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# **District Disaster Management Plan (North Goa)**

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Goa Institute of Management  
Ribandar, Goa

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## **FOREWORD**

Goa though blessed by not being affected by any major disaster till date is still vulnerable to the natural calamities like Flood, Cyclonic Storms, Earthquake, Landslide, Mining hazards and Sea Erosion. Apart from these natural hazards there are chances of man-made disasters like major fire, industrial accidents, terrorist attacks etc.

Goa being a small state has 2 Districts namely North Goa and South Goa and it comprises of 11 Talukas. The total area of the state is 3700 Sq. km having a population 13, 43,998 with 50.23% living in rural areas and 49.7% of the population residing in urban areas.

The aim of this project is to formulate the District Disaster Management Plan, North Goa, in the context of Preparedness/ Mitigation, Incident Response System & Rehabilitation from natural disasters. This Plan should be useful to tackle the multi-hazard vulnerabilities to population buildings livestock crop area, industries, civil facilities and infrastructure and should be based on the factors like ever-growing population, the vast disparities of income, rapid urbanization, increasing industrialization, development within high risk zones, environmental degradation, climate change, state and national security, economy and sustainable development.

The objective of the District Disaster Management Plan, Goa is to facilitate execution of activities for prevention and preparedness, response operations, coordination, rehabilitation and community awareness and involvement.

In preparing the Plan, the existing manual has been studied; the prevailing documents and various stakeholders were consulted.

The framework of the plan is based on the paradigm shift in Disaster Management from a relief centric approach to a regime that anticipates the importance of preparedness, prevention and mitigation. The team has followed the guidelines for preparing District Disaster Management Plans and Incident Response System issued by the National Disaster Management Authority.

## **Acknowledgement**

We take this opportunity to thank the North Goa Collector, Mr. Mihir Vardhan for giving us the responsibility to update the District Disaster Management Plan-2012-13. Throughout the process his guidance, cooperation and suggestions helped us.

We also extend our thanks to Mr.Mahesh Corjuenkar, Dy.Collector (Revenue), North Goa for his whole hearted support at various stages of the preparation of this manual.

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## LIST OF ABBREVIATIONS

<b>S.No.</b>	<b>Abbreviation</b>	<b>Expanded form</b>
1.	ADM	Additional District Magistrate
2.	AIR	All India Radio
3.	BDO	Block Development Officer
4.	CAB	Civil Administration Branch
5.	CBO	Community Based Organisation
6.	CE-PWD	Chief Engineer- Public Works Department
7.	CE-WRD	Chief Engineer- Water Resource Department
8.	COP	Captain of Ports
9.	COs	Chief Officers
10.	CPMF	Central Para Military Forces
11.	CRs	Control Rooms
12.	DAHVS	Director Animal Husbandry and Veterinary Services
13.	DCR	District Control Room
14.	DCS	Director Civil Supplies
15.	DD	Doordarshan
16.	DDMA	District Disaster Management Authority
17.	DDMP	District Disaster Management Plan
18.	DHS	Director Health Services
19.	DIP	Director Information and Publicity
20.	Dir.	Director
21.	DM	District Magistrate

22.	DMA	Director Municipal Administration
23.	DMP	Disaster Management Plan
24.	EE	Executive Engineer
25.	FPS	Fair Price Shops
26.	GSDRS	Goa State Disaster Relief Scheme
27.	HMV	Heavy Motor Vehicle
28	IMD	Indian Metrological Department
29	LMV	Light Motor Vehicle
30	MDKTC	Managing Director Kadamba Transport Corporation
31	NCC	National Cadet Corps
32	NGO	Non-Governmental Organisation
33	NSS	National Social Service
34	NYK	Nehru Yuva Kendra
35	PCR	Police Control Room
36	POL	Petrol Oil Lubricants
37	PR	Public Relations
38	PRI	Panchayati Raj Institutions
39	RD	Rural Development

