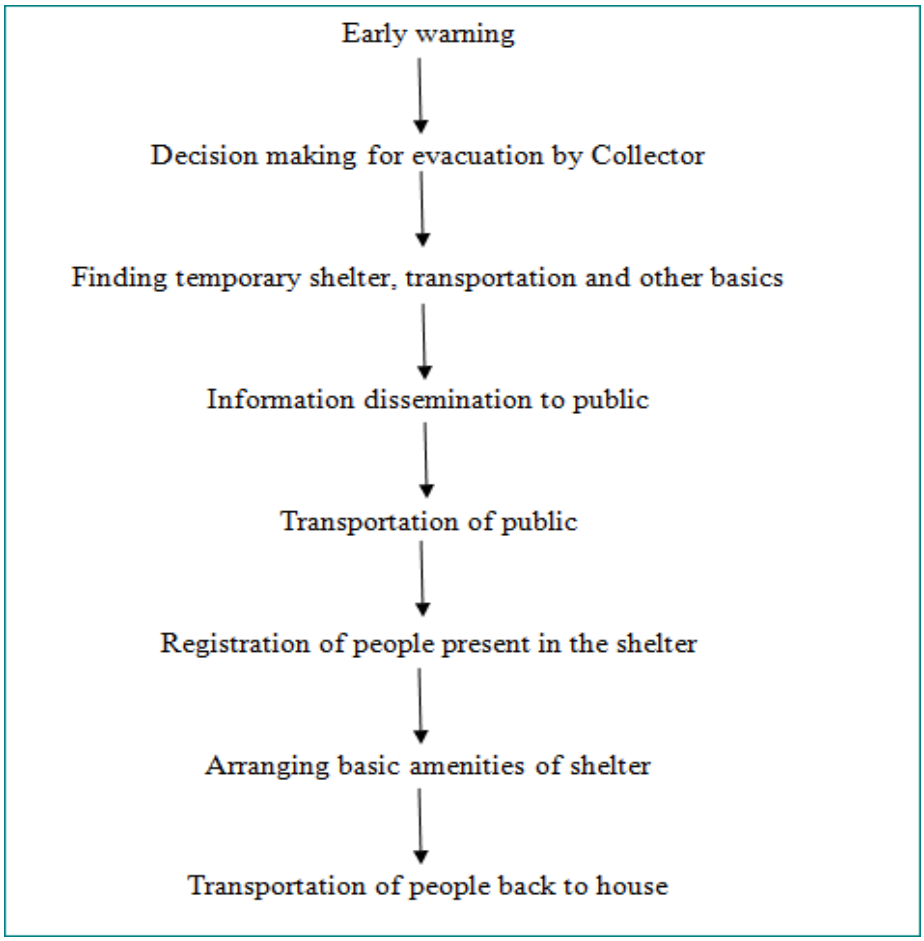


Figure 5.1: Evacuation

For the process of evacuation, temporary shelters should be identified outside the vulnerable location, mostly in schools or barren land (in case of earthquakes). The safety and security of the

temporary shelters should be monitored. In case of vulnerable people like physically disabled, special attention should be given to their needs. Basic amenities such as water, food, sanitation, medical attention etc should be addressed. In case of winters special care should be given. Evacuation procedure will not be completed until relocating the people to safe permanent location or their own place.

5.6 Damage and Loss Assessment

Damage and loss assessment should be done immediately after rescue operations. It helps to understand the extent of damage in the region. Data regarding the following details should be collected, including the extent of damage such as partial or complete.

Type	Number	Remarks
Number of affected population		
Number of affected families		
Loss of life		
Injured		
Missing		
No of house fully damaged		
No. of house partially damaged		
Crops fully damaged (acre)		
Crops partially damaged (acre)		
Fully damaged educational institutions		
Partially damaged educational institutions		
No of water sources damaged/not functioning		
No of latrine damaged		
Loss of livestock's (no.)		
Embankment Fully damaged(km)		
Embankment partially damaged (km		

5.7 Activation of IRS in the district

The District Collector automatically becomes the head or the Chairperson of the DDMA, and hence he is appointed as the Responsible Officer of the district. Some of the responsibilities may be passed on to the Additional District Collector for management and supervision of any incident that occurs in the district, as he is the Chief Executive Officer of the District. The District Emergency Operation Centre and the Incident Commander will make him aware of all the developments and progresses of responses activities in the district. The following chart shows the hierarchical representation of the Responsible Officer in an IRS:

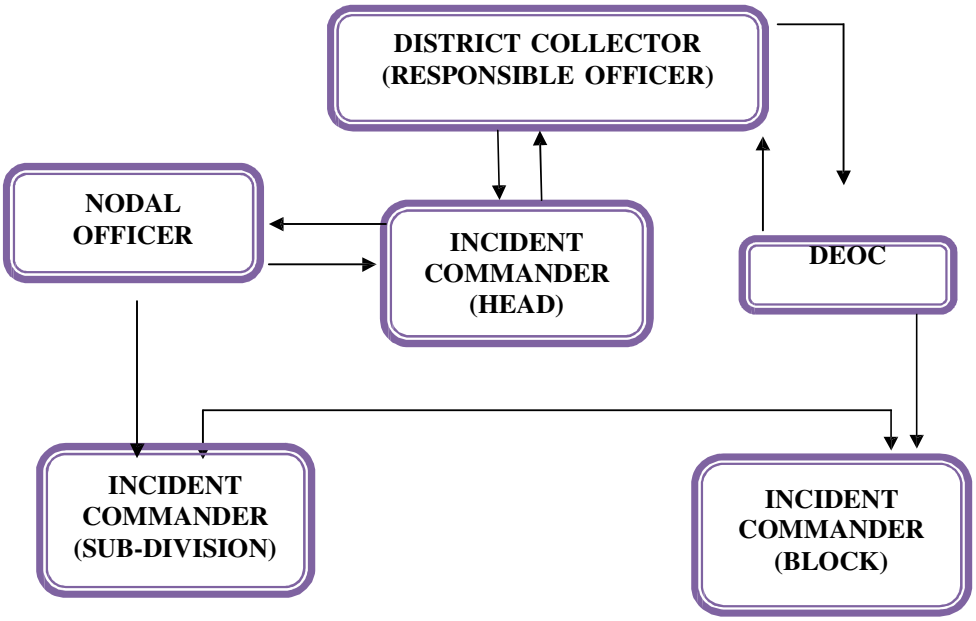


Figure 5.2: Incident Response System

5.8 Protocol for seeking help from other agencies

The line departments and their head will perform different roles and responsibilities based on the nature and kind of disaster. These responsibilities of the line departments shall be clearly defined based on different types of disasters in the DDMP, which will be further approved by the State Government.

5.9 Army, Air Force & Central Paramilitary Forces

The Chairman of the DDMA will report to the State Home Department which will further ask for military help to the Central Home Ministry, who will take the subject with the concerned departments for the requisition of Army, Air force and Central Paramilitary Forces.

5.10 National Disaster Response Force

The DDMA can immediately make arrangements for requisition the NDRF team or battalion directly, if there are cases of sudden onset of disasters in areas, where early warning systems may not be present. The DDMA will maintain a close association with the NDRF Commander in Chief of the NDRF located nearest to the district (Pune), for the rapid deployment of the team in case of threatening disastrous situations.

5.11 State Disaster Response Force

The DDMA will write to the State Disaster Management Authority who will consult further with concerned ministries for requisition of SDRF, if it exists in the State.

5.12 Mechanisms for checking and certification of logistics, equipments and stores

The DDMA will write to the concerned Logistic Section Chief (LSC) in the Revenue Department, to further carry out the responsibility of checking and making certifications of logistics, equipments and stores.

5.13 Operational check-up of Warning Systems and EOC

The DDMA will conduct operational check-ups of warning systems, EOC and also the equipments available at the EOC, periodically. The pre-monsoon preparedness meeting also leads to checking of warning equipments.

5.14 Seasonal inspection of facilities and critical infrastructure

The DDMA shall coordinate along with the Public Work Departments, to conduct a seasonal inspection of facilities and critical infrastructures like bridges and Highways, especially before the onset of monsoons.

5.15 Command and coordination

The head or the Chairperson will coordinate meetings regularly with all the departments and stakeholders and even include various NGO's and groups for effective management and preparedness of summer seasons and monsoons.

5.16 NGO and other stakeholders

The NGO which are working in development sector as well as disaster management sector can be used for different purposes such as Post Disaster Need Assessment. The NGO workers or volunteers should be trained regarding their work during L0 phase of disasters and during the issue of warning, NGO officials can be communicated and can be used. Also in case f temporary shelter preparation, water and sanitation etc can be managed by NGO with the support and monitoring of government officials.

5.17 Seasonal preparedness

The DDMA can make seasonal preparedness by:

- ***Identifying Risks***: Listing out various risks from hazards like floods, fire to the infrastructures and facilities. This will decrease the geographical susceptibility of the structure. Identifying vulnerability of the objects and structures are also an important process of the preparedness. Hence this identification process will focus on the prevention and mitigation of any damages that can take place in the future.

- ***Identifying Resources***: The DDMA shall identify resources available in the district, for assistance in a disastrous situation and sources which can lower the damage and the risks.

- ***Decreasing Risks***: Once the list of risks and vulnerabilities are prepared and specified, then the DDMA shall conduct and formulate a program making arrangement of activities that can decrease the risks. This can be done with the help and association of various line departments.

5.18 Preparedness

IDRN: India Disaster Resources Network
DDMO: District Disaster Management Authority.
SDMD: State Disaster Management Department
DDMD: District Disaster Management Department
DDMA: District Disaster Management Authority

5.19 Community Preparedness

Community preparedness plays a crucial part in disaster management. Community is one seem to be one of the exposed entity in any disaster risk. The two main elements to be explored in the community preparedness are community based and people centric. Community based disaster management is believed to have direct involvement of community in every phases of disaster. It is vital that community members themselves are aware and self reliant in getting the knowledge and information of the risks and vulnerabilities of the area. The core activities where community people could get involved are

Risk Knowledge	➢ Knowledge about historical hazards. ➢ Identification of hazards and disaster prone areas. ➢ Whatare the pattern and frequency of disaster.
Dissemination and communication	➢ Develop community based early warning system. ➢ Dissemination of information to vulnerable communities. ➢ Dissemination of information to person with disability.
Monitoring	➢ Parameters for the development of early warning. ➢ Parameters for structural development and implementation.
Response Capabilities	➢ Take all the prevention, mitigation and preparedness measures. ➢ Capacity building and awareness programs. ➢ Provide support to conduct post disaster assessment studies.

5.20 Sensitization of community about the needs of person with disability

People with disability are some of the most likely impacted groups during any disaster with high risk of death, injury, additional impairment. Various initiatives have been taken to deal with the group and make things accessible to them. Among them one of the initiatives is sensitization of communities about the needs of disabled people. Even in disaster risk reduction measures disability- inclusion is one of the important point. Some of the following measures are to be taken for person with disability in community preparedness.

Task	Activity
Identification	➢ Identification of person with disability in community with the kind of disability. ➢ Making the area of stay and work in the village.
Awareness and dissemination of	➢ Awareness programs related to disasters and vulnerabilities in their area.

Information	➢ Capacity building training with on rescue and emergency exits. ➢ Conducting mock drills including people with disability.
Monitoring	➢ Basic provisions for person with disability in Safe shelter with light, toilet, sanitation. ➢ Accessibility of the safe shelter through ramps for them. ➢ Ensuring safety evacuation doors for them.

5.21 Knowledge Management, networking and sharing

Knowledge management is all about getting right knowledge, in right place and at the right time. Preparedness is to develop, support and enhance the organizational knowledge process of knowledge creation, storage, retrieval, transfer and application. The management focuses on capturing, organizing and converting organizational knowledge into common database, for further effective retrieval of relevant contents through advanced searches from the data base. At the lower end organizations focuses on learning, sharing and collaborating through physical interactions, workshops, documentation of experiences or sharing through web portals. The networking comprises of all the SDMD, DDMD, and administrative training institutes.

Task	Activity	Responsibility
Knowledge Management	➢ Disaster management activities carried out at various levels. ➢ Documentation and dissemination of information to line departments. ➢ Training and awareness programs. ➢ Government, community and private organization resource mapping. ➢ Recording of best practices, lessons learnt, work experience and sharing with stakeholders in meetings, workshops and seminars.	➢ Revenue Department ➢ DDMA ➢ Technical Department

5.22 Uploading of information on resources on IDRN

IDRN is a web based common information system for managing the inventory of equipments, skilled human resources and critical supplies for emergency response. It manages the district

level resource database throughout the nation. The primary focus is to enable the decision makers to find answers on availability of equipments and human resources required to combat any emergency situation. This database also enables the organization to assess the level of preparedness for specific vulnerabilities. Total 266 technical items are listed in the resource inventory. The districts have been given the username and password through which they can perform data entry and data updation on IDRN for resources available in the district. The IDRN network has functionality of generating multiple query options based on specific equipment, skilled human resources and supplies with their location and contact details. Every year the resource inventory has been updated at the district level by DDMOs. Whereas NIC provide its technical assistance by updating it in website.

5.23 Media management/ Information dissemination

Mass media and communication system plays vital role in predicting and dissemination of information in advance. The communication system has significantly developed to a great extent in predicting and disseminating information about the disaster, there has been an impact on how public learns of and perceives the impact of disasters. Both the electronic and printing media has been linked to the disaster preparedness in awareness programs, warning dissemination, and evacuation, alerts government officials and in coordination with various stakeholders. Communication virtually links all the hazards mitigation process. The capabilities of communication, data gathering and data management technology have leaped forward in parallel with the increase knowledge about the origin and behaviour of natural hazards. The advancement in mass and telecommunication with technology had major contribution in forecasting and dissemination of information.

5.24 Medical preparedness and mass casualty management

For medical preparedness, the details of all the hospitals available in the district should be made available in the DDMA or Control room. In preparedness phase, the hospital authorities, management, doctors and other staffs should be trained in emergency management. Details of medical equipments and manpower available in each region should be made available and in case of emergency, the transportation of injured people should be made accordingly. During emergency, first aid for injured and triage in case of heavy causality is the duty of medical professional in the Taluka or district level. Based on the need for critical care facilities, Surgical Services, Transfusion Services etc victims should be allotted to different hospitals as per the available resources.

Chapter 6

6.1 Response

6.2 District Information Office

6.2.1 Actions on receipt of Early Warning

- To monitor the situation and direct the officers of all levels in the department, for high level preparedness to ensure the safety of buildings of the department and other assets.
- To appoint one nodal officer to coordinate with the emergency control room of the disaster management department and provide support and regular help to district magistrate and other subdivision officers.
- To give information to relevant offices and people about daily weather and also issuing a press bulletin.
- Support in dissemination of Early Warning information once approved by DDMA through the means of telecommunications, i.e. electronic messages to the society.
- Establish coordination with flood information center at the district level before the seasonal floods.
- The nodal officer for disaster management in the department shall be responsible for coordination with EOC, ESF nodal and support agencies and other departments. Appoint additional staff to support him as required for the situation.
- If EOC at district level declares it as an emergency situation and Unified Response is activated, disseminate the information to all staff, key stakeholders etc.
- Call for a coordination meeting of key officer to take stock of the situation, impact of disaster on department capacity, immediate actions for response like need and damage assessments, coordination with DDMA and Incident response system.
- Develop periodic situation report and share with EOC and DDMA.
- Organise initial assessment of damages and immediate, short term and long term needs as per the format enclosed and share it with EOC and other key stakeholders.
- In consultation with EOC/DDMA and support agencies, plan response actions as per immediate, short term and long term needs.

6.2.2 During emergency response

- Coordinate with respective disaster management committee for monitoring situation and ensure community participation in monitoring and surveillance activities.
- To disseminate the information and orders available from the DDMA.

- To be in coordination with district administration and provide the right information to media if any disaster or calamity occurs during the event. Also, to spread authorized information, collected from the concerned official department, among people through

  news, messages, SMS, Social Media and FM Channels. To make people aware of the truth.
- To frequently provide all the details regarding news being published by various newspapers and channels to the district administration. And, to publish official clarifications of the administration as per the necessity.
- DIO also ensures adequate directions to local cable channels and newspapers for not publishing any kind of news or information that can cause communal or religious discord among people.
- To give reliable information about the needs of the relief material in the areas and motivating the general public for their support. To ensure the damage and loss assessment of the department equipments and resource material, finances, etc. and recouped it as soon as possible.

6.3 Health Department

6.3.1 Activities on Receipt of Warning

- Appoint one person as "NODAL OFFICER" from the department to coordinate with DDMA and other local bodies.
- Review and update precautionary measures and procedures, and review with staff, the precautions that have been taken to protect equipment and the post disaster procedures to be followed.
- Stock emergency medical equipment which may be required after a disaster.
- Determine type of injuries/illnesses expected and drugs and other medical items required, and accordingly ensure that extra supplies of medical items be obtained quickly.
- Provide information to all hospital staff about the disasters, likely damages and effects, and information about ways to protect life, equipment and property.
- Equipment supplies such as candles, matches, lanterns and extra clothing should be provided for the comfort of the patients.
- Surgical packs should be assembled and sterilized. A large enough number should be sterilized to last four to five days. The sterilized surgical packs must be stored in

protective cabinets to ensure that they do not get wet. Covering the stock with polythene is recommended as an added safety measure.

- All valuable instruments, such as surgical tools, opthalmoscopes, portable sterilizers, CGS, dental equipments, etc., should be packed in protective coverings and store rooms considered to be the most damage-proof.
- Protect all immovable equipment, such as x-ray machines, by covering them with tarpaulins or polythene.
- Check the emergency electrical generator to ensure that it is operational and that a buffer stock of fuel exists. If an emergency generator is not available at the hospital, arrange for one.
- If surgery is to be performed following the disaster, arrange for emergency supplies of anaesthetic gases.
- Check stocks of equipments and drugs which are likely to be most needed after the disaster.These can be categorized generally as: Drug used in treatment of cuts and fractures, such as tetanus toxoid, analgesics and antibiotics. Drugs used for the treatment of diarrhoea, water- borne diseases and flu (including oral rehydrating supplies). Drugs required treating burns and fighting infections. Drugs needed for detoxification including breathing equipments.
- Assess the level of medical supplies in stock, including: Fissure materials, Surgical dressings, Splints, Plaster rolls, Disposable needles and syringes, local antiseptics, prepare an area of the hospital for receiving a large number of casualties.
- Develop emergency admission procedures (with adequate record keeping). Orient field staff with standards of services, procedures including tagging. Hospital administrators should establish work schedules to ensure that adequate staff is available for in-patient needs. Organize in-house emergency medical teams to ensure that adequate staff is available at all times to handle emergency casualties. Set up teams of doctors, nurses and dressers for visiting disaster sites.
- DMHO to prepare and circulate in vulnerable areas, a list of precautions to be taken by the public before, during and after the disaster to ensure that they maintain normal health under adverse conditions.
- Plan methods for quick transportation of seriously injured and sick person from disaster areas to specialties hospitals for effective treatment.
- After receiving the first flood warning, alert Dist. Medial Health Officer (DMHO) to plan and keep in readiness mobile hospitals, emergency field medical teams, Para

medical teams, surgery facilities, first aid kits etc. with sufficient equipment's and medicines at Dist. Hospitals and PHCs. They should be in a position to move to the affected areas at short notice.

- Plan for establishment of field medical centres, mobile clinics, emergency operation centres and trauma counselling centres at vulnerable areas on short notice.
- Plan for stocking sufficient quantities of blood of different groups at nearby Blood banks.Update the list of Govt. /private doctors and supporting staff whose services can be utilized during emergencies. Instruct them to be in readiness to move at short notice.
- Direct the officers of all levels in the department for high level preparedness and provide support and help to district magistrate, sub division officers, and other local bodies.
- Support in dissemination of Early Warning information once approved by DDMA and appoint a departmental person as a nodal person to coordinate with the EOC.
- Ensure that important contacts numbers, transport means, first aid box, essential drug kits, delivery kits and medical equipment and supplies, stretcher etc. are available in sufficient quantity.

6.3.2 During emergency response

- If EOC at district level declares it as an emergency situation and Unified Response is activated, disseminate the information to all staff, key stakeholders etc.
- DMHO will be in regular touch with District Collector and Control room to know the severity of situation and extend medical services accordingly in the affected areas. A medical control room at district and division levels shall be established with help lines.
- Call for a coordination meeting of key officer to take stock of the situation, impact of disaster on department capacity, immediate actions for response like need and damage assessments, coordination with ESF and Incident response system/EOC.
- Develop periodic situation report and share with EOC and DDMA.
- Organize initial assessment of damages and immediate, short term and long term needs as per the format enclosed and share it with EOC and other key stakeholder.
- Where ever necessary seriously injured and sick persons are shifted to Dist./State/Referral hospitals for specialist services. If roads are blocked, a method should be established to request helicopter transport.
- Provide first aid and medical assistance for injured and sick people. Special care should be taken for the aged and disabled people, children and pregnant women.

- DMHO will move maximum number of medical and Para medical teams, ambulances and mobile hospitals with adequate equipment's, medicines etc. to the affected area and provide medical assistance round the clock to the people. Each team should be allotted specific place in the disaster area and specified relief centres. DMHO should take all measures to ensure that replenishments are made continuously. DMHO will requisition the services of medical teams from unaffected Districts for use in disaster affected areas. DMHO will liaise with State for providing additional specialists teams and equipment's from State headquarters and other States.
- The provision of medical services should be coordinated by the CMO with district control room. Procedures should be clarified between Peripheral hospitals, Private hospitals, Blood banks, General hospitals and Health services established in transit camps, relief camps & affected villages.
- Maintain check posts and surveillance at Transport depots and all entry and exit points from the affected area, especially during the threat/ existence of an epidemic.
- An injury and disease monitoring system should be developed to ensure that a full picture of health risks is maintained.
- Monitoring should be carried out for epidemics, water and food quality and disposal of waste in transit and relief camps, feeding centers and affected villages.
- Plan for emergency accommodations for auxiliary staff from outside the area.
- Information formats and monitoring checklists should be used for programme monitoring and development and for reporting to Emergency Operation Center. This is in addition to the existing reporting system in the department.
- Seek security arrangements from district police authorities to keep curious persons from entering the hospital area and to protect staff from hostile actions.
- Establishment of a public information center with a means of communication to assist in providing an organized source of information. The hospital is responsible for keeping the community informed of its potential & limitations in disaster situations.
- Ensure to provide psychological first aid to people in acute distress and implement preventive, responsive and remedial measures to reduce the risk of sexual violence.

6.3.3 Post Disaster Activities

- Ensure that DMHO and other medical authorities at District and Block levels are in constant touch with Control rooms, know the latest situation and expand medical facilities

accordingly. Ensure continuation of educating people on precautions to be taken for maintaining hygiene and health in adverse conditions.