40	RTO	Road Transport Officer
41	S & R Operations	Search and Rescue Operations
42	SCR	State Control Room
43	SDM/SDO	Sub Divisional Magistrate/Sub Divisional Officer
44	SDMA	State Disaster Management Authority
45	SDPO	Sub Divisional Police Officer

46	SHG	Self Help Group
47	SOP	Standard Operating Procedure
48	SP	Superintendent of Police
49	STD	Standard Trunk Dialing
50	ULB	Urban Local Bodies
51	VHF	Very High Frequency
52	VP	Village Panchayat
53	ZAO	Zonal Agricultural Officer

## DEFINITIONS

For the sake of easy understanding, a few of the terms commonly used in dealing with natural disasters are defined here below:-

**Hazard<sup>1</sup>**: a threatening event, or the probability of occurrence of a potentially damaging phenomenon (e.g. an earthquake, a cyclonic storm or a large flood) within a given time period and area.

**Disaster<sup>1</sup>**: a serious disruption of the functioning of a society, causing widespread human, material, or environmental losses which exceed the ability of the affected society to cope using only its own resources. Disasters are often classified according to their speed of onset (sudden or slow) or according to their cause (natural or man-made).

**OR**

**Disaster<sup>2</sup>**: means a catastrophe, mishap, calamity or grave occurrence in any area, arising from natural or man made causes, or by accident or negligence which results in substantial loss of life or human suffering or damage to, and destruction of, property, or damage to, or degradation of, environment, and is of such a nature or magnitude as to be beyond the coping capacity of the community of the affected areas.

**Disaster Management<sup>2</sup>**: means a continuous and integrated process of planning, organizing, coordinating and implementing measures which are necessary or expedient for:

- i) prevention of danger or threat of any disaster;
- ii) mitigation or reduction of risk of any disaster or its severity or consequences;
- iii) capacity building;
- iv) preparedness to deal with any disaster;
- v) prompt response to any threatening disaster situation or disaster;
- vi) assessing the severity or magnitude of effects of any disaster;
- vii) evacuation, rescue and relief;
- viii) rehabilitation and reconstruction.

**Risk<sup>1</sup>**: the expected number of lives lost, persons injured, damage to property and disruption of economic activity due to a particular natural phenomenon, and consequently the product of specific risk and elements at risk.

**Vulnerability<sup>1</sup>**: the degree of loss to a given element at risk or set of such elements resulting from the occurrence of a natural phenomenon ( or man made event) of a given magnitude and expressed on a scale from 0.0 (no damage or loss) to 1.0 (total loss).

**Mitigation<sup>1</sup>**: measures taken in advance of a disaster aimed at decreasing or eliminating its impact on society and on environment.

**Mitigation<sup>2</sup>**: means measures aimed at reducing the risk, impact or effects of a disaster or threatening disaster situation.

**Preparedness<sup>1</sup>**: activities designed to minimize loss of life and damage, to organize the temporary removal of people and property from a threatened location and facilitate timely and effective rescue, relief and rehabilitation.

**Preparedness<sup>2</sup>**: means the state of readiness to deal with a threatening disaster situation or disaster and the effects thereof.

**Prevention<sup>1</sup>**: encompasses activities designed to provide permanent protection from disasters. It includes engineering and other physical protective measures, and also legislative measures controlling land use and urban planning.

## INTRODUCTION

### 1.1 WHAT IS A DISASTER?

**Disaster**, in very simple terms can be defined as *“A serious disruption of the functioning of a society, causing widespread human, material, or environmental losses which exceed the ability of the affected society to cope using its own resources.”* The United Nations has defined a disaster as “. . .

***the occurrence of a sudden or major misfortune which disrupts the basic fabric and normal functioning of a society (or community).***” It is an event or a series of events which results in loss of lives and/or damage or loss of property, infrastructure, essential services or means of livelihood on a scale that is beyond the normal capacity of the affected communities to cope with unaided.