- DMHO to continue provision of medical facilities in the affected areas and relief camps till the people return to their places. Ensure adequate measures to continue for preventing break of epidemics by using disinfectants and chlorination.
- DMHO will obtain information on the medical relief provided in disaster areas, quantities of medicines used, the quality of services provide by medical and Paramedical staff, the adequacy of medical facilities available in vulnerable areas and forward to State for future action.
- Maintain a record of persons treated with full details and particulars for reference at a later date. Update and send plans for additional requirement of facilities, infrastructure to be created in vulnerable areas. Prepare a document on the event and send to State authorities for reference in future.
- Ensure continuation of educating people on precautions to be taken for maintaining hygiene and health in adverse conditions. DMHO to continue provision of medical facilities at the affected areas and relief camps till the people return to their places.
- Ensure adequate measures to continue for preventing break of epidemics by using disinfectants and chlorination. DMHO will obtain information on the medical relief provided at disaster areas, quantities of medicines used, the quality of services provide by medical and Para medical staff, the adequacy of medical facilities available at vulnerable areas and forward to State for future action.
- Vector borne like malaria, filarial, dengue, chikungunia, Japanese encephalitis, sprinkling of bleaching power and lime on the drains and roads to prevent gastro enteritis with the help of Sanitation team.
- During the natural calamities the immune states of the children will reduce naturally. Hence there is need of Post disasters immunization like Polio, Measles and Vitamin- A.

6.4 Animal Husbandary Department

6.4.1 Actions on receipt of early warning

- To immediately contact the District Control Room and will assist in the work.
- To ensure that the staff is on duty at the headquarters.
- To assign the work to be done to the subordinate officers and staff and send them to their sites.
- To receive instructions from the district liaison officer and do the needful.

- To ensure the availability of resources included in the DDMP and will make necessary arrangements to obtain those during emergency.
- To consult the Liaison Officer to prevent the probable epidemic among the cattle and also for the safety measures.
- To make groups having vehicles for emergency work and will assign the areas to them.
- To set up a temporary control room for the exchange of information for emergency work and will appoint a nodal officer.
- Ensure that flood warnings and precautions are properly received by the vulnerable communities and prepare them to face the disaster.
- Cattle rearing community at vulnerable places will be advised not to go for heavy animals, since shifting them during disaster period would be difficult. Move cattle, sheep, goats, pigs etc. to safer cattle yards from vulnerable areas and provide fodder and water.
- Ensure that boats and other equipment's of fishermen are moved to safer places and secured in association with fisheries department. Staff meant for emergency duties will be sent to their respective places of work and will be ready to undertake rescue and relief measures.
- Chalk out a strategy to deal with drought situation so as to ensure continuous supply of fodder and water to the animals.

6.4.2 During disaster response

- Blocks and Villages will arrange for shifting fishermen staying at low lying areas and near to dams to safer places and relief camps. Ensure that boats and other equipment's of fishermen are moved to safer places and secured.
- Arrange for providing medical help to distressed animals. Ensure sufficient quantities of medicines and vaccines are stored at places nearer to the vulnerable villages. Arrange for visits of veterinary doctors to affected villages.
- To maintain record keeping and maintenance of regular flow of information.
- Coordination with villagers to search and rescue trapped animals.

6.4.3 Post Disaster Activities

- Ensure that control rooms and flood-warning centres at Blocks will continue sending messages to the affected villages.
- Issuing death certificates against insured dead animals.
- Distribution of disinfectants where animals were buried.

- Provide sufficient food/fodder/water for animals kept at safe yards. Coordinate for veterinary help to distressed animals. Ensure supply of medicines and vaccines at places nearer to the vulnerable villages.
- Maintain record keeping.

6.5 Agricultural Department

6.5.1 Actions on receipt of early warning

- To appoint one nodal officer from the department to coordinate with the emergency control room of the disaster management and other local bodies.
- Ensure that regular feedback is provided by Blocks indicating seriousness of disaster, level of distress, position of standing crop and likely losses.
- Assign the work to his subordinate officers and staff the work to be done regarding agriculture under DDMP and send them to their sites.
- Receive instruction from the district liaison officer and take necessary action.
- Ensure the availability of resources included in the DDMP and will make due arrangement to get those during emergency.
- Make groups having vehicles for emergency work and will assign the areas to them.
- Set up a temporary Control Room for the dissemination of information for emergency work.
- Prepare initial damage assessment report and share it with DDMA.

6.5.2 During disaster response

- Coordinate with Blocks and Villages to get feedback on seriousness of disaster, level of distress, relief provided, steps taken for saving maximum standing crop, extent of flooded agricultural lands and estimated loss of crop.
- Move and position the staff meant for disaster management duties at their pre-decided places. They should move in villages and advise farmers on precautions to be taken for protecting the standing crop.
- The nodal officer should ensure that suitable instructions are issued to their field officers incluing their duties and function before, during and after disasters.
- Inspect the sub-ordinate offices, other centers and sub-centers under his control, which are damage prone.

6.5.3 Post Disaster Activities

- Village level team should visit the vulnerable cropped area and give suitable technical advices received from DAO.
- Ensure that adequate and timely relief/credit is made available to farmers for purchase of agricultural inputs through Govt. /private and easy loans through banks.
- Seeds, fertilizers and pesticides should be provided at subsidized rates. Ensure all relief measures, credit facilities and inputs are made available continuously to farmers till their next crop is harvested.
- Develop database village wise crop wise, irrigation, source wise, insurance details, credit facilities tec., with an objective of forecast of damages due to disasters.
- Fodder should be supplied in sufficient quantities at low prices.
- The enumeration team while enumerating the crop loss, should also record the names of the tenant farmers, along with the owners name. They should also record extent cultivated byte tenant farmer.

6.6 MSEDCL

6.6.1 Actions on receipt of early warning

- To monitor the situation and direct the officers of all levels in the department, for high level preparedness to ensure the safety of buildings of department and other assets.
- To appoint one nodal officer from the department to coordinate with the emergency control room of the disaster management department and provide support and regular help to district magistrate and other sub division officers.
- Support in dissemination of Early Warning information once approved by DDMA through the means of telecommunications i.e. electronic messages to the society.
- Establish coordination with flood information centre at the district level before the seasonal floods.
- To ensure that trees and branches have been cleared which have fallen on electrical lines.
- If EOC at district level declares it as an emergency situation and response is activated, disseminate the information to all staff, key stakeholders etc.
- Call for a coordination meeting of key officer to take stock of the situation, impact of disaster on department capacity, immediate actions for response like coordination with ESF and Incident response system /EOC/DDMA.

- To give wide publicity that household should arrange lanterns and battery light for use in case of power cut-off during emergency times. Develop periodic situation report and share with EOC and DDMA.
- Assist the state authorities to make arrangements for standby generators in the following public service offices from the time of receipt of alert warning-

    1. Hospitals
    2. Water Supply Stations
    3. Collectorate
    4. Police stations
    5. Telecommunications buildings

- Fill departmental vehicles with fuel and park them in a protected area.
- Check emergency tool kits, assembling any additional equipment needed.
- Immediately undertake inspection from the time of receipt of-

    1. High tension wires
    2. Towers
    3. Substations
    4. Transformers
    5. Insulators
    6. Poles and
    7. Other equipments

- Organise initial assessment for damages and immediate, short term and long term needs as per the format enclosed and share it with EOC and other key stakeholders.
- In consultation with EOC/DDMA and support agencies, plan response actions as per immediate, short term and long term needs.

6.6.2 During disaster response

- Restoration of power lines on priority to hospitals, water supply, control room, railway station and other life line structures.
- Presence of engineers in the affected area.
- Live wires on the ground should be removed immediately.
- Damaged electrical poles should be immediately replaced/ repaired and if fallen on road should be removed.
- Support with search and rescue, relief programs etc. by connecting with nodal agencies for different essential support functions.

6.7 Public Works Department

6.7.1 Actions on receipt of early warning

- Establish communication with DDMA, District Magistrate and other local administration.
- To instruct all officials to keep manpower and materials prepared for protection and repair of public works.
- Dispatch extra vehicles to be stationed at strategic posts along routes likely to be affected.
- Move heavy equipments such as front end loaders, to areas likely to be damaged.
- Inspect all roads, road bridges by a bridge engineer, including underwater inspection of foundation and piers. A full check should be made on all concrete and steel works.
- Secure works under construction ropes, sandbags and cover with tarpaulins if necessary.
- If people are evacuating the area, the evacuation routes should be checked and assisted.
- Establish a priority listing of roads which will be opened first, the most important being roads to hospitals and main trunk routes. Give priority attention to urgent repair works in disaster affected areas.
- Identify locations for setting up transit and relief camps, feeding centers and quantity of construction materials required and informs the DCR accordingly.
- Emergency tool kits must be made available and should include
    1. Crosscut saws
    2. Axes
    3. Power chain saw
    4. Sharpening Files
    5. Chains and tightening wrenches
    6. Pulley block with chain and rope

6.7.2 During disaster response

- All works teams should be issued two-way communication link. Provide a work team carrying emergency tool kits, depending on the nature of the disaster, essential equipments such as Towing vehicles, Earth moving equipments, Cranes etc.
- Adequate road signs should be installed to guide and assist the drivers.
- Begin clearing roads. Assemble casual laborers to work with experienced staff and divide into work gangs.
- Mobilize community assistance for road clearing by contacting community organizations.Undertake repair of all paved and unpaved road surfaces including edge metal ling, pothole patching and any failure of surface, foundations in the affected areas and keep monitoring their conditions.

- Undertake construction of temporary roads to serve as access to temporary transit and relief camps, and medical facilities for disaster victims.
- Undertake clearing of ditches, grass cutting, burning, removal of debris and the cutting of dangerous trees along the roadside in the affected area through maintenance engineer's staff.
- Undertake repair of all paved and unpaved road surfaces including edge metalling, potholes patching and any failure of surface, foundations in the affected areas by maintenance engineer's staff and keep monitoring their conditions.
- Undertake construction of temporary roads to serve as access to temporary transit and relief camps and medical facilities for disaster victims.
- As per the decision of the district control room, undertake construction of relief camps, feeding centres, medical facilities, cattle camps.
- An up-to-date report of all damages and repairs should be kept in the district office report book and communicate the same to the district control room.
- If possible, review of the extent of damage (by helicopter) should be arranged for the field Officer-in-Charge, in order to dispatch most efficiently road clearing crews, and determine the equipments needed. As per the decisions of the State/District Emergency Operations Center. Undertake construction of temporary structures required, for organizing relief work and construction of relief camps, feeding centers, medical facilities, cattle camps and SOC/s.
- Provide assistance to damage assessment team for survey of damage to buildings and infrastructure.
- Zonation of affected areas and estimate the total loss to buildings.

6.7.3 Post Disaster Activities

- To analyse the damage assessment and ensure the departmental resources like equipments, construction material,building resource material, finances etc. used for disaster response purpose are accounted and recouped as soon as possible.

6.8 BSNL

Vulnerable and critical network components

- According to hazard profile of the area, TSPs will identify vulnerability of their respective telecom infrastructure and accordingly prepare plan for emergency situations. All the vulnerable critical network components should have sufficient redundancy including transmission links and power backups in terms of battery storage capacity and diesel / fuel availability.
- Low power consumption equipment should be preferred at all vulnerable / critical locations.

6.8.1 Actions on receipt of Early Warning

- To monitor the situation and direct the officers of all levels in the department, for high level preparedness to ensure the safety of buildings of department and other assets.
- To appoint one nodal officer from the department to coordinate with the emergency control room of the disaster management department and provide support and regular help to district magistrate and other sub division officers.
- Support in dissemination of Early Warning information once approved by DDMA through the means of telecommunications, i.e. electronic messages to the society.
- Establish coordination with flood information center at the district level before the seasonal floods.
- If EOC at district level declares it as an emergency situation and Unified Response is activated, disseminate the information to all staff, key stakeholders etc.
- Call for a coordination meeting of key officer to take stock of the situation, impact of disaster on department capacity, immediate actions for response like need and damage assessments, coordination with ESF and Incident response system/EOC.
- Develop periodic situation report and share with EOC and DDMA.
- Organise initial assessment of damages and immediate, short term and long term needs as per the format enclosed and share it with EOC and other key stakeholders.
- In consultation with DDMA/EOC and ESF nodal and support agencies, plan response actions as per immediate, short term and long term needs.

6.8.2 During disaster response

- Coordinate with the respective disaster management committee for monitoring situation and ensure community participation in monitoring and surveillance activities.
- Provide setup for the web-conferencing or audio conferencing for the district administration.

- Immediately restore the communication system in the affected area.
- Ensuring that the affected communities are able to contact their relatives in distant places.
- To conduct the damage and loss assessment like equipments and resource material, finances, etc. and recover and recouped its after disaster.
- Keep a vigil also on the areas not affected by the disaster.

6.8.3 Post Disaster Activities

- Check if all the necessary life saving measures is in place and there is no further risk to life property and environment due to infrastructure of BSNL. Give status report to EOC/ DDMA.
- Ensure that the maintenance of communication system etc. has been owned by private companies, community level committees and adequate monitoring mechanisms are in place.
- To conduct the damage and loss assessment and submit the report to DDMA.

6.9 Forest Department

6.9.1 Actions on receipt of Early Warning

- To immediately contact the district control room and will assist in the work.
- To ensure that the staff at the headquarter is on duty.
- To assign the work to be done by the subordinate officers and staff regarding transportation under DDMP and to send them to their sites.
- To arrange for wireless, telephones, manpower, forest guard in advance to disseminate information of the disaster in the damage prone areas and will play a key role with the district administration to warn the public.
- To make advance arrangement for fuel wood and bamboos, gravels for priority areas.

6.9.2 During Disaster Response

- To follow the instructions of District Disaster Management Authority.
- To carry out the duty assigned for search and rescue work.
- To engage the resources and manpower available to manage the disaster.
- To prepare a primary report of damage for the affected areas.
- To take actions to provide electricity, water and sanitation to the temporary shelters in the forest areas.

- To send task forces with vehicles, tree cutters, ropes, flood light, generator in case of closure of roads due to felling of trees.
- Open the forest land for free grazing when flood waters enter villages, and there is not enough fodder available.
- Allow the transportation of fodder from forest areas, when the fodder is not freely available.
- Provide wooden poles and bamboo for relief and reconstruction at subsidized rate. Provide these materials to all the technical departments, which need them.

6.10 Incident Response System

6.10.1 Introduction

The emergency response plan is a first attempt to fllow a multi hazard approach to bring out all the disasters on a single platform and incorporates the *'culture of quick response'*. Under the plan, common elements responsible for quick response have been identified and a set of responsible activities has been articulated. It provides a framework to the primary and secondary agencies and departments, which can outline their own activities for disaster response. The plan will also include specific disaster action plans along with modal scenarios in detail to conduct practice drills at district administrationlevel.

6.10.2 Operational Direction and Coordination

6.10.3 Various Response Levels

Most of the disasters are to be managed at the state and district level. The Centre plays a supporting role in providing resources and assistance. It will mobilize support in terms of various emergency teams, support personnel, specialized equipments and operating facilities depending upon the scale of the disaster. Active assistance would be provided only after the declaration of national emergency level.

Incase disaster may be managed at the district level, district emergency operation system would be activated where state and national level authorities would be on guard in case of assistance needed. Incident commander (IC) of the district would activate the emergency support functions and Incident Response System and similarly according to the guidance disaster management teams and quick response teams wouldrespond.

If disaster may not be managed with district level and required active participation of state resources, State EOC would activate and Divisional Commissioner would take over the IC system.

6.10.4 Operational –Coordination Structure

Each organization generally has a framework for direction of its operation and coordination between its different units. Disaster Management generally requires partnership between organizations and stakeholders. An effective and early response requires mobilization of manpower, equipments and materials belonging to different organizations which may not be working together during normal times. Therefore a framework needs to be prescribed as a part of emergency planning for operational directions and coordination during response phase. This plan recognizes role of Deputy Commissioner in providing overall operational direction and coordination for all the response functions. With the help of District Disaster Management Committee (DDMC) and District Emergency Operation Centre,Deputy Commissioner will formulate following coordination structure for responseplan.

6.10.5 Trigger Mechanism

As soon as Emergency Operation centre would get the information about any emergency, the staff on duty in EOC will pass the information the DC and seek for his instruction for further actions. If the information pertains to the occurrence of a disaster in any part of the district, the staff on duty will also try to inform DDMA members, Emergency Support Functions-team leaders, major hospitals and State Disaster Management Authority etc. The staff on duty will also be responsible to reclaim information related to type, magnitude and location of the disaster and also inform it to responsible authorities. The EOC in-charge will also inform all the details to Divisional Commissioner and State EOC. All the desk officers/team leaders and Incident Response Team members will also be informed to immediately report at District EOC. Incident Response team and Desk officials would respond as per their standard operating procedures and directions of Incident Commander (IC).

6.10.6 Activation of Incident Response System

The emphasis in Disaster Management has shifted from relief centric approach to proactive regime, and as such a well-coordinated response with clockwork precision becomes one of the most important goals. Incident Response System has been developed in this regard.

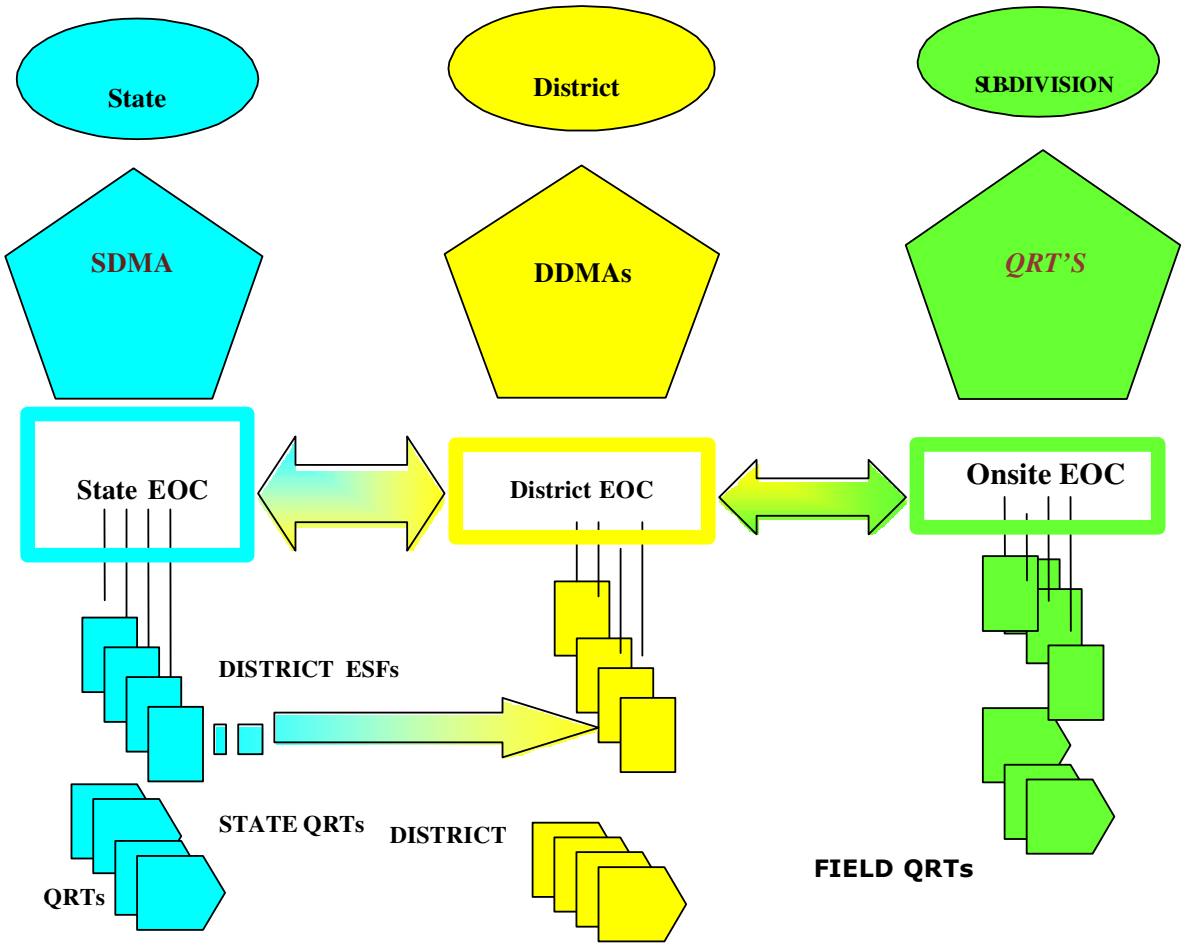


Figure 6.1: Various Response Levels for Disaster Management

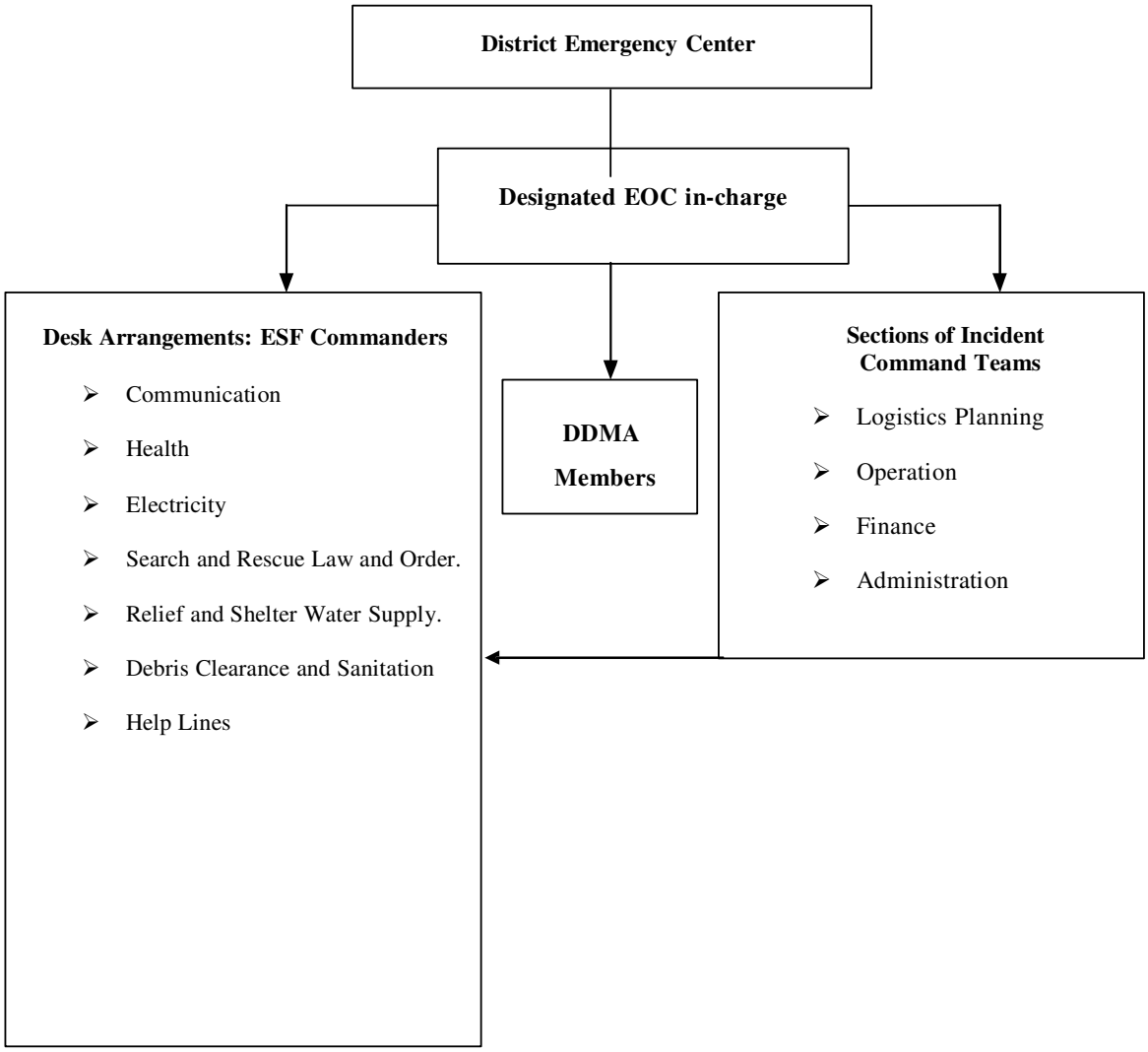


Figure 6.2: Trigger mechanism for District EOC

6.11 Incidence Response System

During emergency period DC would be designated as Incident Commandant and shall take up following immediate actions.