Disaster is sometimes also used to describe a catastrophic situation in which the normal patterns of life has been disrupted and extraordinary emergency interventions are required to save and preserve human lives and the environment.

### **Risk**

Risk is a measure of the expected losses due to hazard event of a particular magnitude occurring in a given area over a specific time period. Risk is a function of the probability of particular occurrences and the losses each would cause. The level of risk varies with factors like nature of the hazard, vulnerability of elements which are affected and the economic value of those elements.

### **Hazards and Vulnerability:**

Hazards are often defined as *‘phenomena that pose a threat to people, structures or economic assets which may cause a disaster. They would be either man made or naturally occurring in our environment.’* (Disaster preparedness Training Manual, Philippine National Red Cross, 1994). A **natural hazard** pertains to natural phenomena which occur in proximity and pose a threat to people, structures and economic assets caused by Biological, Geological, Seismic, Hydrological or Meteorological conditions or processes in the natural environment. However, **Vulnerability** is defined as the extent to which a community, structure, service, or geographic area is likely to be damaged or disrupted by the impact of particular hazard on account of their particular nature, construction and **proximity to hazardous terrain or disaster prone area**. The concept of vulnerability therefore implies a measure of risk combined with the level of social and economic ability to cope with the resulting event in order to resist measure disruption or loss. It should be remembered that hazards by themselves are not disasters; they are threats that could trigger off disasters in vulnerable communities. Hence, a Disaster is a product of a **hazard** such as Earthquake, Flood or Cyclone coinciding with a **vulnerable situation**, which might include communities, cities or

villages. A disaster is caused when the hazard strikes a vulnerable area/asset. Without neither vulnerability nor hazard, there is no disaster. This relationship can be depicted in a simple equation:

$$\text{Disaster Risk} = \text{Hazard} + \text{Vulnerability}$$

Around 30 odd types of disasters have been identified and they are grouped into 5 broad categories:

1. Water and climate related disasters – drought, flood, cyclone, heavy rains, cloudburst, gale wind, whirlwind, tornado, hailstorm, lightening, Tsunami, heatwave etc.
2. Geologically related disasters – earthquakes, volcanoes, landslide etc.
3. Chemical, Industrial and Nuclear related disasters.
5. Accident related disasters like air crash, rail collision etc.
6. Biologically related disasters.

The following table illustrates the number of potential threats and the elements at risk during the disaster expected in this District:

HAZARD	WHAT IS AT RISK
Floods	Everything located in flood plans. Crops, livestock, machinery, equipments, infrastructure, weak buildings, their contents, people, local economy.
Earthquakes	Weak buildings, their occupants and contents, machinery, equipments, infrastructure, human lives.
Landslides	Anything located on or at the base of steep slopes or cliff tops, roads, infrastructure, buildings on shallow foundation, human lives, crops and vegetation.
Cyclones	Damage to the buildings, infrastructures, crops and vegetation, telecommunication / power lines, roads, etc.
Tsunami	Everything located in the coastal areas upto 500 mts -1 km belt.