1) IC will designate IRS members according to the rank requirement and assign responsibilities under four sections of logistics, planning, finance and administration.
2) IC will also direct to the EOC in-charge (District Disaster Management Officer)to inform all the DDMA members about the incident and ICP(Incident Commandant Post).
3) IC will direct ADM to coordinate with the team leader of Emergency Support Functions(ESFs).
4) EOC/PCR will also pass the information to the DDMA members about the location of ICP.
5) Direct EOC in-charge to pass the information to the State apex body/Unified commander.

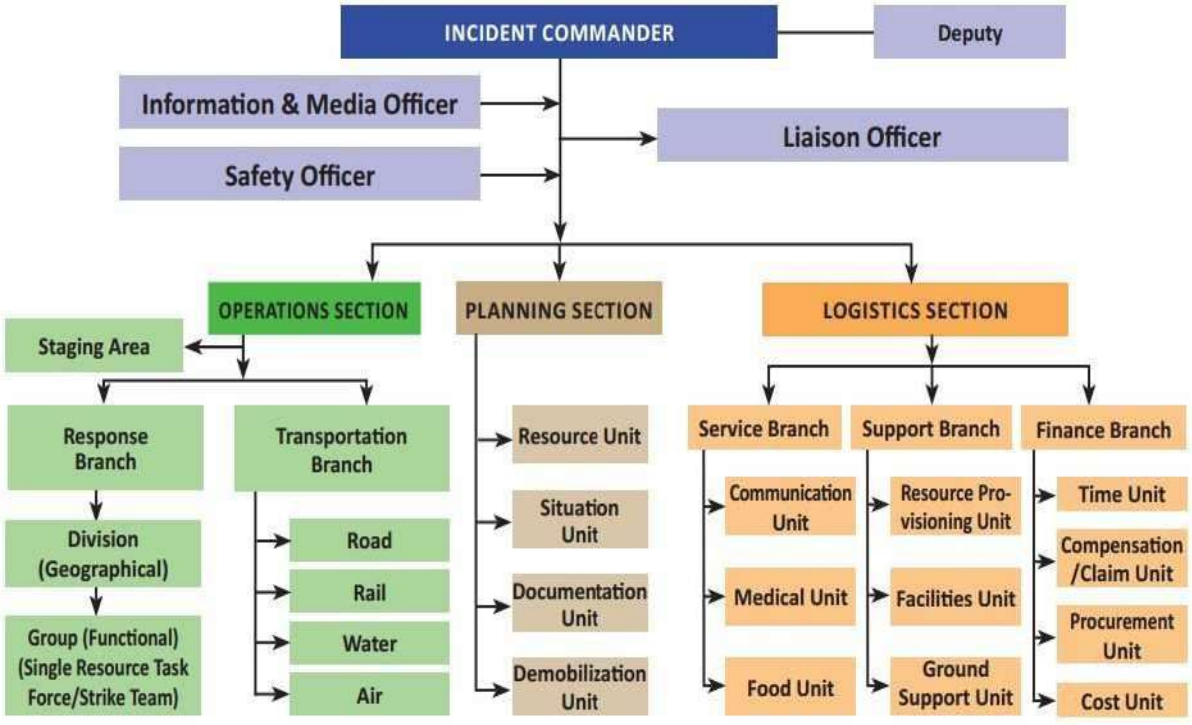


Figure 6.3: Structure of Incident Response Team

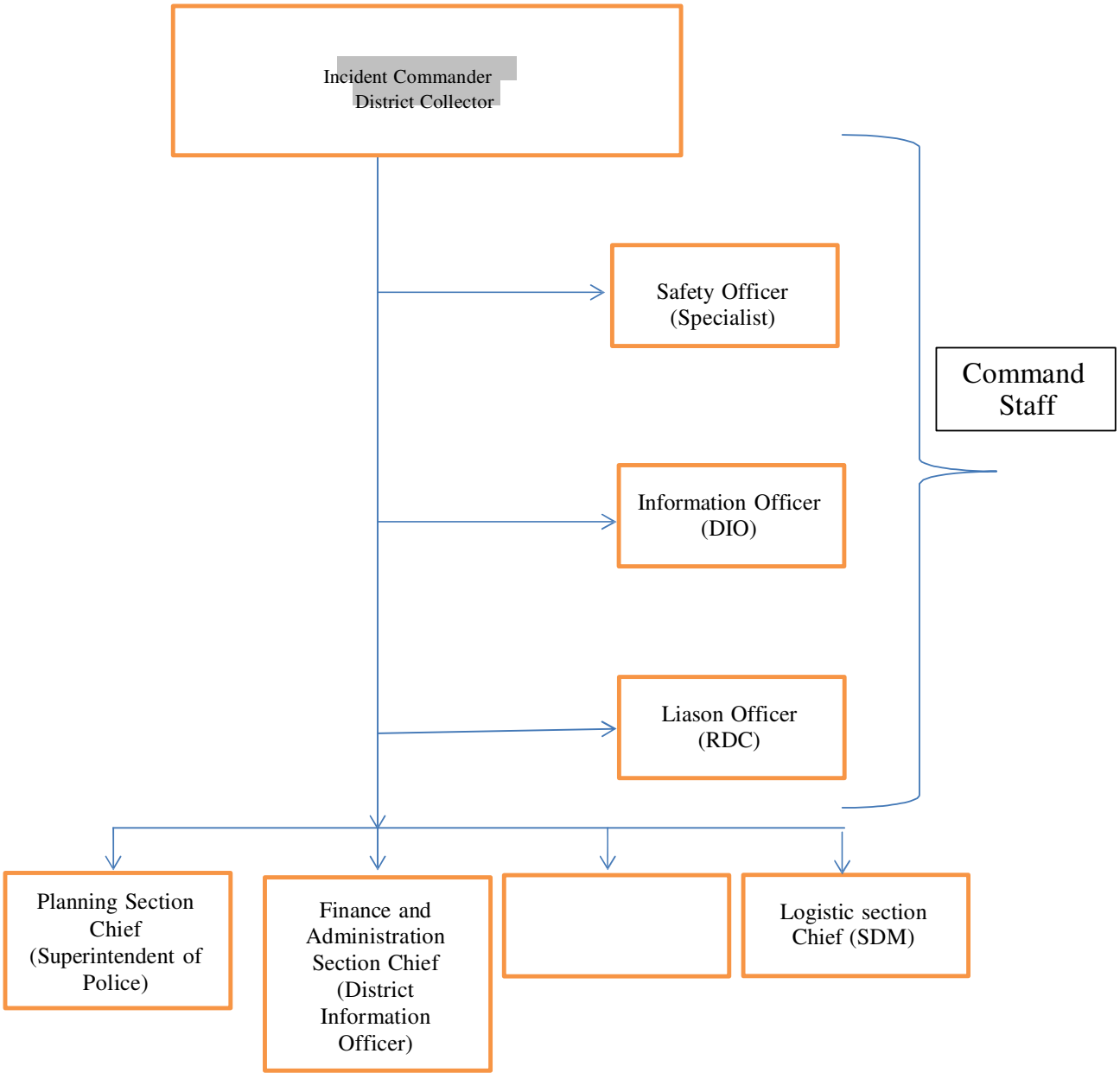

Incident Commander
District Collector
Safety Officer
(Specialist)
Information Officer
(DIO)
Liason Officer
(RDC)
Command
Staff
Planning Section
Chief
(Superintendent of
Police)
Finance and
Administration
Section Chief
(District
Information
Officer)
Logistic section
Chief (SDM)

Table 6.1 : Rank for District level Incident Response Team

S.N	IRS Position	Suggested rank and position for District
1.	**Responsible Officer**	District Collector
2.	**Incident Commander**	District Collector
3.	Liaison Officer	Resident District Collector Officer
4.	Information and Media Officer	District Information Officer
5.	Safety Officer	Specialist from DDMA/NDMA
6.	**Operations Section Chief**	Additional District Collector
7.	Staging Area Manager	Area Tehsildar
8.	Response Branch Director	Divisional Fire Officer
9.	Transportation Branch Director	Motor Licensing Officer
10.	**Planning Section Chief**	Superintendent of Police
11.	Situation Unit Leader	Respective Tehsildar
12.	Resource Unit Leader	Area Tehsildar
13.	Documentation Unit Leader	DPO
14.	Demobilization Unit Leader	Area Tehsildar
15.	Technical Specialist	Specialist from NDMA/DDMA
16.	**Logistic Section Chief**	Area SDM
17.	Service Branch Director	SDM(Election)
18.	Support Branch Director	Tehsildar 1
19.	Communication Unit Leader	SDM (Election)
20.	Food Unit Leader	Tehsildar 1
21.	Facilities Unit Leader	Tehsildar 2
22.	Ground Support Unit Leader	Tehsildar 2
23.	Medical Unit Leader	District medical officer(DMO)
24.	Finance Branch Director	Account Officer
25.	Time Unit Leader	SDM(Election)
26.	Cost Unit Leader	Accounts Officer, O/o-Dy. Commissioner

6.12 Responsibilities under Incident Response System

6.12.1 Incident Commander

- Incident Commander (IC) shall rush to the Emergency Operation Center (EOC) where technical experts and section chiefs shall join him. He shall remain in the contact of EOC to know the updated status ofincident.
- In consultation to technical experts Incident Command Post (ICP) shall be selected near incident site. Site selection shall be on the basis of the wind prevailing directions and probability of secondary hazardsetc.
- Obtain updates of the incident situation from ICP and establish a link for continuous communication through dedicated telephone lines with speaker phones, set of walkie-talkies, computer link etc. with the help of coordinator
- Supervise the overall management of each function through respective members of DDMA and expediting response whenever required.
- Identify the hazardous and threatened areas based on map and information received ICP.
- Take a decisions on requirement and priorities of evacuation and organize the resources to execute the same.
- Based on the inputs from the first responders, and experts available at ICP, identify the additional resources requirement and initiate mobilization with the help of section chiefs. Coordinate with the other district authorities and state authority.
- After making required arrangement, IC shall visit incident site to supervise the situation.
- He shall also take decisions in demobilizing the resources after the incident.

Following three officers will support Incident Commander along with Operation, logistic, planning and finance section chiefs.

6.12.2 Safety Officer

1. Recommend measures for assuring safety of responders and to assess or anticipate hazardous and unsafe situations and review itregularly;
2. Ask for assistants and assign responsibilities asrequired;
3. Participate in planning meetings for preparation of IAP (Incident ActionPlan);
4. Review the IAP for safetyimplications;
5. Obtain details of accidents that have occurred within the incident area if required or as directed by IC and inform the appropriate authorities;
6. Review and approve the Site Safety Plan, as and when required;

6.12.3 Liaison Officer

1. Maintain a list of concerned line departments, agencies (CBOs, NGOs) and their representatives at various locations.
2. Carry liaison with all concerned agencies including NDRF and Armed forces and line department of Government.
3. Monitor Operations to identify current and potential inter-agencyproblems.
4. Participate in planning meetings and provide information on response by participatingagencies.
5. Ask for personnel support ifrequired.
6. Keep IC informed about arrival of all Government and Non – government agencies and their resources.
7. Help in organizing briefing sessions of all Government and Non-governmental agencies with IC.

6.12.4 Information Officer

1. Prepare and release information about the incident to the media agencies and others with the approval of IC.
2. Jot down decision taken and directions issued in case of sudden disasters when Incident Response Team has not been fully activated.
3. Ask for additional personal support depending on the scale of incident and workload.
4. Monitor and review various media reports regarding the incident that may be useful for incident planning.
5. Organize Incident Action Plan meeting as directed by the Incident Commander.
6. Coordinate with IMD to collect weather information and disseminate it to allconcerned.

6.12.5 Operation Chief: Additional District Collector

Most preferred rank for the operation chief is Additional District Collector. Following are the duties designated for Operation Chief:

- Responsible for the management of all operations directly applicable to the primary mission. He will activate the emergency support functions and will coordinate with the team leaders of ESFs.
- Activates and supervises organization elements in accordance with the Incident Action Plan (IAP) and directs itsexecution.
- Determine need and request additionalresources.

- Review suggested list of resources to be rebased and initiate recommendation for releaseofresources.
- Make expedient changes to IAP asnecessary.
- Report Information about special activities, events or occurrences toIncident Commander.
- Maintain Unit / Activity details.

6.12.6 Emergency Support Functios

ESFs shall be activated under Operation Chief. On the receipt of information Team Leaders (TLs) would take up following actions.

a. On the receipt of information about the off-site emergency Team Leaders (TLs) will activate their own Emergency Support Functions(ESFs).
b. TLs will join IC and Operation Chief (ADM) in EOC to ensure coordination and to provide assistance.
c. TLs would also move to the site for better operational control.
d. TLs will call the nodal officers of supporting agencies and immediately deploy the quick response teams (QRTs) from the location of nearest to the incident site.
e. They further reinforce their teams by deploying additional resources from surrounding areas so the effective first respond can be rendered at site.
f. A high alert would be notified to move additional resources and manpower to the incident site.
g. According to the feedback report additional TLs will take decision of movement of more team and manpower. In some of cases TLs may need to mobilize resources from nearby districts or states. In such cases chiefs will organize this through respective headquarters.

6.12.7 Planning Section Chief

Planning section chief shall be responsible for performing following duties:

- Collection, evaluation, dissemination and use of information about the development of incident and status of resources. Information is required to understand the current situation and to prepare alternative strategies and control operations.
- Supervise preparation of Incident Action Plan (IAP).
- Provide input to Incident Commander and Operation Chief in preparation of IAP.
- Reassign out of service personnel already on site to other positions as appropriate.
- Determine need for any specialized resources in support of the incident.
- Establish information requirements and reporting schedules for Planning Section Unit (e.g.Resources, SituationUnit).
- Compile and display incident status information.
- Facilitate the preparation and implementation of Incident DemobilizationPlan.

- Incorporate Plans (e.g. Traffic, Medical, Site Safety, and Communication) into IAP.
- Maintain Unit / Activity details.

✓ **Resource Unit Leader**

Responsible for maintaining the status of assigned resources (Primary and support) at an incident. This is achieved by overseeing the check-in of all resources, maintaining a status keeping system indicating current location and status of all resources and maintenance of a master list of all resources e.g. by key supervisory personnel, primary land support resources etc.

- Establish check-in function at incident locations.
- Prepare Organization Assignment List & Organizationchart.
- Maintain & post the current status and location of all resources.
- Maintain master list of all resources checked in at the incident.

✓ **Check-in/Status Recorder:**

Needed at each check-in location to ensure that all resources assigned to an incident are accounted for:

- Prepare check-in form, resource status boards and status displayboard.
- Establish communications with the communication Centre and Ground Support unit.
- Post signs so that arriving resources can easily find the check inlocations.
- Record check-in information on check-inlists.
- Transmit check-in information to Resources Unit on regular pre-arranged schedule/ as per need.
- Receive, record and maintain status information for single resources, strike teams, task forces, overhead personnel.
- Maintain file of check-inlists.

✓ **Situation Unit Leader**

- Begin collection and analysis of incident data as soon aspossible.
- Prepare post or disseminate resource and situation status information as required, including specialrequests.
- Prepare incident status summary.
- Provide photographic services and maps ifrequired.

✓ **Display Processor** ***(Draftsman-Computer trained):*** Responsible for display of incident status information obtained for field observers, resource status reports, aerial photographs,etc.

- Determine:-

1. Location of work assignment.
2. Numbers, types and locations of displays required.

3. Priorities.
4. Map requirements for incident.
5. Time limits for completion.
6. Field observer assignments & communication means.

- Obtain necessary equipment and supplies.
- Obtain copy of IAP for each period.
- Assist SITL in analyzing and evaluating field report.
- Develop required displays in accordance with time limits forcompletion.

✓ **Field Observers**

Responsible to collect situation information from personal observations at the incident & give it to situation team leader.

- Determine:-
  1. Location of assignment.
  2. Type of information required.
  3. Priorities.
  4. Time limit for completion.
  5. Method of communication.
  6. Method of transportation.
- Obtain copy of IAP for the operation period
- Obtain necessary equipment & supplies for hisuse.
- Collect datalike.
- Perimeter of location of hot spotsetc.
- Be prepared to identify all facilities location (e.g. divisionboundaries).
- Report information to SITL.

✓ **Demobilization Leader**

- Responsible for developing incident DMOB Plan.
- Review incident resource records to determine the likely size and extent of DMOB effort addl. Personnel, work space and supplies needed.
- Coordination DMOB with agency representatives.
- Monitor ongoing operation section resource needs.
- Identify surplus resources and probable releasetime.
- Develop incident check out for all units.

✓ **Documentation Leader:** District Planning Leader and Tahsildar

- Arranging for complete documentation of proceedings at the incident site.
- Maintaining record of what happened and what actions were taken…

i) Recovering response costs and damages.

ii) Setting the record straight where there are charges of negligence or mismanagement resulting from the incident.

iii) Reviewing the efficiency and effectiveness of responseactions.

iv) Preparing for future incident response.

v) Videotaping of the entire combat the rescue operations.

✓ **Technical Coordinators**

Two to Four experts in geo-sciences, fire safety, flood rescue, industrial safety and health shall be nominated as technical experts. Major issues shall be addressed by them are:

- Formulation of response objectives and strategy

TC shall assess the incident before taking actions and formulate realistic response objectives. The assessment shall be based upon following points:

- Pre-incident plans
- Information related to material involved, container involved, vehicle and structure involved and atmospheric conditions affecting the incident.
- Environmental monitoring and sampling data (if available)
- Public protective actions to be initiated.
- Resource requirements (trained manpower, specialized protective gear and other equipments)
- Hazards posed to the near by areas.

On the bases of above-mentioned points they will formulate a defensive strategy to protect the public and environment from the immediate spill or discharge area.

6.12.8 Identification of Hazard Zone

Technical experts shall be able to determine real time contaminant concentrations at various distances downwind. They shall be responsible to estimate downwind concentrations and feeding the information to the Team leaders of various ESFs for further response. To estimate the hazard zone in a particular emergency scenario, the technical coordinator shall place the transparency of the vulnerability template with its x-axis along the prevalent wind direction and start point on the source of release on the scaled map.

- **Establishment of Hazard Control Zones at Incident Site**

Technical expert should determine the zones varying according to the severity of hazard. For example Hot Zone, Warm Zone and Cold Zone. According to the zones local commandant post and rescue operations should take place.

- **Suppression of Hazardous Gas or Vapour Releases**

Technical experts should also identify response measures to any other probability of outburst due hazardous gas and vapour release directly in the atmosphere from the ruptured and punctured containers or from the evaporating and boiling pools of liquid that have been formed due to chemical spill.

- **Selection of Personal Protective Equipments (PPEs)**

Technical persons should be able to guide the QRTs entering the hot zone on the correct type of PPEs as it is necessary to ensure that the materials from which clothing is fabricated will not be penetrating by the spill substance.

6.12.9 Logistic Section Chief

Responsible to provide facilities, services and materials for effective management of disaster. Participates in development and implementation of Incident Action Plan (IAP) and activates & supervise Logistic section

- Assign work locations & tasks to section personnel.
- Participate in preparation of IAP.
- Identify service and support requirements for planned and expected operations.
- Coordinate and process requests for additional resources.

- Provide input to review communication plan, Traffic plan, medical plan etc.
- Prepare service and support elements of IAP.
- Recommend release of unit resources as per DDMP.
- Maintain Unit/ Activitydetails.

Following are the team members who will assist him in the process under service and support branch.

6.12.10 Communication Unit Leader:

- Prepare & implement incident wireless communication plan.
- Ensure that incident communication centre & Message centre are established.
- Establish appropriate communication distribution/maintenance locations within base/camps.
- Ensure communication systems are installed and tested.
- Ensure equipment accountability system is established.
- Ensure personal portable wireless sets from cache is distributed as for incident wireless communication plan.
- Provide technical information required on:

a. Adequacy of communication system currently in operation.
b. Geographic limitation on communication system.
c. Equipment capabilities/limitations.
d. Number and types of equipments available.
e. Anticipated problems in the use of communication equipments.
f. Ensure equipments are tested and repaired.
g. Recover equipments from released units.
h. Responsible to receive and transmit wireless and telephone messages among to between personnel to provide dispatch services at the incident.
i. Set up message centre location as required.
j. Receive and transmit messages within and external to incident.
k. Maintain files of general messages.
l. Maintain a record of unusual incident occurrences.

6.12.11 Medical Unit Leader:

Responsible for

- Development of medical response plan.
- Respond to requests for medical side and transportation for injured & ill incident personnel medical supplies.

6.12.12 Supply Unit Leader:

Primarily responsible for ordering personnel, equipment & supplies receiving and storing all supplies for the incident maintaining an inventory of supplies servicing non-expendable supplies to equipment.

- Determine the type & amount of supplies enroute.
- Order, receive, distribute and store supplies & equipment.
- Receive and respond to requests for personnel, supplies and equipment.
- Maintain inventory of supplies &equipment.
- Service reusable equipment.

6.12.13 Ordering Manager:

- Obtain necessary order forms.
- Establish ordering procedure.
- Establish name and telephone number of personnel receiving orders.
- Get names of incident personnel who leave ordering authority.
- Check on what has been already ordered.

- Orders when possible.
- Place orders in a timely manner.
- Keep time and location for delivery of supplies.
- Keep receiving and distribution manager informed of order splaced.

6.12.14 Receiving & Distribution Manager:

- Organize physical layout of supply area.
- Establish procedures for operating supply area.
- Set up a system for receiving and distribution of supplies and equipment.
- Develop security requirement of supply area.