## 1.2 THE DISASTER MANAGEMENT CYCLE:

There are three key stages of activity within Disaster Management

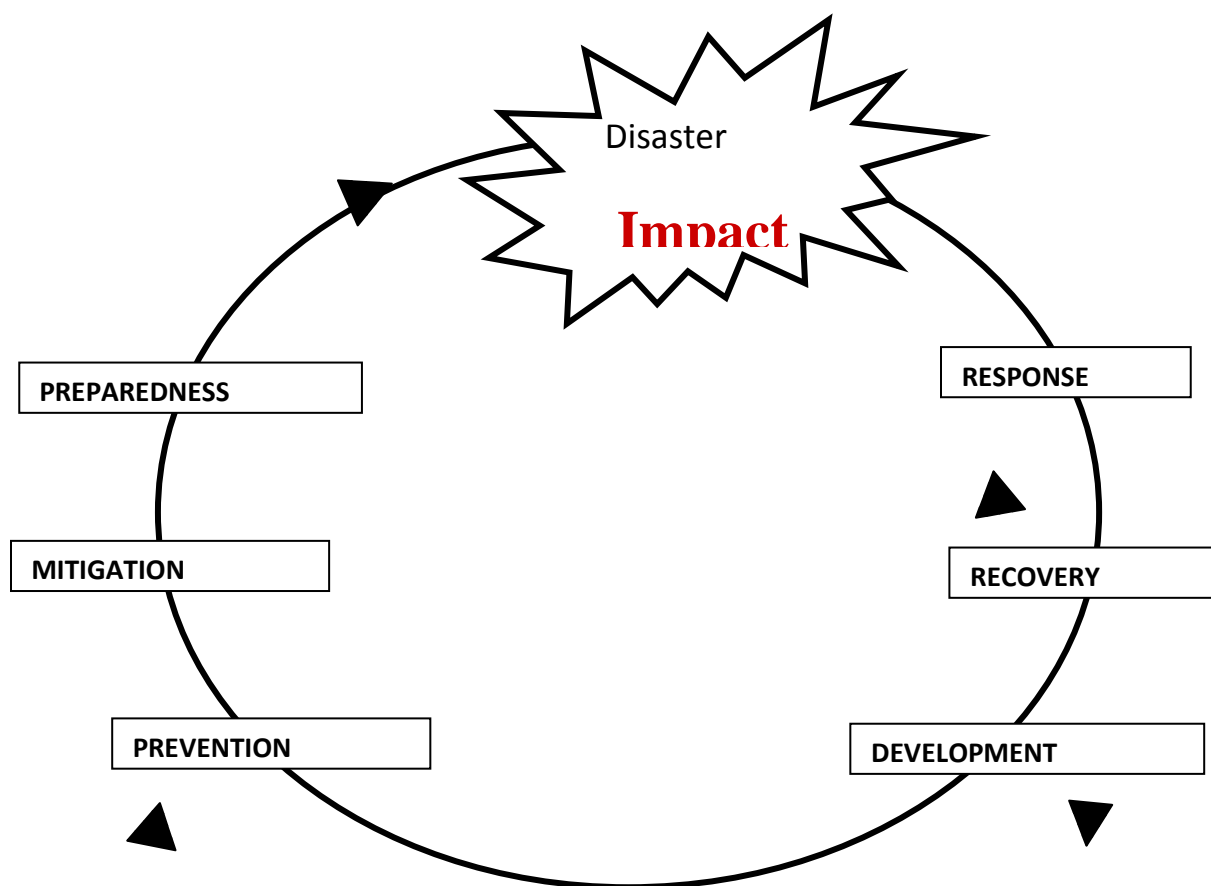
(i) **Pre-Disaster:** to reduce the potential for human, material or environmental losses caused by the hazards and to ensure these losses are minimized during disaster.