6.12.15 Facilities Unit Leader:

- Primarily responsible for the layout and activation of incident facilities e.g. base, camps, ICP.
- Provides rest and sanitation facilities for incident personnel.
- Manage base and camp operations (to provide security and general maintenance)

6.12.16 Ground Support Unit Leader:

- Support out of service resources.
- Transportation of personnel, supplies, food & equipment.
- Fueling, service, maintenance and repair of vehicles and other ground support equipment.
- Implementing traffic plan for the incident.

6.12.17 Food Unit Leader:

Responsible for supply needs for the entire incident including camps, staging areas.

- Determine food & water requirements.
- Determine method of feeding to best fit each facility or situation.
- Obtain necessary equipment & supplies and establish working facilities.
- Order sufficient food & potable water from the supply unit
- Maintain an inventory of food,water
- Maintain food service areas & ensure that all appropriate health & safety measures are being followed.

6.12.18 Finance and Administration Section Chief

Responsible to take decisions related to financial and cost related matters under given time frame. Following positions would be helping him in conducting his duties:

(a) Time Unit Leader: Responsible for status recording and equipment's time taken recording.

(b) Procurement Leader: Responsible for administering all financial matters pertaining to vendor contracts.

(c) Cost Unit Leader: Responsible for collecting all cost data, performing cost effectiveness analysis & providing cost estimates & cost saving recommendations for the incident.

6.12.19 Desk Arrangements

District EOC will expand to include desk arrangements with responsibilities for specific tasks. The desk arrangement may continue to operate from EOC till the time long term plan for rehabilitation are finalized. The desk arrangements provide for divisions of tasks, information gathering and record keeping and accountability of the desk officer to the district commissioner. The Team leaders of emergency support functions shall be the desk officer and work under the coordination of Operation Chief. The desk officers shall be responsible to prepare, update and process reports according to the formats. Below given are emergency support functions of each desk officer/team leader.

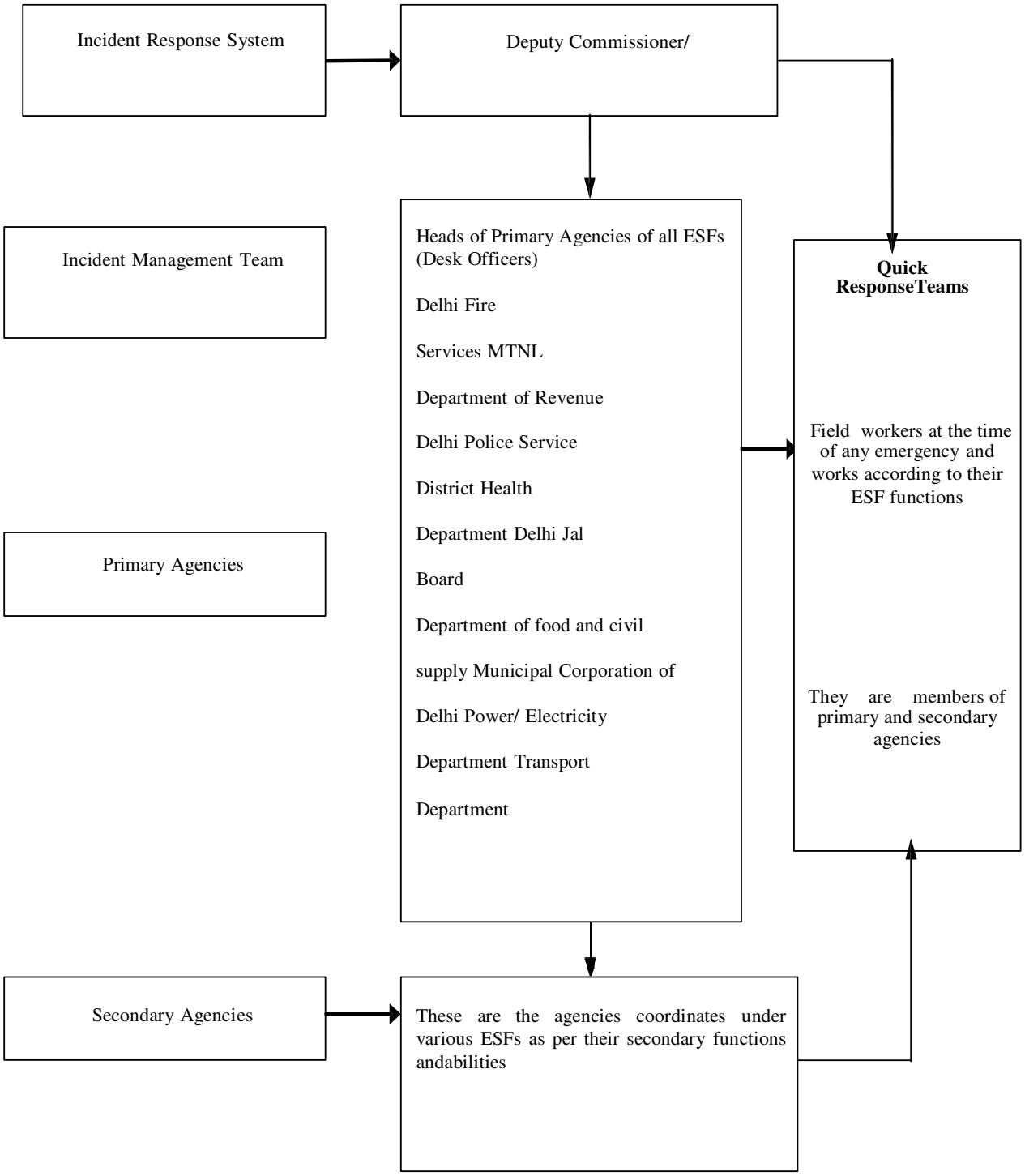


Figure 6.4: Emergency Response Functions in Response Mechanism

6.13 Emergency Support Functions

Emergency Support Functions (ESFs) are the essentials of Emergency Management comprising of various coordinating agencies, which manage and coordinate specific kinds of assistance common to all disasters types. The plan establishes an organised set-up to conduct ESF operations for any of the Natural and Manmade Disasters. It outlines an implementing framework of sharing resources and co-coordinating, preparedness, mitigation, response and recovery as per the requirement. The Plan has structured the activities of concerned agencies i.e. primary/nodal and support agencies into an organised manner according to their capabilities, skills, resources and authorities across the state and district government. It also attempts to unify efforts of state departments so that they are involved in emergency management comprehensively to reduce the effects of any emergency or disaster within the state. Refer table 6.2 for the list of ESFs and primary and secondary agencies involved.

6.14 Organization Setup of the ESF at District Level

The Revenue Department of the district, which may be renamed as Department of Revenue and Disaster Management, as directed by the Ministry of Home Affairs, is the prime co-ordinating agency for disaster risk management efforts. However there will be other agencies involved in-charge of different ESFs. Each ESF is headed by a lead organization and assisted by supporting organizations for coordinating the delivery of resources and services to the disaster-affected area. These ESFs form an integral part of the EOC and each ESF should coordinate its activities form the allocated EOC. Extension teams and quick response teams (QRTs) would be required to follow their response procedures at the affected site. Nodal officers of all the ESFs would constitute Incident Management Team. Nodal officer would also nominate names for the QRT members who will accomplish disaster management related work at the field level. Similarly supporting agencies would also nominate their nodal officers and QRT members who will assist to the primary officers during response phase. Additional names should also be proposed to backstop the requisite positions.

Nodal and Supporting agencies comprising of QRTs shall be trained to carry out their functions at the response site. The success of ESF will be of critical importance and would reflect in the lives saved in the golden hour. All ESFs have to assist the Incident Commander i.e. Deputy Commissioner at State level as per their assigned duties described in the SOP‘s and to be followed during emergency within the District/State.

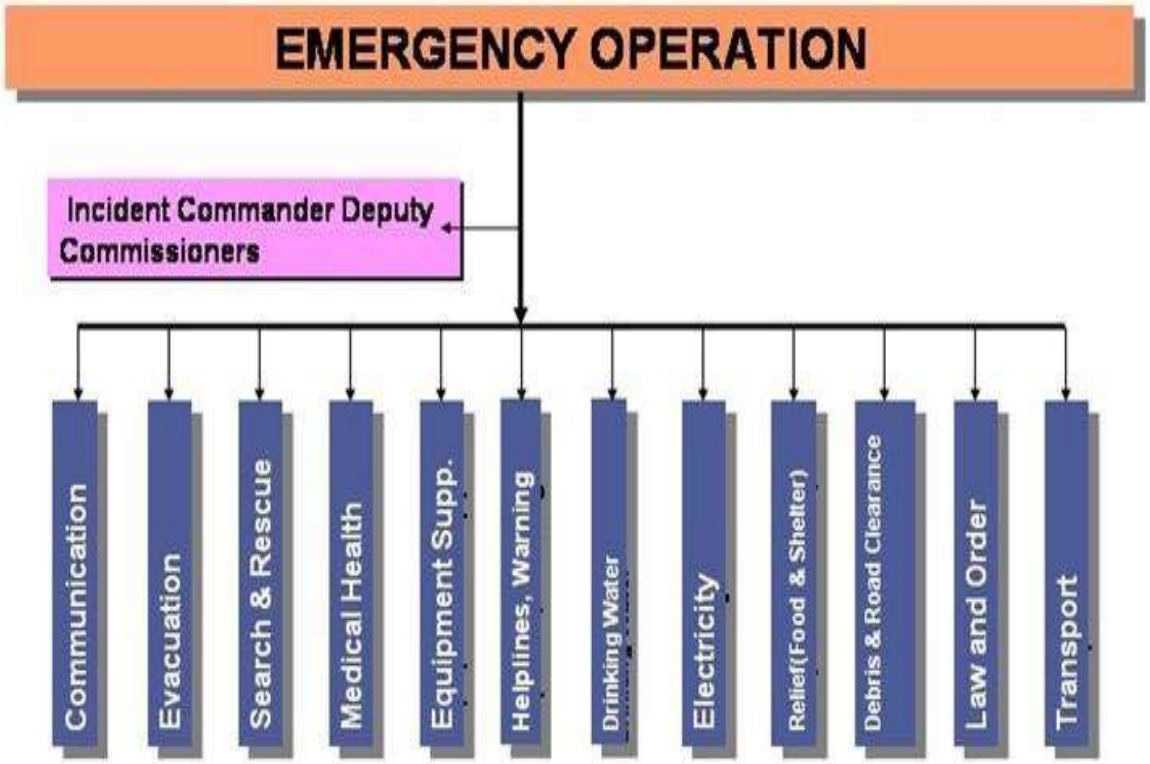


Figure 6.5: Emergency Support Function

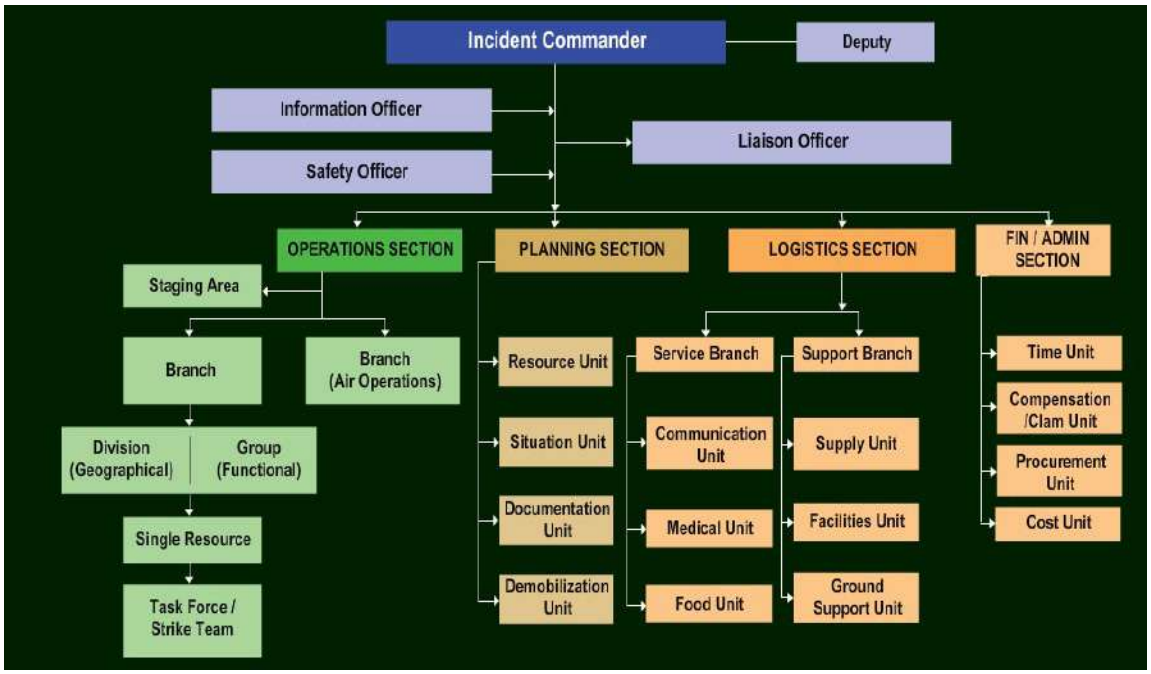


Figure 6.6: Incident Command System

RESPONSIBLE OFFICER = PRIMARILY RESPONSIBLE FOR EFFECTIVE RESPONSE

COMMANDER = OVERALL INCHARGE OF THE INCIDENT RESPONSE TEAM AND ITS EFFECTIVE FUNCTIONING

OPERATIONS = DIRECT AND SUPERVISE ALL TACTICAL ACTIONS

PLANNING = COLLECT/ANALYZE DATA, WORKOUT NEED OF REQUIRED RESOURCES AND PREPARE ACTION PLAN

LOGISTICS & FINANCE = PROVIDE LOGISTICS SUPPORT, PROCUREMENT AND COST ACCOUNTING

6.15 PRIMARY MANAGEMENT FUNCTIONS

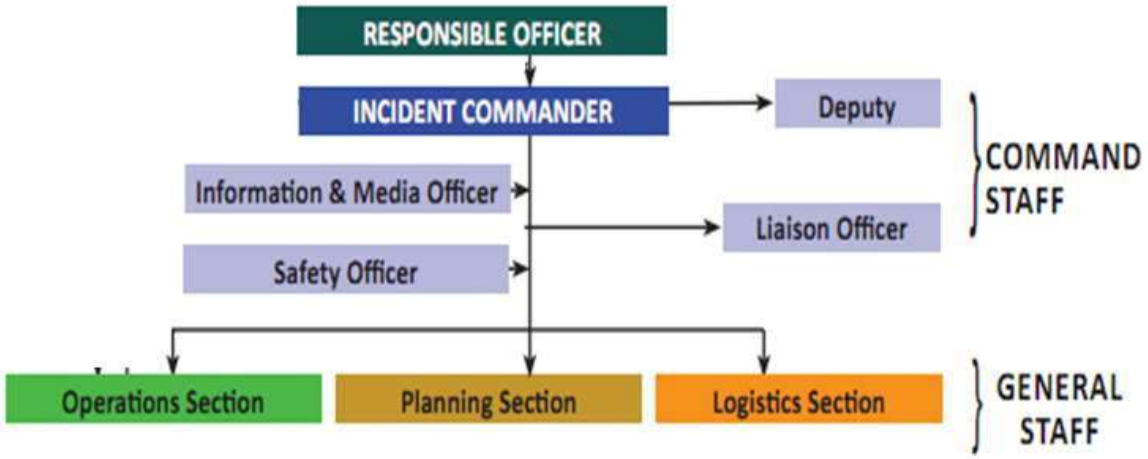


Figure 6.7: Incident Command System

Features of IRS

1. Management by objectives & Incident Action Plan
2. Flexibility
3. Span of control
4. Multi Tasking
5. Accountability
6. Resource Management
7. Common Terminology
8. Unity of command and chain of command
9. Transfer of Command
10. Unified Command
11. Medical Plan
12. Communication Plan
13. Demobilization Plan

6.16 MANAGEMENT BY OBJECTIVES & INCIDENT ACTION PLAN

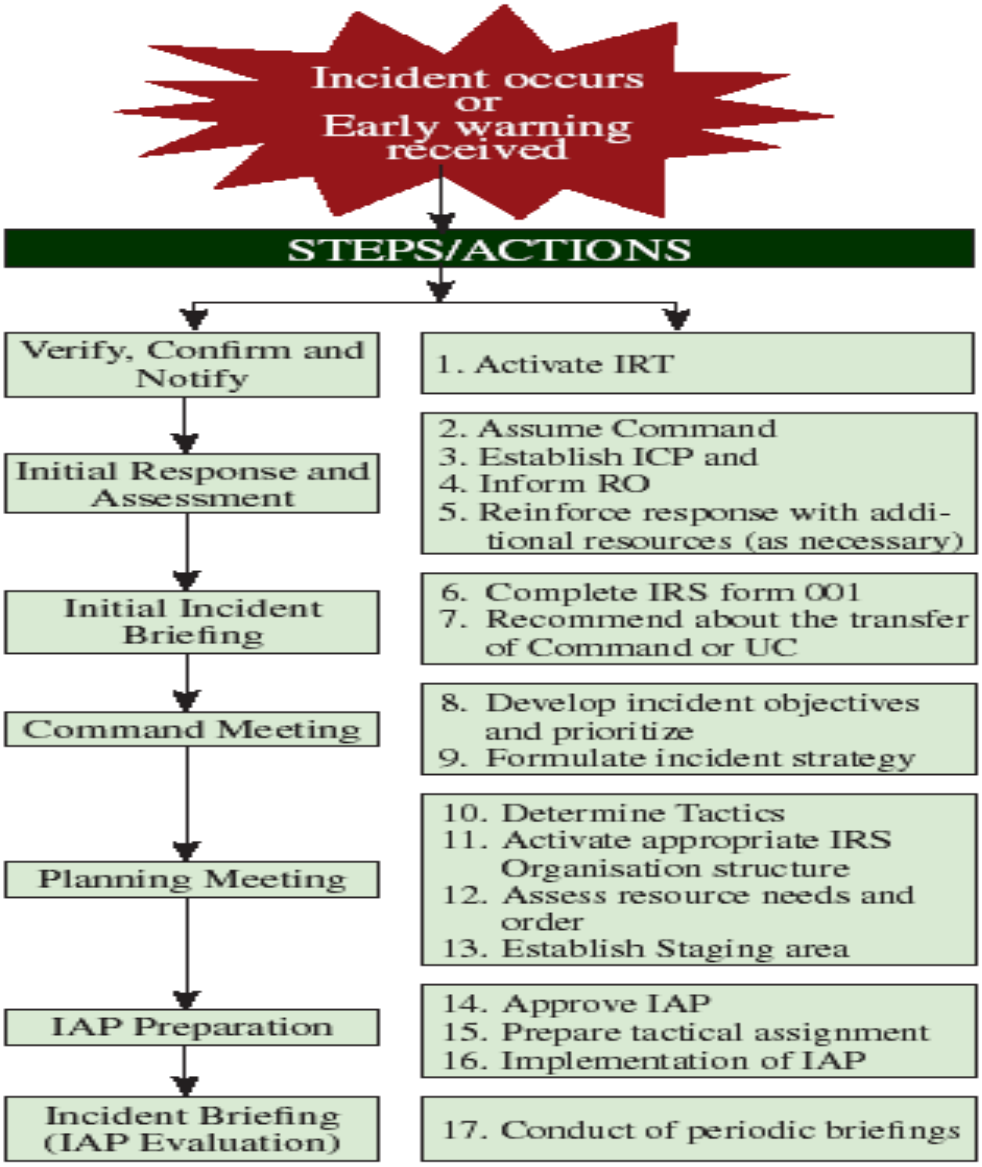


Figure 6.8: Early warning

6.17 IRT FOR BIG INCIDENT

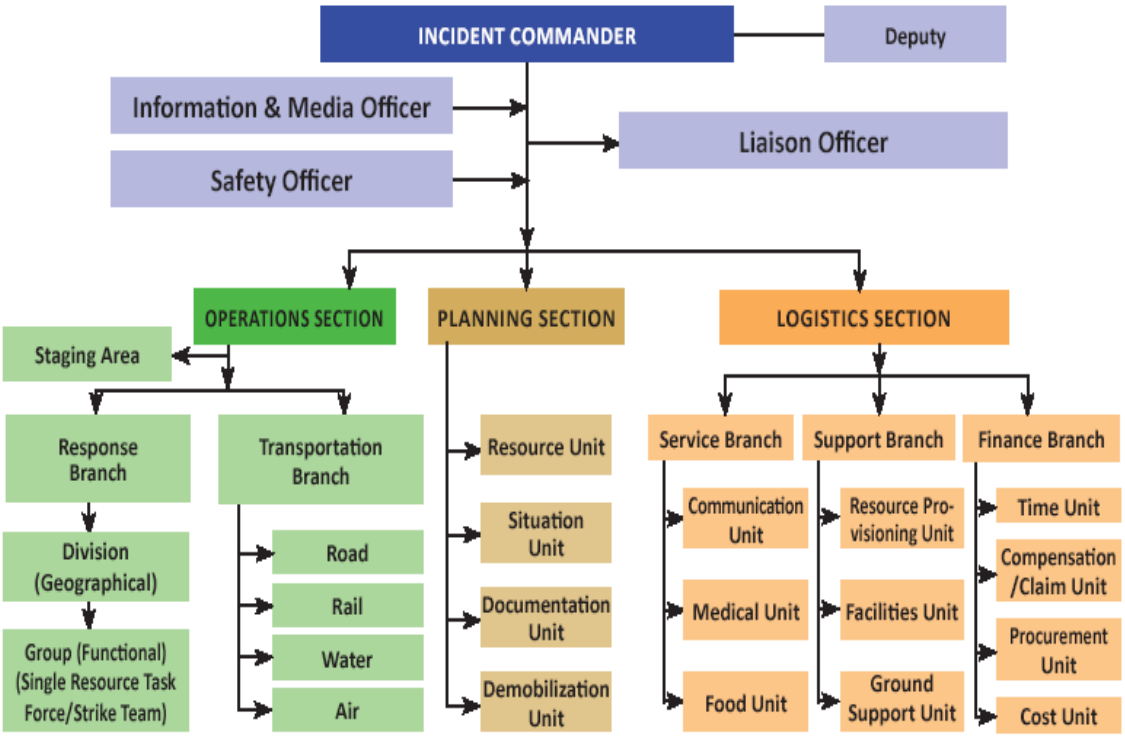


Figure 6.9: IRT for big incident

6.18 IRT FOR SMALL INCIDENT

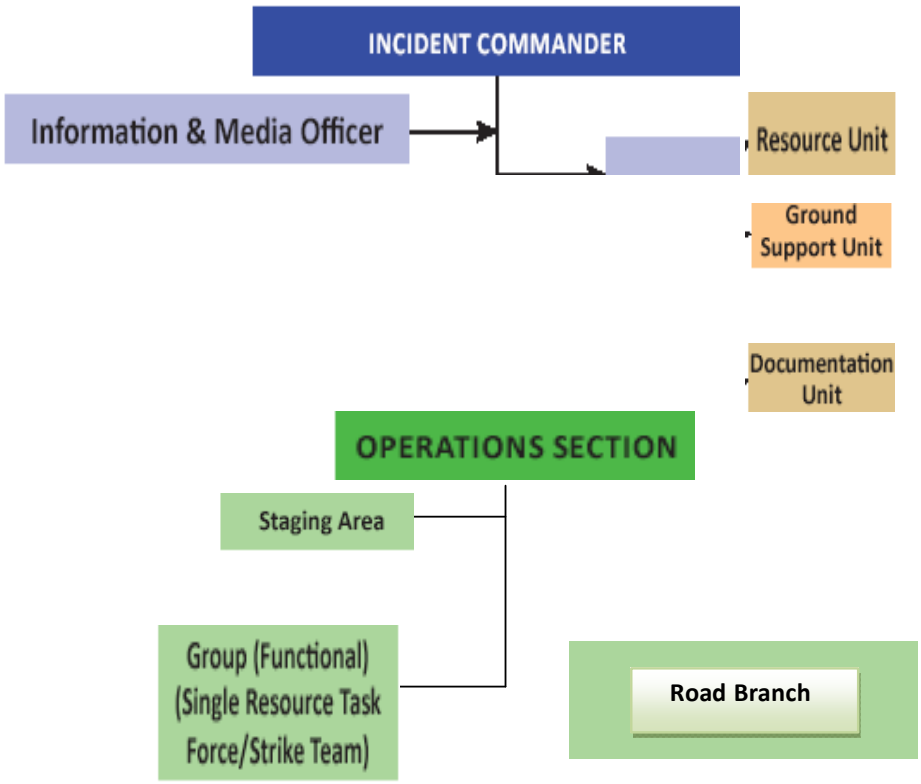


Figure 6.10: IRT for small incident

Forms and Formats

1. **Incident Briefing forms**
2. **Unit Log**
3. **Organization Assignment List**
4. **Incident Check-in & Deployment List**

6.19 Unified Command

Unified Command is a system that allows all agencies with jurisdictional responsibility for the incident, either geographical or functional, to manage an incident by establishing a common set of objectives and strategies under one commander without losing or abdicating agency authority, responsibility or accountability.

6.20 Area Command

Area Command is an expansion of the Incident Response function, primarily designed to manage a very large number of incidents that has multiple IRTs assigned or area being isolated because of geographical reasons.

It is established for overseeing response and to ensure that conflicts, jurisdictional or otherwise, do not arise amongst deployed responding teams.

6.21 Transfer of Command

The Transfer of Command in any incident may take place for the following reasons:

- When an incident becomes overwhelming for the IC and IRT;
- More qualified and experienced senior officers arrive at the scene;
- The incident situation changes over time, where a jurisdictional or agency change in command is operationally required; and
- Normal turnover of personnel in the case of long or extended incidents.

6.22 IRS standard symbols:-

Incident Command Post ……

Staging Area……..

Base……

Camp……..

Relief Camp……...

Heli Base……..

Heli Pad……

6.23 INCIDENT COMMAND POST

The ICP is the location at which the primary command functions and coordination are performed. The IC will be located at the ICP. There will only be one ICP. This also applies to situations with multi-agencies or multi jurisdictional incidents operating under a single or Unified command. Normally ICP is not relocated.

6.24 Staging Area

The Staging Area is an area where resources are collected and kept ready for deployment for field operations. These may include things like food, vehicles and other materials and equipment.

The SA will be established at a suitable area near the affected site for immediate, effective and quick deployment of resources.

6.25 Camps

When incidents are widespread and far away from the base, camps may have to be opened at different locations. Camps are temporary locations to provide services to incident personnel. Camps may be moved – from one place to another. All Base activities may be performed at Camps. Camps should be designated by names or number and should have prominent banners/signage.

6.26 TRIGGERING MECHANISM WITH EARLY WARNING

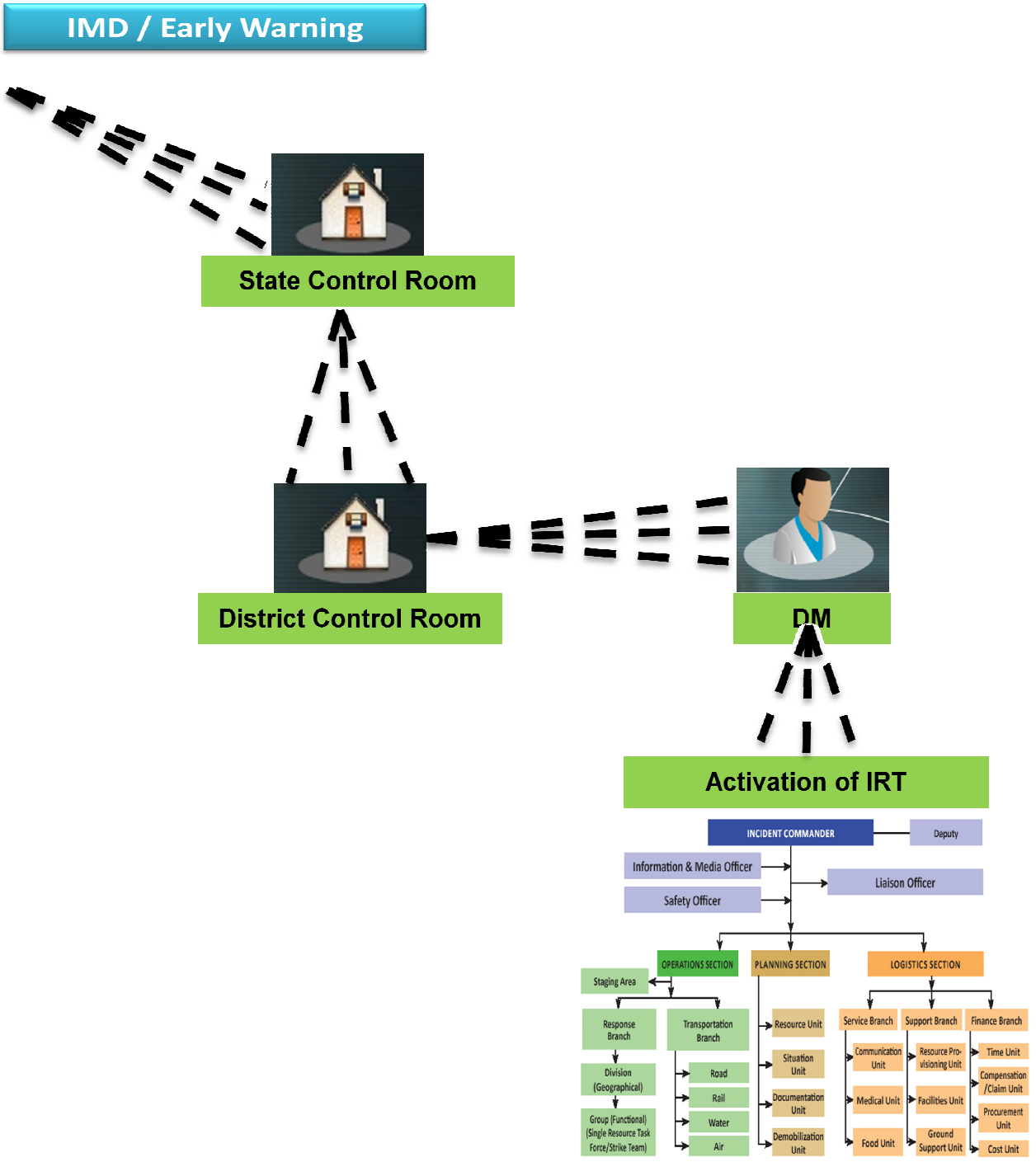


Figure 6.11: TRIGGERING MECHANISM WITH EARLY WARNING

6.27 TRIGGERING MECHANISM WITHOUT EARLY WARNING

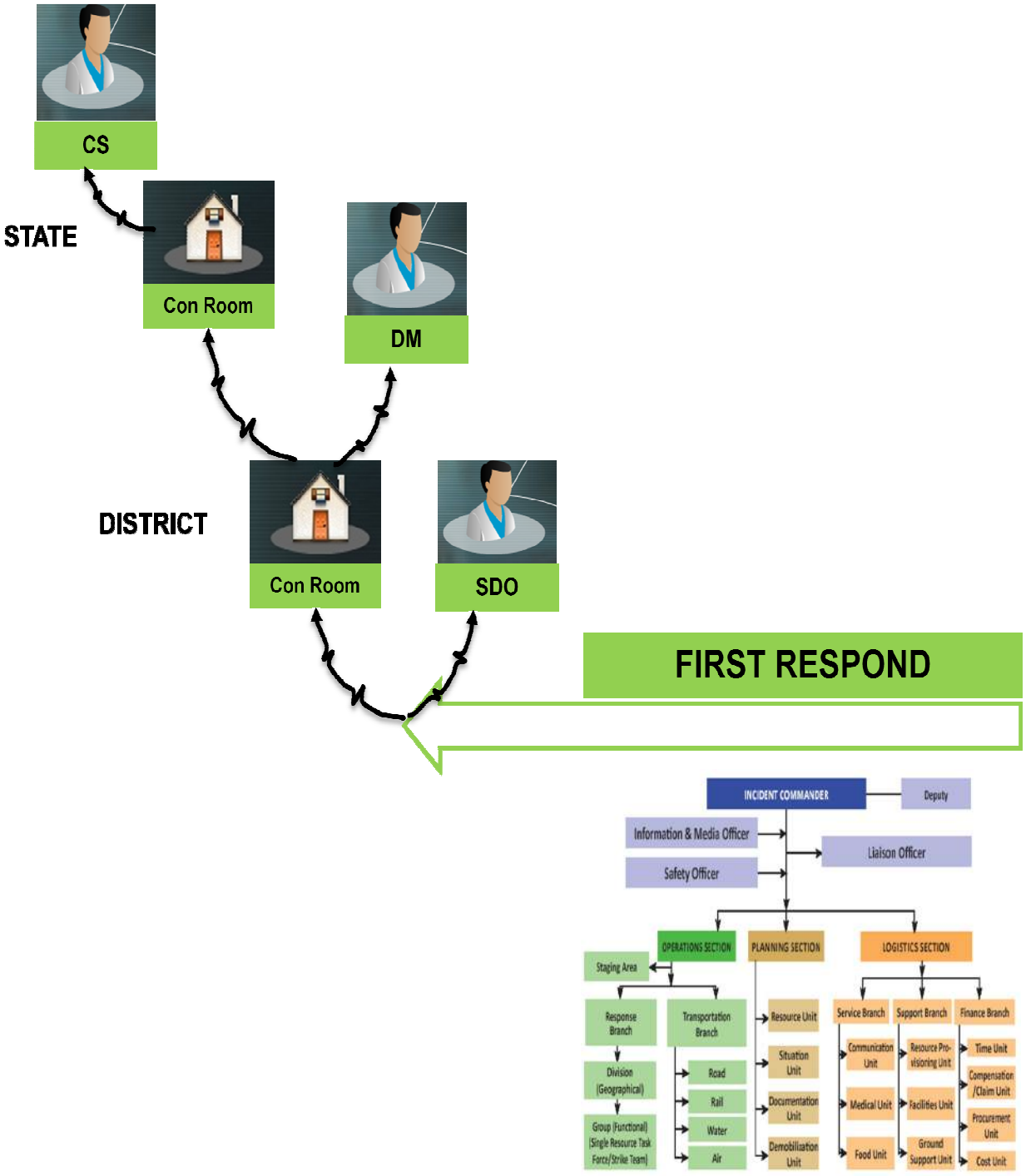


Figure 6.12: TRIGGERING MECHANISM WITHOUT EARLY WARNING

6.28 EOC Operations

The operation of the EOC will be at L0 level of maintenance pursuing the following activities:

6.29 Regular Functions of EOC during Normal Times

1. Updating and Maintenance duties of the EOC.
2. Managing Inventories and reviewing existing logistic facilities.
3. Keeping updated with other hazard, weather and terror events across the world.
4. Tracking and documenting new forms of disaster response measures and technology used around the world. Innovating these in the context of the state of Maharashtra.
5. Capacity Building including dry exercises and other preparedness and training exercises.
6. To ensure the continuous operation of the regular Public Safety facilities at all times.
7. The EOC is normally staffed twenty-four hours a day during seasons of extreme weather events and therefore it can quickly be activated for any emergency. When a major emergency occurs, or is imminent, it will be the responsibility of the Emergency Coordinator to set up and staff an appropriate Emergency Operations Center (EOC). The EOC is usually activated at the orders by Chief Secretary at the State level or the collector in the district level respectively. The activation of EOC should normally occur when the Government proclaims a State of Emergency affecting the area due to weather, hazardous materials, terrorism, etc. It also depends upon the severity and nature of the hazard event. It should be noted that the activation of EOC should be followed by the issuance of warning by nodal technical agencies. When the situation returns to normal, automatically the response operations cease and the EOC staff strength also reduced automatically. The deactivation of EOC takes place upon the receipt of Chief Secretary's order.
8. In case of extreme disasters such as chemical disasters, bomb blasts and terrorist attacks, national security and control takes precedence. The Ministry of Home has to establish special measures to ensure the security of the nation by sealing and evacuating strategic government and national institutions well within 3-4 hours of the occurrence. National borders, air and sea space also have to be protected and if need be, sealed off. The designated officers of the Home Guards at the EOC will provide security to the EOC entrance points. In addition to EOC staff, the authorized individuals are allowed by the Home Guards to enter the EOC.

6.30 EOC Levels of Operation

The EOC activation at various levels depends on the level of disaster. The National/State/District EOCs are activated in the L3, L2 and L1 levels of disasters respectively.

EOC Levels of Operation

Level	Nature of EOC Operation
Level 1 (L1)	**Normal**: Situation is monitored by EOC incharge.
Level 2 (L2)	**Watch**: When an event / disaster may occur, notification is made to agencies and support staff who would need to take action as part of their responsibilities.
Level 3 (L3)	**Partial Activation**: Limited activation of EOC when an event / disaster is very Probable or following an event which doesn't require full activation. All primary or lead staff will be notified and will staff the EOC.
Level 4 (L4)	**Full Scale Activation:** All primary and support agencies are notified. All EOC Support personnel will staff the EOC.

6.31 Immediate Tasks on EOC Activation

The Chief Secretary will initiate the activation of the emergency services of the EOC as established.

6.31.1 Immediate Tasks upon EOC activation…

1. The Chief Secretary will determine what staff he/she deems necessary to effectively operate the EOC apart from the prescribed staff. The Personnel from various departments and agencies are called to work in the EOC.
2. Orders are faxed from the crisis management committee to related ministries and departments for additional resources.
3. The emergency operation task forces are asked to send report on the situation and their immediate resource requirements to the EOC within 4-8 hours of activation.
4. The EOC produces a situation report summarizing these reports.
5. Records will be maintained in the emergency control room.

EOC Tasks during emergency phase as suggested by HPC

First 24 hours of the emergency….

1. Establishing control rooms at the airport with information desks at the arrival, departure and assembly points.
2. Set up General Information Desk at airport EOC.
3. Establish and activate emergency phone lines and helplines immediately within few hours of the disaster.
4. Set up separate desks for each ESF and international aid /NGO.
5. Set up desks for donations (cash and material).
6. Establish contact with the affected State EOC.
7. Establish contact with NRSA/ISRO/Defence for aerial and satellite imageries of the affected area.
8. Provide information and standard operating procedures for civilian population such as media, researchers, volunteers, field workers, etc. through:
    - Organize/coordinate aerial surveys for rescue operations.
    - Establish contact with the disaster site which will have Incident Command Systems placed at the disaster site based on the scale of the disaster.
    - Deploy Incident Commanders in consultation with the Center at strategic incident commands.

Next 48 Hours….

EOCs at the State and the Central levels will be jointly involved in the following:

1. Set up information desks at critical locations.
2. Identify and channelize different categories of workers under the following at the information desks and provide identification tags for the following:
    - Media
    - Researchers
    - NGO/International Agency
    - Field workers/Volunteers
    - Government officials
3. Place situation reports at bulletin boards outside information desks and EOC.
4. Direct Central and international agencies to priority areas (worst affected areas).
5. Identify locations for international and other NGO agencies to set up their site offices for the uniform distribution of aid in all parts of the affected area.
6. Communicate with the District Magistrate and the SRC for local information through:
    - Information flow chart of Information and Arrival Centre at airport.
    - Material/Manpower flow chart of Information and Arrival Centre at airport.
    - Information flow chart of EOC at Centre.
    - Information flow chart of desk for ESF.

6.32 EOC Communication

The Telecommunication Task Force Leader of the EOC shall ensure immediate restoration of disrupted communication facility or infrastructure to ensure uninterrupted communication for effective disaster management operations. The task force will also ensure that the communication shall be brief and simple, and no chaotic situations arise. Telephones or Hot Lines shall be used wherever possible to avoid congestion of radio communication. All task force members shall communicate only through their allotted frequency channel to avoid congestion in the particular channel. The personnel who use radios should be acquainted with the operation of the equipment, various channels, code words, length of speech, etc. The EOC has an important role in issuing early warning.

6.33 EOC Information Center Management

The principal role of information center in the EOC constitutes collection of data, analysis and dissemination of information to relevant organization. Upon the activation of EOC, this

center coordinates the flow of information with respect to activities associated with relief operations. During normal times, it maintains a systematic database of the resources available, important phone numbers, name and addresses of important government officials, EOC emergency staff members, trained officials and first responders, international aid agencies and NGOs. The EOC- information center does damage assessment of the affected areas, collect all related information of government schemes for smooth management, monitors different disaster mitigation programmes, coordinate with different organizations, also conducts evaluation of the programmes and immediately takes up.

6.34 Preliminary Steps to Set Up an Emergency Operations Center

While setting up of an EOC, the following aspects should be given due consideration:

a) **Number of people involved:** The number of people at an EOC should be limited to the people directly involved in the EOC operations.

b) **Presence of decision makers and operations staff:** All key individuals involved in decision making and executing them needs to be present at the EOC, as and when policy decisions are being taken.

c) **Communications and other equipment:** The EOC should have sufficient physical space and support equipment to enable staff to operate effectively. An EOC requires the best available communications and other equipment to operate efficiently. However, the lack of equipment should not be used as an excuse for not setting-up an EOC. Runners can work in the place of radios, paper and pens in the place of computers and printers, and chalk boards in the place of white boards.

d) **Information Resources:** The EOC should contain maps and documentation on other relevant resources needed to respond to a disaster.

e) **Alternate sites:** There should always be an alternate site for the EOC in case it has to be abandoned.

f) **Knowledge of the EOC location**: Only those who need to know where the EOC is located should be told its exact location.

6.35 EOC Basic Requirements

- **Site or Location of the EOC:** The Emergency operation center (EOC) should be established near the office of key government functionaries and is ideal to be positioned away from the disaster scene. As per the recommendations of the HPC, a

network of EOCs is to be set up in national, state capitals and headquarters of disaster prone or vulnerable districts.

- **EOC Space Requirements:** Following table suggests the space required for specific functions of the EOC.

Table 6.2 : EOC Space Requirements

Functions	Space Requirement
Policy Makers	A separate room from the main EOC area, often designed also as a conference room.
Media Information Provision	Separated from the main EOC area.
Communication and Data Processing	Designed separately from the main EOC as a Radio Room. It should include computer servers and similar equipment's.
Incident Commander	Separate cabin for the Incident Commander
Task Forces	Space for up to 15 Task Forces. Each task force should be provided separate desks, which is able to host atleast 3-4 persons at a desk at a time.
Logistics Coordination	Desks and space to host five persons
Administrative Personnel	Desks and space to host five persons
Finance Personnel	Desks and space to host five persons
Restrooms and Toilets	Restrooms and toilets for personnel at EOC

While designing EOCs, specific attention should also be given to aspects related to the electrical/data circuit layout, security considerations, lighting considerations, projection displays, visual aids, equipment, communication considerations, UPS/backup power considerations, and functional considerations with a view toward avoiding potential pitfalls in design, construction, and equipment functionality.

6.36 EOC Equipment

A list of equipment that is essential for the Emergency Communication Centre of the EOC is given below.

6.36.1 Emergency Communication Centre – Essential Equipment…

- Radio communications supported with capabilities on all public safety frequencies
- Amateur radios (multiple bands)
- Secure satellite telephone
- Doppler weather radar and infrared satellite imagery
- Quick-call and community siren warning system
- Emergency Alert System encoder/decoder
- Primary telephones, backup phone system and dedicated circuits
- Group paging terminals
- Fax machines
- Internet (both network and dial-up as a redundancy)

6.37 Back up Control Room

In case of rare incidents or disasters, the EOC building may be severely damaged and cease to function. In that case a backup EOC or a temporary set up can be used for coordination and control of emergency operation. The HPC has emphasized on setting up of Back up EOCs at all levels right from National level to district levels. In the context of Maharashtra, it is advisable to have two EOCs at the State level, one positioned at Mantralay Mumbai while the second state level EOC is set up at YASHADA Pune.

6.38 Alert Mechanism – Early Warning

On the receipt of warning or alert from any such agency which is competent to issue such a warning, or on the basis of reports from District Collector of the occurrence of a disaster, the response structure of the State Government will be put into operation. The Secretary (Revenue) will assume the role of the Chief of Operations during the emergency situation. The details of agencies competent enough for issuing warning or alert pertaining to various types of disasters are given below.

Table 6.3 Agencies involved in issuing first alert

Disaster	Nodal Agencies
Earthquakes	IMD, ISR, GSI
Floods	IMD, Irrigation Department
Windstorm/ Rains/ Cloudburst/ Heat waves/	IMD, Revenue Department
Landslide/Snow Avalanche	IMD, ISR, SASE
Drought	Agriculture Department
Epidemics	Health & Family Welfare Department
Industrial & Chemical Accidents	Industry, Labour & Employment
Fire	Fire & Emergency Services

The occurrence of the disaster will be communicated to the Governor, Chief Minister, Home Minister, State Cabinet, Guardian Minister of the district, and non-officials namely MPs and MLAs from the affected district. The PMO, Cabinet Secretary, Secretary-Home and Defence, NDMA, MHA, Command Officers will also be appraised of the situation.

The EOCs and ERCs will be put on full alert and expanded to include Branch arrangements, with responsibilities for specific tasks, depending on the nature of disaster and extent of its impact. The number of branches to be activated will be decided by the Chief of Operations. i.e. Financial Commissioner (Revenue) and Relief Commissioner at the State level and respective Deputy Commissioners / District Collectors at the District level. All line departments and nodal officers will work under the overall supervision and administrative control of the Chief of Operations. All the decisions taken in the EOC have to be approved by the Chief of Operations. Immediate access to the disaster site through various means of communications such as mobiles, VSAT, wireless communication and hotline contact needs to be established and maintained. As mentioned earlier, the EOCs and ERCs in its expanded form will continue to operate as long as the need for emergency relief and operations continue and the longer term plans for rehabilitation are finalized. For managing long-term rehabilitation programmers, such as reconstruction of houses, infrastructure and other social amenities, the responsibilities will be that of respective line departments through a well-structured R & R Program.