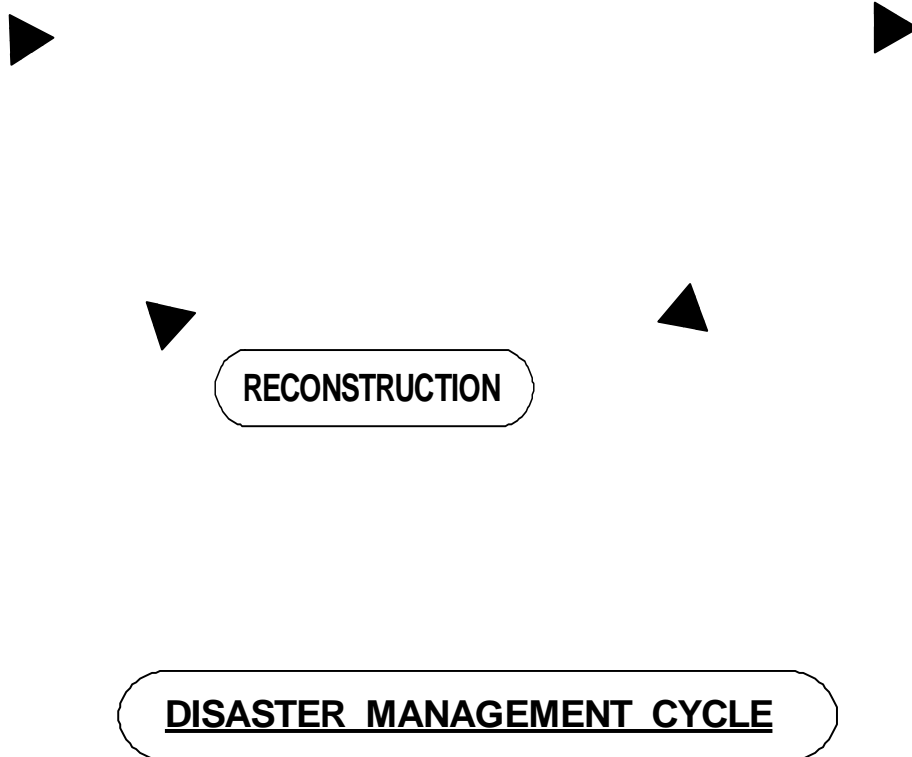
(ii) **During Disaster:** to ensure that the basic needs and provisions of the survivors like shelter, drinking water, food, clothing, medical requirements, sanitation facilities etc are met to alleviate and minimize the suffering.

(iii) **Post-Disaster:** to achieve rapid and durable recovery in a way that tries to ensure to the extent possible that the original vulnerable conditions are not reproduced.

The different phases of Disaster Management can be depicted lucidly as a

**Disaster Management Cycle** as shown below:-





The Disaster Management Cycle consists of the following broad stages:

i) **The Disaster event** : It implies the “real time” event of a hazard occurring and affecting the elements/communities at risk. The duration of the event will depend upon the type of threat as during an Earthquake, ground shaking may

occur for a matter of seconds, while flooding may take place over a longer sustained period.

ii) **Response and Relief** : This refers to the initial response of the administration and the community itself to a calamity and includes setting up of control room, dissemination of early-warning, evacuation, search and rescue operations, relief camp operations, medical aid to

needy, etc. Simultaneously, immediate relief needs to be provided to the homeless like food, drinking water, clothing, etc. and efforts are to be made for the restoration of communication, disbursement of assistance in cash or kind.

**iii) Recovery :** Recovery is used to describe the activities that encompass the three overlapping phases of emergency relief, rehabilitation and re-construction. Relief has been spelt out above while rehabilitation includes the provision of temporary public utilities and housing as interim measures. Reconstruction is the process for restoring the pre-disaster stage of normalcy in the functioning of the community and includes replacement of buildings, damaged infrastructure etc.

**iv) Development :** Development process is an ongoing activity. Long term prevention / disaster reduction measures like construction of embankments, increasing plant cover to reduce the occurrence of landslides, land use planning, construction of houses capable of withstanding the onslaught of heavy rains/wind/ Earthquakes are some of the activities that can be taken up as part of development plans.

**v) Prevention and Mitigation :** It involves activities which either reduce or modify the scale and intensity of the threat faced, thereby reducing the risk of disaster itself. Apart from undertaking physical measures for prevention and

mitigation, it is essential that steps should be taken to reduce the physical, economic and social vulnerability to the threats by analyzing and addressing the underlying causes like unequal land ownership, exploitative tenancy relations, skewed wealth creation and distribution etc.

**vi) Preparedness:** The all-important, all-encompassing phenomenon which embraces measures that enables Government, communities and individuals to respond rapidly to disaster situations to cope with them effectively.

Preparedness includes the formulation of viable emergency plan, development of warning systems, the maintenance of inventories and the training of personnel. All preparedness planning needs to be supported by appropriate Rules & Regulations with clear allocation of responsibilities and budgetary provisions.

### **1.3 OBJECTIVES AND PRIORITIES:**

Disaster Management can be divided into pre & post disaster contexts which can broadly be divided into 6 stages. Each stage grows out of the stage before it and leads to further action. The sequence as a whole can lead to effective reduction in the disaster risk. However, if disaster planning is restricted only to the formulation of a Disaster management Plan, then the full benefits are unlikely to accrue. These 6 stages are as follows:

#### **1 Inception of Disaster Planning;**

- Political commitment.
- Governmental structure with clearly defined authority and an appropriate budgetary commitment to maintain effective disaster planning.
  
- Up-to-date Preparedness plans, comprehensive in scope and operational at all levels.
  
- Mitigation plans to reduce the hazard threats and vulnerability to them.

**2 Risk assessment-** to balance known risks against available resources. It is a three part process that has to be undertaken in the following sequence-

- **Hazard Mapping:** Hazard Mapping is a process of establishing geographically the areas that are particularly susceptible to hazards.
- **Vulnerability Analysis:** This involves the process of estimating the vulnerability to potential disaster hazards of specified elements at risk. These include social, economic, natural, and physical environmental factors.
- **Resource Assessment:** When potential losses have been estimated, a further assessment is needed of the resources or “Capacities” existing to improve disaster planning.

**3 Defining levels of acceptable risks** - The information gathered through various processes of resource assessment is then analysed to enable a responsible course of action.

#### 4 **Preparedness and Mitigation Planning –**

- Through methods to reduce hazard impact e.g. building flood protective embankments or walls, creating and managing dam storage, community grain storage.
- Through preparedness measures that emphasise short term activities focused on the emergency period e.g. emergency regulation of water reservoirs in a drought situation.
- Through longer term mitigation measures aimed at the physical vulnerability, socio economic vulnerability and its underlying causes.

5 **Testing the Plan** – Through mock-drills/simulation exercises at all levels and involving all departments and the community at large.

6 **Feed-back** from lessons learned.

#### **1.4 DISASTER MANAGEMENT PLAN: NEED**

Disasters cause sudden disruption of the normal life of a community and cause damages to the life and property in a manner that the normal coping mechanisms are often found insufficient to handle the problem. In such cases, a well-coordinated and conceived administrative and community response plays a vital role in alleviating the sufferings of the people by providing prompt relief. To accomplish this task, the existence of a comprehensive and well-researched Disaster Management Plan is of critical importance. The officials and other actors involved in disaster response can rely on the instructions and checklists spelt out the Plan and proceed efficiently and quickly in disaster management. This has the effect of not only speeding up the rescue and relief operations, but also inspiring confidence in the affected people. The Disaster Management Plan can, like a shining beacon, effectively guide the entire machinery engaged in relief/rescue operation and other disaster response activities and instill confidence and faith in the community at large to face the calamity courageously in a systematized manner.

# SECTION – I: STRUCTURAL

## CHAPTER - I

### DISTRICT PROFILE

#### 1.1 LOCATION:

Goa, situated along Konkan coast of India, has a coastline of 131 kms. It has a party hilly terrain with the Western Ghats rising to nearly 1200 mtrs. in some parts of the state. In the North, the Terekhol River separates Goa and Maharashtra. Karnataka lies to the South. The Arabian Sea is situated on the west and the Western Ghats in the east. The Tiswadi Island lies between the Mandovi and Zuari rivers, which are connected on the landward side by a creek. The island is triangular in shape that divides the harbour of Goa into two parts - Aguada at the mouth of Mandovi on the North and Mormugao at mouth of Zuari on the South.

- ❖ Latitude: 14°53' 54" North to 15°48' 00" North.
- ❖ Longitude: 73°East to 75°East.