6.39 Search and Rescue

The District Collector, in conjunction with local authorities will be responsible for the search and rescue operations in an affected region. In doing so, the Collector will be guided by relevant disaster management plans and will be supported by Government departments and local authorities. Table 6.8 shows the key components and actors of the rescue services.

Key Components and Actors in Rescue

Components	Tasks	Responsibility
Rescue Service	➢ Rescue the victims under debris in damaged buildings. ➢ Give necessary first aid to such casualties at the post before rescue. ➢ Recover the dead bodies. ➢ Carry out demolition of dangerous structures and remove debris.	Rescue Team consist of : • Paramedical Staff • HomeGuard • Police personnel Other actors include: • Fire Services • Paramilitary forces • Civil Defence • PublicSector Undertaking (PSUs) • Civil Society • Civilians
Evacuation	➢ Shift the injured and the affected population from the disaster site. ➢ Employ sufficient manpower and material resources, transport facilities what so ever available in the district for immediate evacuation. ➢ Formation of rescue sub-committee. ➢ Civilian should be evacuated from military areas to prevent their interference with the operation of troops. ➢ Control of spontaneous exodus to prevent panicky condition.	• District Administration • SDMs • Tahsildars • Police • BDOs DFO • Range officer • Fire Brigade

Emergency Operation	➢ Rescue people trapped in burning, collapsed or damaged buildings, damaged vehicles, including motor vehicles, trains, industries, boilers and pressure vessels etc. ➢ Control fires and minimise damages due to explosions. ➢ Control other dangerous or hazardous situations such as oil, gas and hazardous materials spill. ➢ Protection of property and the environment from fire damage.	• SDM/ Tahsildars • Chairman BMO • Co-ordinator • SDPO/SHO Member • BDO Member • Executive Officer • MC Member • Zonal Education Officer • PWD • PHE • PDD

Relief/Aid	➢ District Headquarters is the focal point for all rescue and relief activities. ➢ Provide immediate first aid and relief. Carry out relief operations at one place so that control / sub- control centre can easily issue orders for movement of services. Organize relief camp. ➢ Immediate freezing of 75% stock of POL Bunkers in the districts and should be used during time of disaster followed by scarcity. ➢ Assisting in distribution of relief material. Maintaining law and order. ➢ Cash relief/ex-gratia grant to affected families. ➢ Encourage the formation of Mutual Aid and Response Groups (MARGS). ➢ Prepare a damage list to by conducting a preliminary damages assessment at Tahsil/bock Level/Panchayat	• Police • Fire Services • Paramilitary forces • Civil Defence • Civilians • PSUs • Civil Society

Welfare Service	➢ Provide orphans, widows and other vulnerable people every sort of relief and rehabilitation. ➢ Establish rest centres to provide shelters, food and care to them. ➢ Establish rest centres for homeless citizens. ➢ Collect clothing from NGO's and other like Red Cross and distribute them amongst the deserving and needy people.	• Social Welfare Department • Civil Society

LIST OF ITEMS AND NORMS OF ASSISTANCE FROM STATE DISASTER RESPONSE FUNDS (SDRF) AND NATIONAL DISASTER RESPONSE FUND (NDRF)

(Period 2015-20, MHA Letter No. 32-7/2014-NDM-I Dated 8th April 2015)

Items and Norms of Assistance from SDRF and NDRF

Sr.No.	Items	NORMS OF ASSISTANCE
1.	**SEARCH & RESCUE OPERATIONS**	
	a) Cost of search & rescue measures/evacuation of people affected/likely to be affected	- As per actual cost incurred, assessed by SEC and recommended by the Central Team (in case of NDRF) - By the time the Central Team visits the affected area, these activities are already over. Therfore, the State Level Committee and the Central Team can recommend actual/near-actual costs.
	b) Hiring of boats for carrying immediate relief and saving lives.	- As per actual cost incurred, assessed by SEC and recommended by the Central Team (in case of NDRF) - The quantum of assistance will be limited to the actual expenditure incurred on hiring boats and essential equipment required for rescuing stranded people and thereby saving human lives during a notified natural calamity.
2.	**RELIEF MEASURES**	
	a) Provision of temporary accommodation, food, clothing, medical care, etc. for people affected/evacuated and sheltered in relief camps	As per assessment of need by SEC and recommendation of the Central Team (in case of NDRF), for a period up to 30 days. The SEC would need to specify the number of camps, there duration and the number of persons in camps. In case of continuation of a calamity like drought, or wide spread devastation caused by earthquake or flood etc., this period may be extended to 60 days, and upto 90 days in cases of severe drought. Depending on the ground situation, the State

		Executive Committee can extend the time period beyond the prescribed limit subject to that expenditure on this account should not exceed 25% of SDRF allocation for the year. Medical care may be provided from National Rural Health Mission (NRHM)
	b) Air dropping of essential supplies	As per actual, based on assessment of need by SEC and recommendation of the Central Team (in case of NDRF). - The quantum of assistance will be limited to actual amount raised in the bills by the Ministry of Defence for airdropping of essential supplies and rescue operations only.
	c) Provision of emergency suppy of drinking water in rural and urban areas	As per actual cost, based on assessment of need by SEC and recommended by the Central Team (in case of NDRF), upto 30 days and may be extended upto 90 days in case of drought. Depending on the ground situation, the State Executive Committee can extend the time period beyond the prescribed limit subject to that expenditure on this account should not exceed 25% of SDRF allocation for the year.
3.	**CLEARANCE OF AFFECTED AREAS**	
	a) Clearance of debris in public areas.	As per actual cost within 30 days from the date of start of the work based on assessment of need by SEC for the assistance to be provided under SDRF and as per assessment of the Central Team for assistance to be provided under NDRF.
	b) Draining off flood water in affected areas.	As per actual cost within 30 days from the date of start of the work based on assessment of need by SEC for the assistance to be provided under SDRF and as per assessment of the Central Team (in case of NDRF)

	c) Desposal of dead bodies/Carcases	As per actual, based on assessment of need by SEC and recommendation of the Central Team (in case of NDRF)
4.	**INFRASTRUCTURE**	
	Repair/Restoration (of immediate nature) of damaged infrastructure: 1) Roads & Bridges 2) Drinking Water supply works. 3) Irrigation 4) Power (only limited to immediate restoration of electricity supply in the affected areas), 5) Schools, 6) Primary Health Centres, 7) Community Assets owned by Panchayat. Sectors such as Telecommunication and Power (except immediate restoration of power supply), which generate their own revenues, and also undertake immediate repair/restoration works from their own funds/resources, are excluded.	Activities of immediate nature: Illustrative lists of activities which may be considered as works of an immediate nature are given in the enclosed Appendix. Assessment of requirements: Based on assessment of need, as per States's costs/rates/schedules for repair, by SEC and recommendation of the Central Team (in case of NDRF) - As regards repair of roads, due consideration shall be given to Norms for Maintenance of Roads in India, 2001, as amended from time to time, for repairs of roads affected by heavy rains/floods, cyclone, landslide, sand dunes, etc. to restore traffic. For reference these norms are • Normal and Urban areas: upto 15% of the total of ordinary repair (OR) and Periodical Repair (PR) • Hills: upto 20% of total of OR and PR - In case of repair of roads, assistance will be given based on the notified Ordinary Repair (OR) and Periodical Renewal (PR) of the State. In case OR & PR rate is not available, then assistance will be provided @Rs. 1 lakh/km for State Highway and Major District Road and @ Rs. 0.60 lakh/km for rural roads. The condition

		of "State shall first use it's provision under the budget for regular maintenance and repair" will no longer be required, in view of the difficulties in monitoring such stipulation, though it is a desirable goal for all the States. - In case of repairs of Bridges and Irrigaion works, assistance will be given as per the schedule of rates notified by the concerned States. Assistance for micro irrigation scheme will be provided @ Rs. 1.5 lakh per damaged scheme. Assistance for restoration of damaged medium and large irrigation projects will also be given for the embankment portions, on par with the case of similar rural roads, subject to the stipulation that no duplication would be done with any ongoing schemes. - Regarding repairs of damaged drinking water schemes, the eligible damaged drinking water structures will be eligible for assistance @ Rs. 1.5 lakh/damaged structure. - Regarding repair of damaged primary and secondary schools, primary health centres, Anganwadi and community assets owned by the Panchayats, assistance will be given @ Rs. 2 lakh/damaged structure. - Regarding repair of damaged power sector, assistance will be given to damaged conductors, poles and transformers upto the level of 11 KV. The rate of assistance will be @ Rs. 4000/poles, Rs. 0.50 lakh per km. of damaged conductor and Rs. 1.00 lakh per damaged distribution

		transformer.
5.	Procurement of essential search, rescue and evacuation equipments including communication equipments, etc. for response to disaster.	- Expenditure is to be incurred from SDRF only (and not from NDRF), as assessed by the State Executive Committee (SEC) - The total expenditure on this item should not exceed 10% of the annual allocation of the SDRF.
6.	Capacity Building	- Expenditure is to be incurred from SDRF only (and not from NDRF), as assessed by the State Executive Committee (SEC). - The total expenditure on this item should not exceed 5% of the annual allocation of the SDRF.
7.	State specific disasters within the local context in the State, which are not included in the notified list of disasters eligible for assistance from SDRF/NDRF, can be met from SDRF within the limit of 10% of the annual funds allocation of the SDRF.	- Expenditure is to be incurred from SDRF only (and not from NDRF), as assessed by the State Executive Committee (SEC). - The norm for various items will be the same as applicable to other notified natural disasters, as listed above. or - In these cases, the scale of relief assistance against each item for 'local disaster' should not exceed the norms of SDRF. - The flexibility is to be applicable only after the State has formally listed the disasters for inclusion and notified transparent norms and guidelines with a clear procedure for identification of the beneficiaries for disaster relief for such local disasters', with the approval of SEC.

6.40 Specific Contingency Plans

6.40.1 Contingency actions for floods

Sr. No	Key Actions	Responsibilities
TIME FRAME : PRE FLOOD ACTIONS (PREPARATORY)		
1.	Convening a meeting of the DDMA official, EOC and other concerned institutions to take stock of department wise preparations.	DDMA Chair
2.	Take stock of functioning of the EOC and Control Rooms;	DDMA Chair
3.	Closure of past breaches in river and canal embankments and guarding of weak points;	
4.	Rain-recording and submission of rainfall reports.	Water resource dept.
5.	Communication of gauge-readings and preparation of maps and charts;	Water resource dept.
6.	Assigning charge of flood Circles;	DDMA Chair
7.	Dissemination of weather reports and flood bulletins issued by the meteorological Centres, Central Water Commission, Flood Forecasting Organisation;	EOC
8.	Deployment of boats at strategic points (most sensitive embankments);	DDMA
9.	Arrangement and use of power / motor boats;	DDMA
10.	Installation of temporary Police Wireless Stations and temporary telephones in flood-prone areas;	Police dept., BSNL
11.	Arrangement for keeping telephone and telegraph	BSNL
12.	Storage of food in interior, vulnerable strategic and key areas and arrangements for their safety	Food Supplies dept.
13.	Arrangements of dry food stuff, essential medicines and other necessities of life;	Food Supplies dept., Revenue Dept.
14.	Alternative drinking water supply arrangements;	PHED
15.	Arrangements for keeping the drainage system desilted and properly maintained.	Water resource dept.
16.	Appropriate measures for Health, Veterinary services etc.	Health & Animal & fishery
17.	Identification / Selection of flood shelters;	Revenue, DDMA
18.	Advance arrangements for army assistance if	DDMA
19.	Training of department employees in flood relief work;	DDMA

Sr. No.	Key Actions	Responsibilities
TIME FRAME : POST FLOOD ACTIONS (RESPONSE)		
20.	Report the occurrence of flood to DDMA, Heads of all line departments, ESF Nodal agencies, DDMC	EOC
21.	Establish communication links by activating alternate communication equipments i.e. satellite phone, HF/ VHF set, HAM radio, VSAT etc.	EOC
22.	Deploy mobile emergency communication unites to affected areas for establishing communication link	EOC
23.	Verify the authenticity of the flood event from agencies like IMD, ISR, block level officers, police and fire department etc.	EOC
24.	Organize first meeting of duty officers	DDMA Chair
25.	Organising and despatch the search rescue teams to the affected areas.	DDMA Chair
26.	Ask for SDRF/NDRF/ Army assistance as per requirement.	DDMA Chair
27.	Organise relief camps and flood shelters	Revenue dept.
28.	Provision of safe drinking water to the affected communities.	PHED dept.
29.	Organising controlled kitchens to supply foods initially at least for 3 days.	Revenue & Food
30.	Provision of health, sanitation and hygiene facilities	Health Dept., PHED, NGOs and Community Groups
31.	Making necessary arrangements for air dropping of food packets in the marooned villages through helicopters.	DDMA Chair
32.	Organising cattle camps, if necessary, and provide veterinary care, fodder and cattle feed to the affected.	Animal and Fisheries dept.
33.	Submission of daily reports and disseminate correct information through mass media and DDMA website to avoid rumors.	Revenue dept
34.	Rehabilitation of homeless people	EOC

35.	Commencement of agricultural activities-desiltation, resowing	Revenue dept
36.	Maintain constant communication with the onsite EOCs	EOC
37.	Initiate relief distribution and recovery actions	Revenue dept

6.41 Contingency actions for Drought

6.41.1 Drinking Water:

- Make detailed plans to supply drinking water in areas through bores, tanker special trains and other suitable measures.
- Monitor continuously rural and urban drinking water availability in drought affected areas.

6.41.2 Water Resources:

- Prepare a water budget for each irrigation reservoir covering drinking water, kharif and rabi requirements and evaporation losses.
- Undertake repairs of tube wells to make all tube wells operational and install additional tube wells taking care at the same time to prevent over-exploitation of and damage to ground water regime.
- Regulate supply to water-intensive industries, if necessary.
- Minimise evaporation losses in tanks and small reservoirs by using chemical restorants subject to Health clearance.

6.41.3 Employment Generation:

- Adequate scarcity relief works to be taken up to generate the required employment.
- The funds available under employment generation scheme like MGNREGA., and scarcity relief etc. should be dovetailed and integrated.
- Projects should be kept ready to be taken up for employment generation during drought.
- Drought proofing schemes to be identified and to be given higher priority.

6.41.4 Fodder:

- Assess fodder requirement in the district and locate areas where shortages are likely to occur and arrange for supplies from outside.
- Monitoring the prices of fodder in selected places/markets.
- Arrange to procure fodder from surplus districts/ States.

- State Forest Departments to arrange for the cutting and bailing of grasses in the forests, wherever possible to meet the demand from fodder deficit districts.
- Fodder cultivation to be encouraged wherever feasible.
- Ensure supply of molasses to cattle feed plants.

6.41.5 Public Health:

- Disinfect drinking water sources to prevent the spread of water-borne diseases.
- Draw up plans to cope with likely epidemics.
- Constant surveillance of public health measures including immunisation to be undertaken.

6.42 Contingency actions for Crowd Management

6.42.1 Location and structure of pandals and Mela

- In case the road is less than 15 ft in width, a minimum passage of 4 ft needs to be left unoccupied. In case the road is 15 ft to 30 ft wide, a minimum of 6 ft space has to be left open. In case the road is over 30 ft wide, a minimum passage of 10 ft has to be ensured.
- There must be 4 ft clear open space on all sides from the property line of any building, boundary wall or any other permanent structure.
- The height of the superstructure can be no more than 40 ft.
- Separate entrance and exit gates to be built in such a manner that in case of a fire or other exigencies, immediate measures can be taken.
- The gates shall measure at least 12 ft by 14 ft. The entry passage to the pandal should be wide enough to allow access to a fire brigade without any obstruction.
- Pandals should not be constructed within 100 meters of a hospital or nursing home.
- Pandals should withstand wind velocity.
- Proper lighting must be ensured.
- There should be enough emergency exits. These should be free of obstruction.
- There must be a public address system.
- CCTVs must be installed at vantage points (entry, exit, inside circulation) for security reasons.
- Alternative sources of energy/generator must be available.
- Standby emergency light should be arranged.

- Display of hoardings/banner is not to be allowed within 50 meters of the important roads and intersections that may divert the attention of drivers or disrupt traffic.
- Enough police/home guards and other security forces must be deployed at the event.
- Each puja pandal/organizers of such fares and events must have a disaster management plan for the event.

6.43 Fire Safety:

- No open flame can be lit within 200 yards of the main pandal and no cooking arrangements would be allowed within that radius.
- Adequate quantity of water, sand filled buckets and fire extinguishers are required to be maintained.
- Only specific materials for construction of puja pandals should be used.
- Licensed electrical contractors should be engaged for lighting.
- Old or naked wires should not be used. Wires should not touch the cloth portion of the pandal.
- Organizers must obtain NOC (or safety certification) from Fire Brigade and Police.
- No synthetic material /ropes should be used.
- No structure should be erected underneath live electrical lines.
- No combustible straw, sheaving, flammable, explosive chemicals to be stored inside the pandals.

6.43.1 Necessary arrangements for visitors:

- 75 percent of the space in the pandal area must be kept free for crowd circulation.
- Pandals must have proper ventilation.
- Proper drinking water arrangements must be made in the pandal area.
- Toilets (separate for ladies and gents) must be arranged.
- Organizers should engage sufficient number of volunteers. They should be trained in crowd circulation.
- Clear signage should be placed at each important point showing entrance, exit gates, emergency exits, location of fire extinguishers/water hydrants, first aid kit (or medical response unit) etc.
- Map/design of the pandal/puja place must be displayed at the entrance for the visitors.
- A health unit with doctors and necessary medicines must be deployed at the event for any

emergency.

- There must be an information desk to give necessary information to the visitors and others.

6.44 Earthquake contingency actions

Key actions and responsibilities during earthquake emergency response (First 72 hours)

Sr. No.	Key Actions	Responsibilities
TIME FRAME : ADVANCE PREPARATORY ACTIONS		
1.	Training of Personnel on EQ safety,	DDMA
2.	Establishment of alternative means of communication.	BSNL
3.	Mobilisation plan of Fire Services	Fire Service dept.
4.	Plans of rescue of casualties trapped	Fire Service, civil defence
5.	Provision of hospital, medical and first aid.	Health dept
6.	Medical plans for improvised first aid	Health dept
7.	Plan for removal of debris.	Fire service
8.	Plan for emergency sanitation,	Water supply dept
9.	Provision of welfare facilities e.g. of homeless, establishment of Games, information and guidance on essential	Social welfare dept. Revenue dept Food supplies dept.
10.	Plan and arrangements for disposal of the casualties.	Police dept., civil defence
11.	Mobilisation of transport.	Transport dept
12.	Requisitioning of vehicles and issue of petrol, oil, lubricant, spare parts and	Transport dept
13.	Plan for protection of properties including objects of art and things of	Building dept
14.	Special measure for the	DDMA
15.	Publicity, information, & dissemination,	DDMA

Sr. No.	Key Actions	Responsibilities
	TIME FRAME : 0 + 15 MINUTES	
16.	Report the occurrence of earthquake to DDMA, Heads of all line departments, ESF Nodal agencies, DDMC	Officer-in-charge of EOC
	TIME FRAME : 0 + 30 MINUTES	
17.	Establish communication links by activating alternate communication equipments i.e. satellite phone, HF/VHF set, HAM radio, VSAT etc.	Officer-in-charge of EOC
18.	Deploy mobile emergency communication units to affected areas for establishing communication link	BSNL
19.	Activate the DMTs, QRT, FRT, ESFs etc.	DDMA Chair
20.	Ask all desk officers/ team leaders and Incident Command Team members to immediately report to the EOC.	Officer-in-charge of EOC
21.	Verify the authentic of the incident from agencies like IMD, ISR, block level officers, police and fire department etc.	Officer-in-charge of EOC
22.	DDMA and EOC together analyze the information and take decision on the level of the disaster (viz. Village level, block level, sub-division level, district level etc.).	DDMA Chair
23.	Organize first coordination meeting with the ESF team leaders, District IAG, and the officials from the affected areas. IAG member representative from the affected areas should also be invited to share updates and ground level information. This meeting can be organized in the affected areas (such as Block office) if required and feasible.	Officer-in-charge of EOC

TIME FRAME : 0 + 1 HOUR		
24.	Establish onsite Emergency Operation Center	EOC
25.	Activate the emergency response as per the level of the disaster. ➢ In case of disaster upto block level, the BDO takes charge of the emergency response coordination along with the DMTs, QRTs, FRTs and ESFs. ➢ The BDO shall stay in regular communication with the DDMA and EOC for information updates and response actions. ➢ In case of disaster upto district level, a senior officer of ADM rank shall be given responsibility of emergency response coordination. He/she shall coordinate with the EOC, DMTs, QRT, FRT, ESFs etc.	DDMA Chair
26.	Activate the search and rescue teams in the affected areas with immediate effect.	EOC
27.	If required, ask for external support from armed forces, other technical institutions for reach, rescue and evacuation operations.	DDMA
28.	Collate and analyse the available initial information on damage and needs.	EOC
29.	Ask District-IAG to share their assessment information with EOC.	EOC

Sr. No.	Key Actions	Responsibilities
TIME FRAME : 0 + 3 HOUR		
30.	Senior ADM level officer to be deputed to the affected areas	DDMA
31.	Assess the condition of roads, rail route for quick mobilization of emergency teams and resources to the affected areas and take follow up	Transport dept., EOC
32.	Establis media management/information cell for public information, guidance to volunteers and aid agencies and for rumour control	EOC, Information and Public relation dept
33.	Contact District IAG, public and private sector agencies etc. to assist in emergency rescue and relief operations.	DDMA
34.	If required, seek assistance from neighbouring districts and state level.	DDMA
35.	Provide security in affected areas and maintain law and order situation	Police dept
36.	Mobilize medical response teams with orthopaedic experts, first aid, cuts, wounds etc. to the affected areas.	Health dept
37.	Mobilize SAR teams and equipments etc. to the affected areas.	EOC, DDMA
38.	Maintain constant communication with onsite EOC	EOC
39.	Alert all major hospitals to make necessary arrangements for treatment of injured	DDMA, EOC

TIME FRAME : 0 + 12 HOUR		
40.	Open access routes and manage traffic for mobilization of equipment, machinery and volunteers to the affected areas	Transport dept
41.	Establish information centers at arrival and departure points viz. Railways station, bus stops etc.	DDMA
42.	Mobilize relief materials i.e. tents, food materials, water, essential medicines, blankets etc. to the affected areas.	Revenue dept
43.	Arrange to shift evacuated persons to temporary shelters and ensure provision of food, water & sanitation facilities, blankets, storage of relief materials etc.	Revenue dept
44.	Set up field hospitals near the affected areas.	Health dept
45.	Arrange to shift injured people to field hospitals.	Health dept
TIME FRAME : 0 + 24 HOUR		
46.	Develop situation report of the affected areas and share with all stakeholders. This should also be updated on the DDMA website promptly to ensure its availability to other stakeholders.	EOC
47.	Prepare press note twice a day with details of situation and response being made.	EOC

Sr.No.	Key Actions	Responsibilities
TIME FRAME : 0 + 24 HOUR		
48.	Depute additional officers and supporting staff to affected areas from non affected areas	DDMA
49.	Restore essential services i.e. power, water supply, telecommunication facilities of the EOC, HQ, AIR, Doordarshan, offices of key line departments, SP, Hospitals etc. on priority basis.	PHED, BSNL, Energy dept.
TIME FRAME : 0 + 48 HOUR		
50.	Plan for a multi sectoral damage and needs assessment of the affected areas. The assessment team may comprise of various ESFs and members from IAG to have a multi-agency, multi-sectoral	EOC
51.	Publish the assessment reports and other relevant information on the DDMA website.	EOC
52.	Arrange for identification, photograph, post mortem, and record maintenance for disposal of dead bodies (Refer NDMA guideline on	Police dept., Health dept.
53.	Set-up an information center near the relief shelters for community, relatives, NGOs etc.	EOC, Information and Public relation dept

54.	Arrange system to receive reports and complaints regarding missing people and other such losses and	EOC
TIME FRAME : 0 + 72 HOUR		
55.	Arrange for disposal of unidentified and unclaimed dead bodies	Police dept., Health dept.
56.	Arrange for transportation of injured people from local hospitals to district hospitals or to other	Transport, Health dept
57.	Initiate relief distribution and recovery actions (refer "Actions Common to All Disasters")	Revenue dept

Chapter 7

7.1 Mainstreaming of Disaster Management

India is growing at the rapid pace, be it urbanization or Industrial expansion. Maharashtra being one of the largest contributors in GDP is growing day by day with some of its largest cities population and Industrial area got almost getting doubled in decade. As the new developments such as urbanization, population and industries increases, it creates a new range of risk for the communities and social environment. There are many examples driven for economic growth and social improvement generating new disaster risks. Rapid and unplanned urbanization is an example. The growth of informal settlements and inner city slums, fuelled by internal migration from smaller urban settlements or the countryside, has led to the growth of unstable living environments. At the same time Industrial developments within the urban cities and town has led threats to the human population from fire, biological, radiation and nuclear hazards related risk for communities. This has led the government to integrate disasters risk reduction measures with development. The DM act mandates us to take measures for prevention/mitigation of disasters and to ensure that appropriate preparedness measures for integration of disaster management into development plans and projects are taken and further allocation of funds for prevention, mitigation, preparedness for disaster and capacity building are also made available. Since disaster management is not a function of DM department alone but of all departments hence mitigation concern must be addressed by the respective departments in all aspects of developmental plans and project.

7.2 Concept of Disaster and Development

Disaster and Development goes parallel to each other. Development and disaster have both positive and negative correlation. Development can increase the vulnerability of people and assets if DRR measures are ignored. One of crucial example is building a skyscraper without soil testing and land use planning. At the same time if the developmental activities will be done taking into consideration of various hazards in districts can reduce the physical exposure to hazards for example flood protection measures at the affected sites , earthquake resistant structure. Developments can reduce vulnerability if proper measures are taken into consideration while if ignored can set wiping out and setting back years of efforts on development. On the other hand it provides opportunities in the form of sustainable recovery.

7.3 Development Planning in Disaster Risk Reduction

Natural Disaster and human induced disaster is increasing day by day, looking at the frequency of various disaster in the district, disaster risk management should be put on the fore front of the development planning. The development plans and policies should comply with sustainable developments goals agenda, where the development programmes and project need to be review with the potential of every project to reduce the vulnerability and associated hazards. At the same time disaster preparedness and responsive measure should be designed along side of development plans which should focus on the reducing the vulnerability accumulated due to past developmental processes.

7.4 Legal Mandate

The Disaster Management Act, 2005 mandates District Disaster Management authority ""lay down guidelines to be followed by the departments of the Government of the State and on the same line at different departments in district for the purposes of integration of measures for prevention of disasters and mitigation in their development plans and projects and provide necessary technical assistance therefore" and to "review the development plans of the different departments of the State and ensure that prevention and mitigation measures are integrated therein". Under Section 38 (2) (e) of the Act the State Government is to ensure that the integration of measures for prevention of disaster or mitigation have been incorporated by the departments of the Government of the State in their development plans and projects. The State Government is further to ensure integration of measures to reduce or mitigate the vulnerability of different parts of the State to different disasters in the state development plan {38 (2) (f}.

The Act also prescribes for preparation of District Plan and for incorporation of measures suggesting as to how mitigation shall be integrated into development plans and projects. The Act states that the DMPs shall prescribe "the manner in which the mitigation measures shall be integrated with the development plans and projects". The DMPs of departments at State and district level shall also have provisions for prevention of disaster and mitigation of its effects or both in the development plans and programmes as provided for in the State DMP and as is assigned to the department or agency concerned.

7.5 Environmental Regulations

Environmental and social surrounding is being severely affected by increased infrastructural development and Industrial development in the district. Environmental hazards create serious implication for the human beings and living creature. According to Environmental Protection act 1986, 2 (a) environments include water, air and Land and the interlinking between and among the air, water. Land, human being and other creatures , plant

and micro organism and property. It mandates concern concerned departments such as Central Pollution Control Board and directed it as per the DM act as it supersedes environmental protection act am mandates to lay down standard measures for quality of air, water or soil for various areas and purposes. It mandates to allow maximum limits of concentration of various environmental pollutants including the procedures and safeguards for the handling of hazardous substances. Prohibition and restrictions on the handling of hazardous substances in different areas, prohibition and restriction on the location of industries and the carrying on process and operations in different areas. It mandates to takes procedures and safeguards for the prevention of accidents which may cause environmental pollution and for providing for remedial measures for such accidents, noise for differ. No person carrying on any industry, operation or process shall discharge any environmental pollutants in excess of standards prescribed by the section (7) environmental protection ac, 1986.District Disaster Management Authority in co-ordination with concern department should implement the project related for the control of the environmental pollution and should take necessary measures to curb the pollution to past activities .MIDC and Industrials sites to be audited every year with extent of effluents and pollutants discharge by the different Industries and the concern department should check the nature of impact made by the effluents on the communities and environments. The developmental projects need to be made as per guidelines of environment and need to be sanctioned by National Green Tribunal. Necessary arrangements to be made as per the environments act for the treatment of affluent and procedural safeguards to be made compulsory as per section (8) of Environmental protection act, 1986.

7.6 Good Practices

7.7 Common Effluent Pollution Treatment

Maharashtra Pollution Control Board has initiated Common Effluent Treatment Plant (CEPT) at Butibori, Pune,Thane, Raigad and Aurangabad. Common effluent treatment plant (CETP) not only helps the industries in easier control of pollution, but also act as a step towards cleaner environment and service to the society at large. Small scale industries, by their very nature of job cannot benefit much from economies of scale and therefore the burden of installing pollution-control equipment, falls heavy on them. Realizing this practical problem, under the policy statement for abatement of pollution the Govt. felt to extend the scheme for promoting combined facilities for treatment of effluent and management of solid waste for clusters of small scale industrial units and also to provide technical support to them. There is need to increase the CEPT plants at all the industrial clusters in the Nagpur region, thus helping in curbing water and air pollution due to affluent generated by industries.

7.8 State Water Monitoring Network

Maharashtra State Pollution control Board has initiated a project of state water Monitoring Network at various location such at Nagpur, Chandrapur ,Amravati , Nasik , Mumbai ,Pune. It mandates the district should comply with state authority network which regulates the monitoring of water network and quality of water, level of the different content in the waters and level of affluent discharge by the different industrial units. District should look into the monitoring system of all the lakes, reserves, and rivers in order to maintain quality of water level in the district.

7.9 Mainstreaming in Construction Practices

Urban Planning, PWD and town planning departments of the district is mandated to work as per the National Building Code, 2005.It is instrument to provide guidelines for regulating the building construction activities across the country. It serves as a Model Code for adoption by all agencies involved in building construction works to be done by Public Works Departments, other government construction departments, local bodies or private construction agencies. The Code mainly contains administrative regulations, development control rules and general building requirements; fire safety requirements; stipulations regarding materials, structural design and construction (including safety) and building and plumbing services..Under this the concern department should follow the measures in order to strengthen the building falling under different zones, the building areas which are closer to the back waters of dams and in the low lying areas of the need to be shifted and all the construction need to be made and sanctioned as per the guidelines of the National Building Code, 2005.

7.10 Approaches for Mainstreaming

There are three suggested approaches of mainstreaming disaster management into the development process and disaster management plans-

1. Structural Measures
    - Re-enforcing building permit process.
    - Fire safety (in the residential as well as market area)
    - Structural évaluation of public infrastructure (Govt, Buildings, bridges, roads)
    - Reigning forcing and création of sewgage system in order to reduce Urban flooding.

2. Non Structural Measures
    - Situation analysis- figuring out the hotspots and vulnerable population in the city as well as district periphery by all the departments.
    - Improving access to information about disaster risk reduction at district and local level.
    - Strengthening capacities of communities at city level through awareness about various programme in normal times and at the time of disasters.

- Zonation of the various hazard, likelihoodness of its occurance, cylicity and population which may affacted due to various hazrads.
- Training and awraeness programmes need to be provided to the governmnet official.

3. Disaster mitigation Projects
   - Drought Prone Area Development Plan: Programmes like drought Drought Prone Area Developments need to be inducted into the villages of the district which are concurrently falling under the drought prone category.
   - Flood Risk Mitigation scheme: Programmes like flood risk mitigation scheme need to be introduced in the villages concurrently coming under the flood red zone in the Nagpur District and oher regions. The Scheme covers activities like a) Pilot Projects for development of model Multi-Purpose Flood Shelters and b) Development of River Basin specific Flood Early Warning System and Digital Elevation Maps for preparation of Inundation Models for giving early warning to the villagers for evacuation in case of flood.

Based on the suggested approaches the specific action would involve:-

- Adopting a Sectoral approach and identification of Key sectors for mainstreaming. within each sector, key programmes/projects would have to be identified an .This has to be followed by indentifying the entry points within the programmes/projects for integration.
- DRR measures should also be involved at the policy and planning level be it national, state and district level and the process of integration of DRR should be clear at al levels.
- It would also need a close coordination with State Planning Commission and Finance Department for promoting DRR into all development programmmes and involve working with different departments to mainstream DRR into the Departmental Plans and policies.
- Advocacy would have to be done for allocation of dedicated budget for DRR within the Departmental plans.
- Further appropriate guidelines for different sectors would have to be development and for it to be effective and sustainable it has DRR would have to be ultimately integrated to the development plans of various departments at the district and sub-district levels.

All the flagship programmes of government of Maharashtra and Central government funded programmes and projects should be initially integrated at the planning level with the Disaster reduction measures. This process of integration and implementation should be clear at all the levels of administration, government officials need to be trained and guided

specifically for the steps to be taken in all the developmental programmes initiated by the different department of the government. Some of the programmes of government initiated by the government of Maharashtra and centrally funded are given below.

7.11 Integrating DRR in departments

Integrating DRR with the development plays a vital role, thus each department must have their own role in formulating and implementing the DM plan. SEC shall ensure the mainstreaming of DRR in the developmental agenda of all existing and new developmental programmes and projects that shall incorporate disaster resilient specification in designs and construction. And accordingly the inspection and monitoring of these structural implementations should be done to ensure the safety and enhancing the disaster reduction. Risk and impact assessment projects should be followed to ensure the better environmental policies and to mitigate the disasters.

7.12 Approaches in Developmental Schemes

Pradhan Mantri Awas Yojana

- Construction of eco friendly houses for financially weaker section of the society.
- Conversion of kutcha houses into pucca or semi pucca houses.
- Use of flexi fund to incorporate risk reduction features.
- Coordinate with the other governmental schemes like Nirmal Bharat Abhiyan and rural water programme to ensure necessary aminities.

Deendayal Upadhay Swamyam Yojan

- Educational Scheme for tribal students.
- Upliftment of education in the rural areas.
- Flexi- fund for the education of children between 6years to 14years.

Punjabrao Deshmukh Scheme

- Residental assistance for the students.
- Financial hep the tribals of the state.
- Coordinate with the other governmental health schemes like ICDS, NRHM.

Sarva Shiksha Abhayan

- Upliftment of education.
- Free eduaction for the single girl child till class 12.
- 10 percent of flexi- fund in planning the activities undertaken to strengthen DRR and CCA.

Mahatma Jyotba Phule Jan Arogya Yojana (MJPYAY)

- Provide medical assistance to weaker section.
- Provide free medicines accoding to the cards available to them.
- Health Insurance (Rajiv Gandhi Jeevandayee Arogyee Yojana.
- Bal Thackeray Upgath Vima Yojana.
- Financial assistance for the treatment of the accident vicitms.

Krishi Gurukul Yojana

- Educate farmers with the new technique agriculture and floriculture.
- Promote climate resilient farming.

Pandit Deen Dayal UpadhyayKrishi Margadarshak Yojana

- Empower farmers in the overall growth of agriculture.
- Promotes for soil fertility tests.
- Promotes study on change in weather pattern.

Palakmantri Earth Moving Machine Kharedi Yojana and Palakmantri Panand Rashte Yojana

- Provide training to the rural youth for employment and their livelihood.
- Aims to promote rural economy.
- Link them with different governmental projects accordingly.
- Provides loans from the nationalized banks to buy machinery.

Mahatma Gandhi National Rural Employment Guarantee Act

- Promote employment to the weaker section of the society.
- Strengthen the list of developmental activities according to DRR and CCA.
- Enhance the number of working days in case of disasters like droughts.

Pradhan Mantri Gram Sadak Yojana

- Identify habitations that tends to get cut off during heavy rains as a part of village HRVA to priorities build connectioning roads to such habitates.
- National drinking water program.

National health Mission

- Should promote to increase the social developmental indicators.
- Community level health worker should be trained in DRR and CCA.
- Hazard resistant structures should be adopted in construction of new hospitals.

Integrated Watershed Management Programme

- Undertaken DRR project in drought prone areas.
- Ensure clean drinking water in the area.

National Rural Drinking Water Programme

- Access to drinking water in the rural areas.

- Undertaken project to ensure connectivity of wells in the villages.
- Total Sanitation Campaign.

Annexure:-

Table 1.1 Emergency Contact Numbers:-

Revenue Department					
Sr.No.	***Name***	***Designation***	***STD Code***	***Office***	***Mobile No.***
1	Shri. M. Devender Singh	District Collector, Beed	02442	222201	9168503666
2	Shri. B.M. Kamble	Addl. Collector, Beed	02442	222273	9860889956 8208491636
3	Shri. B.M. Kamble	Addl. Collector, Ambejogai (Addl. Charge)	02446	244901	9860889956 8208491636
4	Shri. C. V. Suryawanshi	Resident Deputy Collector, Beed	02442	222604	9422612394
5	---	Deputy Collector, GAD	---	---	---
6	Shri. Ganesh Nirhali	Deputy Collector, Election (Addl. Charge)	02442	222185	9422295175
7	Shri. Vikas Mane	S.D.O., Beed	02442	222458	8275516018
8	Shri. Ganesh Nirhali	S.D.O., Patoda	02444	242329	9422295175
10	Shri. Shivkumar Swami	S.D.O. Ambejogai	02446	247075	9423777565
11	Shri. Ganesh Mahadik	S.D.O. Parli	02446	226330	9823944767
12	Smt. Priyanka Pawar	S.D.O. Majalgaon	---	---	7738539264
13	Shri. Mahendra Kumar Kamble	Deputy Collector, EGS, Beed	02442	222849	9960425870
14	---	District Suppy Officer	02442	222319	---
15	Shri. C. V. Suryawanshi	L.A.O. Minor Irrigation, Beed (Addl. Charge)	---	---	9422612394
16	Shri. Vikas Mane	L.A.O. J.D. Beed. (Addl. Charge)	02442	229210	8275516018
17	Shri. Vikas Mane	L.A.O. Coordinate (Addl. Charge)	02442	224310	8275516018
18	Shri. Shivkumar Swami	L.A.O. J.D. 4, HQ. Ambejogai (Addl. Charge)	02446	248457 247080	9423777565
19	Shri. Balaji Agawane	District Planning Officer, Beed.	02442	222234	9422472834
20	Smt. Manisha Telbhate	Tahsildar G.A.D.	02442	222410	9422472834 9921910917
21	Smt. Manisha Telbhate	Tahsildar (Revenue)	02442	222604	9422472834 9921910917
22	Shri. Avinash Shingte	Tahsildar, Beed.	---	---	9881912019
23	Shri. Sanjay Pawar	Tahsildar, Gevrai	02447	262041	7875793939
24	Smt. Vandana Nikumbh	Tahsildar, Wadvani	02443	257503	8698817467
25	Smt. Rupa Chitrak	Tahsildar, Patoda	02444	242521	9890069618
26	Shri. N.G. Zampalwad	Tahsildar, Majalgaon	02443	234052	7588397777
27	Shri. Rameshwar Gore	Tahsildar, Ashti	02441	282542 232547	9890129029
28	Shri. Avinash Kamble	Tahsildar, Kaij	02445	252244 252252	9422370239 9545333234
29	Shri. Rajabhau Kadam	Tahsildar, Dharur	02445	274186 244206	9922842001
30	Shri. Sharad Zadke	Tahsildar, Parli	02446	222830 222730	9403689595
31	Shri. Santosh Ruikar	Tahsiladar, Ambejogai	02446	247084	7219088930
32	Shri. Balaji Shevale	Tahsildar, Shirur	02444	204117	9623747484
33	Shri. Sunil Deshmukh	Law Officer, Collector Office	---	---	9422742139
34	Shri. D.M. Sardeshmukh	Accounts Officer, Collector Office	---	---	9420229495
35	Shri. S. M. Gaikwad	Accounts Officer, Collector Office	---	---	9403082412
36	Shri. S. M. Limkar	P.A. to Collector	---	---	9422492875
37	Shri. Umesh Shirke	District Disaster Management Officer, Collector Office	---	---	7588092320
38	Shri. Pravin Chopde	District Informatics Officer, NIC	02442	223286 230744	9422240236

39	Shri. Sunil Khule	Asstt. D.I.O. NIC, Beed		02442	225456	9422743125
40	Shri. Mahesh Gole	E-District Project Manager		---	---	9860792551
National Disaster Response Force (NDRF), Pune						
41	Shri. Anupam Shrivastav	Commandant		02114	247010 Home: 231343	9423506765
42	Shri. A. K. Tiwari	2nd Commandant		02114	247010	9423578446
43	Shri. Bijendra Kumar	2nd Commandant		02114	247010	9422010448
44	Shri. Sachchidanand Gwade	Deputy Commandant		02114	247010	9422010443
45	Shri. Pandit Ithape	Deputy Commandant		02114	247010	9422315492
ARMY Ahmednagar Cantonment						
Sr.No.	***Name***	***Designation***	***STD Code***	***Office***	***Home***	***Mobile No.***
46	Shri. Vikrant Nayar	Brigadier	0241	2340320 Ext : 6390	2340320 Ext : 6391	9423677705
47	Shri. H. K. Sethi	Colonel	0241	2340320 Ext : 6324	2340320 Ext : 6325	9871240562
48	Shri. P. P. Singh	Major	0241	2340320 Ext : 6380	2340320 Ext : 6381	8007998410
49	Shri. Mohit Gharpure	Captain	0241	2340320 Ext : ---	2340320 Ext : ---	7387021085 7238832115
50	Shri. D. K. Pande	Subhedar	0241	2340320 Ext : 6378	2340320 Ext : 6379	8550954427
51	Shri. S. L. Patel	Subhedar	0241	2340320 Ext : 6378	2340320 Ext : 6379	7768827047
Zilla Parishad, Beed						
52	Shri. D.V. Nila	Chief Executive Officer, Beed (Addl. Charge)		02442	222323 222342	9422464421
53	Shri. D.V. Nila	Addl. Chief Executive Officer		02442	222225	9422464421
54	Smt. Sangita Patil	Project Director, DRDA & Accounts Officer (Addl. Charge)		02442	222697	8975977892
55	Shri. Dhanwantkumar Mali	Dy. C.E.O. GAD		02442	222342	9403321000
56	Shri. Udaykumar Solunkhe	Dy. C.E.O. Woman & Child Welfare		02442	222398	9421583979
57	Shri. Dr. Bhokre	Dy. C.E.O. Panchayat		02442	222297	9422840007
58	Shri. S. G. Kendre	Chief Accounts & Finance Officer		02442	222479	9822818972
59	Shri. Dr. Pawar	District Health Officer		02442	222374	9403724039
60	Shri. Ravindra Turukmare	District Social Welfare Officer		02442	223566	9423733702
61	Shri. D. B. Bitake	Agriculture Development Officer		02442	222378	9422219326
62	Shri. Swami	Executive Engineer, Construction 1		02442	222318	9422072981
63	Shri. S. K. Karanje	Executive Engineer, Construction 2		02442	222224	9822997662
64	Shri. S. R. Shinde	Executive Engineer, Minor Irrigation Dept.		02442	222456	9890174386
65	Shri. Khandare	Executive Engineer, Rural Water Supply (Addl. Charge)		02442	225482	9371644082
Education Officer, Zilla Parishad, Beed						
66	Shri. Sonwane	Education Officer, (Secondary)		02442	222324	9422658836
67	Shri. Rajnor	Education Officer, (Primary)		---	---	9422574335
68	Shri. Rajesh Gaikwad	Education Officer, (Continuous)		02442	222324	9423327888
Block Development Officer, Panchayat Samiti, Zilla Parishad, Beed						
69	Shri. Ravindra Turukmare	B.D.O. Beed		02442	222430	9423733702
70	Shri. P. S. Rajguru	B.D.O. Gevrai		02447	262024	7378615108
71	Shri. A. R. Sargar	B.D.O. Ashti		02441	282534	9422387033
72	Shri. Ganesh More	B.D.O. Patoda		02444	242529	9970763975
73	Shri. D. B. Giri	B.D.O. Ambejogai		02446	247026	8275453805
74	Smt. Nanda Gawali	B.D.O. Kaij		02445	252226	8275398356
75	Shri. S. N. Kendre	B.D.O. Parli Vaijanath		02446	223369	9422933531
76	Shri. Sonwane	B.D.O. Shirur Kasar		02444	259310	9158484638
77	Smt. M. S. KAmble	B.D.O. Dharur		02445	244204	7588179689
78	Shri. M. P. Pohre	B.D.O. Wadwani		02443	257677	9130136377