#### 1.2 AREA & ADMINISTRATIVE SET-UP:

1	Sub-divisions	:	5 Nos. (Panaji, Mapusa, Bicholim, Ponda and Pernem).
2	Talukas	:	6 Nos. (Bardez, Bicholim, Pernem, Ponda, Sattari and Tiswadi).
3	Villages	:	213
4	Gram Panchayats	:	121
5	Zilla Panchayat	:	1
6	Municipalities	:	4
7	Municipal Corporation	:	1

### 1.3 DEMOGRAPHY (According to 2001 Census):

- Total Population of State of Goa: 13,47,668
- Total Population of North Goa: 7,58,573 (56.29% of State)
- Male Population: 3,88,502
- Female Population: 3,70,071
- Density per Sq. Km: 382

State/ District/ Taluka	<u>Population</u>							
	<u>1991</u>				<u>2001</u>			
	Rural	Urban	Total	Decadal Growth (%)	Rural	Urban	Total	Decadal growth
Goa	690041	479752	1169793	+16.08	677091	670577	1347668	+15.21
North Goa	439200	225604	664804		416824	341749	758573	
Pernem	62111	4578	66689		62386	9613	71999	
Bardez	105068	84315	189383		94250	133445	227695	
Tiswadi	51418	95025	146443		55019	105072	160091	
Bicholim	64332	20200	84532		53647	37087	90734	
Sattari	42705	6825	49530		50696	7917	58613	
Ponda	113566	14661	128227		100826	48615	149441	

Source : Economic Survey 2004-05

❖ **Religion-wise Population of the district:**

State/District / Religion	Total Population			Population 0- 6 years		
	Persons	Males	Females	Persons	Males	Females
Goa	1347668	687248	660420	145968	75338	70630
NorthGoa	758573	388502	370071	80129	41356	38773
Hindus	576848	299037	277811	61022	31543	29479
Christians	136390	64913	71477	12174	6281	5893
Muslims	43383	23421	19962	6722	3411	3311
Others	1526	882	644	170	100	70
Religion Not Stated	426	249	177	41	21	20

Source: Economic Survey 2004-05

**1.4 LAND USE PATTERN 2006-07:**

S.No.	Item	Area In Hectares	Percentage To Total
1.	Total reporting area:	361113	100.00
2.	Area under Forest:	125473	34.75
3.	Land not available for cultivation:	37137	10.28
4.	Current fallow	6750	1.87
	<ul style="list-style-type: none"> <li>• Permanent pastures and other grazing land.</li> <li>• Land under misc tree crops and groves.</li> <li>• Cultivable waste including fallow land.</li> </ul>	221305  22580  2252829	220.36  220.16  2214.63
5.	Net area sown:	137039	37.95
6.	Area sown more than once	35069	9.71
7.	Gross cropped area.	172108	47.66
<i>Source: Economic Survey 2007-08</i>			

### 1.5 CLIMATIC INDICATORS:

- ◆ Temperature : Max. 35 deg.C.  
: Min. 17 deg. C.
- ◆ Humidity : 54%
- ◆ Dewpoint : 24oF/25oC
- ◆ Wind : SW at 4MPH/6 Km per hour.
- ◆ Average Rainfall : 2918.8 mm
- ◆ Rain Gauge Stations : Panaji, Mapusa, Pernem, Valpoi Ponda

❖ **☒ Rainfall in Goa:**

The normal annual rainfall of the state is 2750mm.the total rainfall during the calendar year 2011 was 3750.8mm,which is slightly less than the last year rainfall of 3786.7mm (Economic survey:2011-12)

**1.6 AGRICULTURE:**

Sr. No.	Crop	Unit	Production (2010-11)
			4
1	Rice	Tonnes	172489
2	Ragi	"	254
4	Pulses	"	7982
5	Groundnut	"	16812.24
6	Sugarcane	"	49108
7	Cashewnut	"	23138
8	Coconut	Million nuts	128.88
9	Arecanut	Tonnes	2818
10	Mango	"	9284
11	Banana	"	25006
12	Pineapple	"	4530
13	Vegetables	"	60472
14	Other Fruits	"	40850
	Oil Palm		2146
	Pepper		232