79	Shri. B.T. Chavan	B.D.O. Majalgaon	02443	234021	9423348756
80	Shri. S. P. Bhagwat	B.D.O. (MREGS) (Addl. Charge)	---	---	8983339665
Block Education Officer, Panchayat Samiti, Zilla Parishad, Beed					
81	Shri. Sayyed Azaz Ali	Beed	02442	222430	9420420947
82	Shri. N. M. Shinde	Gevrai	02447	262024	9175808497 8625688445
83	Shri. Prashant Shinde	Ashti	02441	242529	9423714150
84	Shri. V. D. Kulkarni	Dharur	02445	244204	7588596436
85	Shri. G. S. Bavane	Ambejogai	02446	247026	9423471483
86	Shri. P. D. Mahanubhav	Kaij	02445	252226	9890118499
87	Shri. G. M. Giri Shri. N. V. Munde	Parli Vaijanath	02446	223369	8888984577
88	Shri. B. D. Ghuge	Shirur Kasar	02444	259310	9657293373
89	Shri. R. S. Jaybhaye	Wadwani	02443	257677	9423288252
90	Smt. T. V. Andhare	Majalgaon	02443	234021	9545880088
Chief Officer, Municipal Council/Nagar Panchayat, District - Beed					
91	Shri. Milind Sawant	District Project/Administrative Officer, M.C. Admin., Beed.	---	---	9867410569
92	Shri. Dhananjay Jawalikar	Chief Officer, M.C. Beed	02442	222423 222636	7588547745
93	Shri. Rahul Sathe	Dy. Chief Officer, M.C. Beed	02442	222423 222636	9921787488
94	Shri. Ashish Lokare	Chief Officer, Ambejogai	02446	247104 247032	9673385050
95	Shri. Dr. B. D. Bikkad	Chief Officer, Parli	02446	222006 222012	9765931000 9423727212
96	Shri. Laxman Rathod	Chief Officer, Majalgaon (Addl. Charge)	02443	234240	9765395668
97	Shri. Bhagwat Bighot	Chief Officer, Gevrai	02447	262384 262015	8275324546
98	Shri. Vishal Bhosle	Chief Officer, Dharur	02445	274167	9422150888
99	Smt. Pushpagandha Bhagat	Chief Officer, Kaij	02445	251024	9881033533
100	Shri. Laxman Rathod	Chief Officer, Wadwani	02443	257503	9765395668
101	Smt. Manjusha Gurme	Chief Officer, Ashti	02441	282542	7588849617
102	Shri. Ram Kapare	Chief Officer, Shirur	02444	204117	9766773417
103	Smt. Neelam Kamble	Chief Officer, Patoda	02444	242521	8698553515
Important Officers in District - Beed					
104	Shri. D.V. Nila	Chief Executive Officer (Addl. Charge)	02442	222323 222342 222205 222329	9422464421
105	Shri. G. Shridhar	Superintendent Of Police, Beed	02442	222301 222302	8883006005 8983006005
106	Shri. Naikwade	Executive Engineer, P.W.D., Beed	02442	222474	9665917821
107	Dr. Ashok Thorat	District Civil Surgeon, Beed	02442	222618 222359	9527239000
108	Adv. A. D. Rakh	District Govt. Pleader, Beed	02442	222601 224209	9422240241
109	Shri. M.S. Pawar	District Jail Superintendent, Beed. (Addl Charge)	02442	222370	9422503435
110	Shri. G. Shridhar	District Commandant Homeguard, Beed (Addl Charge)	02442	229460	8883006005 8983006005
111	Smt. Vandana Thorat	District Information Officer, Beed	02442	222327 222229	9834337299
112	Shri. Shrirang Bhutada	District Treasury Officer, Beed	02442	222270 225395	9421355197
113	Shri. L. Galgunde	A.T.O. Treasury Office, Beed	02442	225395	9403789375
114	Shri. Sachin Madavi	Asstt. Commissioner, Social Welfare, Beed.	02442	222672	7720839155
115	Shri. Vijay Chavan	Lead Bank Officer, Beed	02442	222509	9923601654 9422369526
116	Shri. Borwal	Consumer Forum, Beed	02442	230501	7841822144
117	Shri. Ameen Sayyed	District WAKF Officer	---	---	8855925560

Other Important Officers in District - Beed					
118	Shri. A. R. Panhalkar	Divisional Controller, S.T., Beed	02442	222582 222505	7038803030 8999679756 9890298323
119	Shri. S. H. Karad	Depo Manager, S.T., Beed	02442	222316	9881446354
120	---	Bus Enquiry, Bus Stand, Beed	02442	222328	---
121	Shri. Dhananjay Jawalikar	Chief Officer, M.C., Beed	02442	222423 222636 222320	7588547745
122	Dr. S. B. Deshmukh	Dean, Govt. Medical College, Ambejogai.	02446	248438	9422240108
123	Shri. Sasane	Station Officer, Fire Dept., Beed	02442	222226	9730671949
124	Shri. Abhimanyu Kerure	Asstt. Commissioner, Food & Drug Administration, Beed	02442	222336	9969034272
125	Shri. S. T. Borkar	Asstt. Commissioner, Sales Tax, Beed	02442	223361	9987949377
126	Shri. Kamble	Inspector, Sales Tax Office, Beed	---	---	9822004434
127	Shri. J. V. Deshpande	Income Tax Officer Ward 1, Beed	02442	222413	7588181562
128	Shri. A. V. Wadgave	Income Tax Officer Ward 2, Beed	02442	222413	7588181617
129	Shri. N.K. Dharmik	Superintendent State Excise Dept., Beed	02442	222503	8600556454
130	Shri. Shaikh Salim	Deputy R.T.O., Beed (Addl. Charge)	---	---	9881195533
131	Shri. Patil	Deputy R.T.O. Ambejogai (Addl. Charge)	---	---	744726000
132	Smt. S. V. Misal	District Statistical Officer, Beed (Addl. Charge)	02442	222371	9421382598
133	Shri. A. A. Deshmukh	Govt. Labour Officer, Beed	02442	222653	9422243671
134	Shri. A. S. Bhate	General Manager, DIC, Beed (Addl. Charge)	02442	222285 225183	7264021975
135	Shri. K. N. Gutte	District Rural Industrial Officer (KHADI)	02442	222517	9421586812
136	Shri. P. B. Munde	Deputy Enginner, M.I.D.C., Beed	02442	227208	9921400091
137	Shri. Shaikh Abdul	M.I.D.C. Beed	02442	227208	9422295186
138	Shri. B. S. Tumbare	Asstt. Commissioner Fisheries	02442	222709	8600322411
139	Shri. Charthankar	Town Planner, Beed	02442	222529	8275905979
140	Shri. Tidke	Asstt. Town Planner, Beed	---	---	9422242328
141	Shri. Babe	District Deputy Registrar, Beed	02442	222321 222534	9922929729
142	Shri. B. D. Falke	Office Superintendent, D.D.R. Office, Beed	---	---	9423157860
143	Shri. P. K. Bhusare	Deputy Director, District Skill Development, Employment & Entrepreneurship Guidance Centre, Beed	02442	222348	9423469761
144	Shri. P. K. Bhusare	District Employment & Self Employment Guidance Officer, Beed.	---	---	9423469761
145	Shri. K. S. Andhale	District Malaria Officer, Beed	02442	222625	9975502742
146	Shri. K. S. Andhale	Deputy Director, Health Service Leprocy, Beed.	02442	233299	9975502742
147	Shri. K. K. Jaybhaye	General Manager, Milk Dairy Officer	02442	222565 222440	9420158465
148	Dr. Veer	Superintendent, Land Record, Beed	02442	222586	9881979292
149	Shri. P. G. Khomne	Joint District Registrar, Beed	02442	222708	9730065271

150	Shri. A. S. Deshmukh	Program Officer, Akashwani, Beed.	02442	222903 222904 222905	---
151	Smt. Ajay Pawar	District Sports Officer, Beed. (Addl. Charge)	02442	229092	---
152	Shri. Shivaji Kharat	Nehru Yuva Kendra, Beed	02442	222769	9422724427
153	Shri. Gajanan Funde	Tribal Project Development Officer, Aurnagabad	0240	2486069	9404950858
154	Shri. M.K. Mulla	Silk Development Officer, Grade 2, Beed	02442	221129	9890804058
155	Shri. M. A. Nikam	District Business Education Officer, Beed	02442	224348	9594075575
156	Shri. S.S. Jadhav	District Marketing Officer, Beed (New Mondha)	---	---	9822269598
157	Smt. S. K. Pandav	District Marketing Officer, Beed	02442	222408	9325710431
158	Shri. Munde	District Manager, Vasantrao Naik Corporation, Beed	02442	225570	---
159	Shri. S. R. Gutte	District Manager, Other Backward Class Development Corporation, Beed	02442	232624	9404347715
160	Shri. M. E. Kakad	District Manager, Mahatma Phule Backward Class Development Corporation, Beed	02442	222614	8446462525
161	Shri. Chandrakant Sathe	District Manager, Annabhau Sathe Corporation, Beed	02442	224916	8626034702
162	Shri. A. C. Girnare	Asstt. Controller, Legal Metrology, Beed	02442	222417	9423397224
163	Shri. Pravin Joshi	Regional Officer, Maharashtra Pollution Control Board, Aurangabad	0240	2473462	9423737150
164	Dr. Biradar	Field Officer, Beed (Maharashtra Pollution Control Board, Aurangabad)	---	---	90115160004
165	Shri. Paikrao	Asstt. Charity Commissioner, Beed	02442	222804	---
166	Shri. R. D. Kulkarni	District Woman & Child Welfare Officer, Beed	---	---	8805654414
167	Shri. P. S. Sable	Principal, Jawahar Navodya Vidyalaya, Gadhi, Tq. Gevrai	02447	269607	9850626932
168	Smt. Deshmukh	C.D.P.O., Ambejogai	---	---	8308593678
169	Dr. Lohkare	Principal Govt. Polytechnique College, Beed	02442	222609	8275460035
170	Shri. N. A. Nikam	Principal I.T.I. , Beed	02442	222448	9423049322
171	Shri. A. S. Rasal	Head Post Office, Beed	02442	222664	9405108775
172	Shri. Omprakash Giri	Child Labour Officer, Beed	02442	223303	9423171282
173	Captain Suresh Jadhav	District Sodlier Welfare Officer, Beed	02442	002105	9881723789
174	Shri. N. D. Kale	District Library Officer, Beed	02442	226435	9175925428
		Electrical Department Beed			
175	Shri. R. L. Sonwane	Superintendent Engineer, MAHADISCOM, Beed	02442	226279 226280 226281	7875762333
176	Shri. Ghodke	Executive Engineer, MAHADISCOM, Divisional Office, Beed	02442	002404	7875762009
177	Shri. K. A. Kulkarni	Executive Engineer, MAHADISCOM, Ambejogai	02442	247146	9960679303 7875762008
178	Shri. Choudhary	Chief Engineer, Thermal Power Station, Parli	02446	222026	8411971500
179	Shri. P. S. Vibhute	Executive Superintendent Engineer, Thermal Power Station, Parli	02446	222026	8975762397
180	Shri. Pravin Khurpe	Subordinate Engineer, Thermal Power Station, Parli	02446	222026	7588420224

		Telephone Exchange Beed			
181	Shri. Khan	General Manager, B.S.N.L. Beed (Addl. Charge)	02442	231700 231701	9422242520
182	Shri. D. R. Pokle	S.D.E. External Engineer	02442	230100	9422242518
183	Shri. Bhusekar	P. R. O. B.S.N.L. Beed.	02442	225944	9421336300 9423791791
184	Shri. Nilesh Dhawal	Complaint (Regarding Internet)	---	---	9421336300
185	Shri. Supekar	J.T.O. (Telephone Complaints)	02442	222550	9422931833
186	Shri. Maharudra Munde	J.T.O. (Telephone Complaints)	02442	222550	9403117333
187	Shri. Shelke	Telephone Connection			9422242521
188	Shri. Unde	B.S.N.L.			9422229722
189	Shri. Udawant	---	---	---	9421281599
190	Shri. Ganesh Bhanuse	---	---	---	9421155637
		Civil Hospital Beed			
191	Dr. Ashok Thorat	District Civil Surgeon, Beed	02442	222618 221598 228501	9527239000
192	Shri. Vishal Deshmukh	District Co-Ordinator, (N.R.H.M.)Zilla Parishad, Beed	02442	225910	9004954741
193	Dr. Sanjay Patil	Medical Officer, District Civil Hospital, Beed (Addl. Charge)	02442	222358	9423270465
		Police Officers Beed District			
194	Shri. G. Shreedhar (IPS)	Police Superintendent, Beed	02442	222301	8983006005
195	Shri. V. M. Kalubarme	Addl. Police Superintendent, Beed	02442	229460	9823914100
196	Shri. A. A. Borhade	Addl. Police Superintendent, Ambejogai.	02446	245133	9604436789
197	Shri. B. A. Sawant	Deputy Police Superintendent, Beed.	02442	225124	9821268200
198	Shri. B. G. Gade	Deputy Police Superintendent, Beed. (Economic Offence Wing)	---	---	9921525485
		Sub-Division Beed			
199	Shri. A. S. Khiradkar	Sub Divisional Police Officer, Beed.	02447	222208	9423145361
200	Shri. S. A. Sayyed	Police Inspector, Beed City	02442	222334	9168525999
201	Shri. S. R. Ballal	Asstt. Police Inspector, Beed Rural.	02442	222422	9823352177
202	Shri. N. V. Lakal	Police Inspector, Shivajinagar, Beed.	02442	233056	9823227216
203	Shri. P. A. Bade	Police Inspector, Pethbeed, Beed.	02442	223234	9545808100
204	Shri. G. B. Jadhav	Asstt. Police Inspector, Pimpalner, Beed	02442	254533	8605778355
		Sub-Division Gevrai			
205	Shri. A. N. Bhosle	Sub Divisional Police Officer, Gevrai.	02447	263133	8390026549
206	Shri. D. V. Aher	Police Inspector, Gevrai	02447	262100	9923421611
207	Shri. P. Y. Bangar	Asstt. Police Inspector, Talwada	02447	252013	9822533857
208	Shri. S. D. Gurme	Asstt. Police Inspector, Chaklamba.	02447	258033	9420437720
		Sub-Division Majalgaon			
209	Smt. B. B. Navtake	Sub Divisional Police Officer, Majalgaon	02443	224288	9665098309
210	Shri. A. R. Talekar	Police Inspector, Majalgaon City	02443	234120	9823498777
211	Shri. S. L. Pawar	Asstt. Police Inspector, Majalgaon Rural	02443	234033	9923102187
212	Shri. S. M. Rathod	Asstt. Police Inspector, Sirsala	02446	262433	9921632809
213	Shri. S. D. Magar	Asstt. Police Inspector, Wadwani	02443	257533	9552664300

214	Shri. A. M. Sayyed	Asstt. Police Inspector, Dindrud	02443	244533	9822944186
		Sub-Division Ambejogai			
215	Shri. V. A. Singuri	Sub Divisional Police Officer, Ambejogai.	02446	247078	9822244933
216	Shri. S. D. Gite	Police Inspector, Ambejogai City	02446	247100	9823152425
217	Shri. S. A. Hargabal	Police Inspector, Ambejogai Rural.	02446	248542	9822544771
218	Shri. H. M. Mankar	Police Inspector, Parli City	02446	222036	9823241587
219	Shri. H. G. Gawali	Police Inspector, Parli Rural	02446	222236	9764630100
220	Shri. U. M. Kasture	Asstt. Police Inspector, Sambhajinagar.	02446	223036	9923449305
221	Shri. S. D. Vispute	Asstt. Police Inspector, Bardapur	02446	271320	9967141031
		Sub-Division Kaij			
222	Shri. M. V. Naik	Sub Divisional Police Officer, Kaij	02445	251701	9423779953
223	Shri. S. D. Humbe	Police Inspector, Kaij	02445	252238	7741999939
224	Shri. S. H. Gandham	Police Inspector, Dharur	02445	274138	9822528444
225	Shri. G. A. Munde	Asstt. Police Inspector, Neknur	02442	250533	9921311920
226	Shri. R. P. Deshpande	Asstt. Police Inspector, Yusuf Wadgaon	02445	232504	9850985800
		Sub-Division Ashti			
227	Shri. A. S. Patil	Sub Divisional Police Officer, Ashti	02441	232503	9764455891
228	Shri. S. S. Sayyed	Police Inspector, Ashti	02441	282533	9923795601
229	Shri. D. M. Chavan	Police Inspector, Patoda	02444	242533	9422703093
230	Shri. S. S. Chate	Police Inspector, Shirur	02444	259539	8806774136
231	Shri. M. Baig	Asstt. Police Inspector, Ambhora	02441	281133	9764313999
232	Shri. V. D. Dhule	Asstt. Police Inspector, Amalner	02444	241533	9890831378
		Other Police Officers in Beed			
233	Shri. G. R. Palwade	Police Inspector, Local Crime Branch.	02442	227644	9422740494
234	Shri. Mane	Police Inspector, District Special Branch	02442	224860	9923130144
235	Shri. S. S. Budhwant	Police Inspector, City Traffic Branch	---	---	9823372950
236	Shri. S. G. Ubale	Police Inspector, Riot Control Team.	---	---	9881959287
		Beed District Central Co-Operative Bank			
237	Shri. Deshmukh	Managing Director	02442	222335	8275004713
238	Shri. Ubale	Administrative Officer	---	---	9511508555
239	Shri. Gaikwad	Accounts Officer	---	---	9011094712
240	Shri. Wakde	Clerk	---	---	9850164041
		Animal Husbandry Department			
241	Dr. Kende	Asstt. Commissioner, Animal Husbandry, Beed	02442	222092	9422244414
242	Dr. Mane	Deputy Commissioner, Animal Husbandry, Beed	02442	222813	9527707230
243	Dr. S. K. Tumbare	District Animal Husbandry Officer, Beed	02442	222392	7588541292
		Water Supply Department			
244	Shri. Meshraj	Senior Geologist	02442	222383	9420242522
245	Shri. P. S. Tumbare	Asstt. Senior Geologist, GSDA, Beed (Addl. Charge)	02442	222383	9423121371
246	Shri. M. B. Strote	Deputy Engineer, Mechanical Sub Division, GSDA, Beed	02442	222512	9421276938
247	Shri. S. V. Chavan	Executive Engineer, Rural Water Supply Department ZillaParishad, Beed	02442	225482	9422681224
248	Shri. R. G. Kanade	Executive Engineer, MJB	02442	222236 222237	9763715163

249	Shri. Antad	Deputy Engineer, Rural Water Supply Department	---	---	9970694510
250	Shri. S. B. Tandale	Deputy Engineer, Rural Water Supply Department	---	---	9158364788
251	Shri. Irshad	Deputy Engineer, Rural Water Supply Department	---	---	9970247790
		Public Work Department			
252	Shri. S. R. Katkade	Superintendent Engineer, PWD Circle, Osmanabad	02472	222884 227571	9422341601
253	Shri. P. G. Naikwade	Executive Engineer, PWD, Beed	02442	222474	9665917821
254	Shri. Dande	Dy. Executive Enginner, PWD, Beed	02442	222474	9822457444
255	Shri. Choure	Deputy Engineer, PWD, Beed (Addl. Charge)	02442	222474	9423714113
256	Shri. M. B. Shinde	Deputy Engineer, PWD, Majalgaon	---	---	9422497776
257	Shri. D. V. Vaidya	Sectional Engineer, PWD, Beed	02442	222474	9421960077
258	Shri. Jain	Sectional Engineer, PWD, Beed	02442	222474	9422244714
259	Shri. A. L. Rumne	Deputy Engineer, PWD, Beed	02442	222474	9923888236
260	Shri. Wagh Patil	Executive Engineer, PWD, Ambejogai	02446	247760	9967736555
261	Shri. M.R. Shende	Executive Engineer, Zilla Parishad Works 1, Beed (Addl. Charge)	02442	222318	9405522884
262	Shri. S. S. Ghubde	Executive Engineer, National Highway Dept. Beed	02442	224723	9823796111
263	Shri. Birajdar	Executive Engineer, Special Highway	---	---	9423709454
264	Shri. Borade	Deputy Engineer, Gevrai	---	---	9767098484
265	Shri. Patil	Deputy Engineer, Ashti	---	---	9421332112
266	Shri. Jilani	Deputy Engineer, Patoda	---	---	9422070333
267	Shri. Raut	Deputy Engineer, PMGSY	---	---	9922610022
268	Shri. Ghodke	PWD, Beed	---	---	7704090901
		Irrigation Department			
269	Shri. C. A. Birajdar	Executive Director, GMIDC, Aurangabad	0240	2342096	8554990385
270	Shri. R. B. Karpe	Executive Engineer, Jayakwadi Irrigation Dept. No.03, Beed.	02442	222881	9422185865
271	Shri. V. B. Galfade	Executive Engineer, Minor Irrigation (Water Conservation) Dept. Beed	02442	222520	9890084484
272	Shri. A. R. Jadhav	Addl. Executive Engineer, Beed Irrigation Dept, Beed.	02442	222351	9850798560
273	Shri. S. R. Shinde	Executive Engineer, Minor Irrigation, Zilla Parishad, Beed	02442	222456	9890174386
274	Shri. M. V. Kulkarni	Superintendent Engineer, Irrigation Project Circle, Parli	02446	222273	9423149962
275	Shri. D. H. Shinde	Executive Engineer, Majalgaon Irrigation Dept, Parli	02446	223136	9657271239
276	Smt. Sunanda Shinde	Superintendent Engineer, CADA, Beed	02442	222652	9423144198
277	Shri. S. S. Kharat	Superintendent Engineer, Minor Irrigation, Local level, Aurangabad Division, Aurangabad	0240	2331702	7030786417 9969276716
278	Smt. Megha Atkewar	Executive Engineer, Majalgaon Project Dept., Kesapuri Camp, Majalgaon	02443	234138	8888863394
279	Shri. V. D. Sarde	Mechanical Department	---	---	9730142209

Agriculture & Forest Department					
280	Shri. B. M. Misal	District Superintendent Agriculture Officer, Beed. (Addl. Charge)	02442	222686 222808	9403809639
281	Shri. B. M. Misal	Project Director, IWMP	02442	222686 222808	9403809639
282	Shri. Deshmukh	Deputy Director Agriculture, DSAO, Office, Beed	02442	222808	8378944857
283	Shri. A. K. Dhanapune	Deputy Director, Social Forestry, Beed	02442	222612	9921741931
284	Shri. Pawar	Asstt. Director, Social Forestry, Beed	---	---	7588954123
285	Shri. A. R. Satpute	Divisional Forest Officer, Beed	02442	222557 221595	8605968511
286	Shri. D. B. Bitke	Agriculture Development Officer, Zilla Parishad, Beed	02442	222378	9422219326
287	Shri. B. M. Gaikwad	Project Director, ATMA, Beed	02442	223610	9404963741
288	Shri. P. R. Chavan	Deputy Project Director, ATMA 1, Beed	02442	223610	9422714427
289	Shri. B. M. Gaikwad	Deputy Project Director, ATMA 2, Beed	02442	223610	9404963741