	Tree Spices		4
--	-------------	--	---

Source: Economic Survey 2011-12

## 1.7 FORESTS:

### ❖ Area under forests:

S. No.	Taluka	Area (in sq. km)
1	Tiswadi	1.71
2	Bardez	Nil
3	Pernem	13.43
4	Bicholim	8.08
5	Sattari	280.99
6	Ponda	50.12

### 1.8 INDUSTRIES:

Taluka	Units	Units	Employment
Tiswadi	1	76	700
Bardez	4	223	4500
Bicholim	1	85	1200
Sattari	2	39	900
Pernem	1	44	500
Ponda	4	363	7100
Mormugao	1	138	2200
Salcete	3	511	19000
Quepem	2	42	2000
Sanguem	1	1	146
Canacona	1	30	300
Total	21	1552	38546

Source: Economic Survey 2011-12

### 1.9 RIVER SYSTEMS AND RESERVOIRS:

- ◆ **Major Rivers in North Goa:**
  - o Terekhol River
  - o Chapora River
  - o Mandovi River

◆ **Tributaries of Mandovi River:**

- o Madei ११Kudne
- o Surla ११Valvant
- o Kotrachi ११Bicholim
- o Ragda ११Assonora
- o Khandepar ११Sinker

◆ **Minor River In North Goa:**

- o Baga River

◆ **River Carrying Capacity:**

There are no regular Gauge & Discharge Stations on rivers in North Goa. However, flood-level observations are made during monsoons on some rivers. Details of these observation stations are given below.

Sr. No.	Name of River/Stream	Location of Flood Observation Station	Warning Level, RL mts	Danger Level RL mts	High Flood Level RL mts
1	2	3	4	5	6
1	Madei	Ganjem village, Ponda taluka	9.500	10.500	12.520
2	Veluz	Valpoi, Sattari taluka	99.000	100.000	101.000
3	Gotoli nalla	Gotolli, Keri, Sattari taluka	99.000	100.000	102.000
4	Bicholim	Shantadurga School, Bicholim	4.300	5.200	6.200
5	Bicholim	Near Kadamba Bus stand, Bicholim	4.300	5.200	6.200
6	Valvonta	Sanquelim market, Sanquelim	2.900	4.400	8.200

7	Valvonta	Near Datta temple, Sanquelim	5.100	6.100	7.800
8	Kapileshwari nalla	Khadapabandh road culvert, Ponda	98.365	98.665	98.965

❖ **Major / Medium / Minor Reservoirs in North Goa.**

Sr.No.	Name	Full Reservoir Level, mt	Gross Storage Ha-m	Dead storage Ha-m	Live Storage Ha-m
1	2	3	4	5	6
	<b>Major Irrigation Project</b>				
1	Tillari Irrigation Project (Daris located in Maharashtra)				
	<b>Medium Irrigation Project</b>				
1	Anjuna Irrigation Project	93.200	4545.30	62.30	4483.0
	<b>Minor Irrigation Project</b>				
1	M.I. Tank at amthane in Bicholim taluka	50.025	525.12	16.12	509.0
2	M.I. Tank at Panchavadi in Ponda talukas	26.000	446.36	10.28	436.8

❖ **Irrigation Systems.**

S. No.	Name	Command in Ha	TalukaCovered
1	2	3	4
1	Tillari Irrigation Project.	16978	Bardez, Pernem, Bicholim
2	Anjunem Irrigation Project.	2100	Sattari Bicholim
3	M.I. Tankat Amthane in Bicholim talukas.	180	Bicholim
4	M.I. Tankat Panchawadi in Ponda talukas.	150	Ponda

### **1.10 TRANSPORTATION NETWORK:**

#### **❖ Roads:**

Sl.No.	Category	Length of Roads (In Km.)
1	Roads under PWD	5044.58
2	Roads under Municipalities	381.74
3	Roads under Panchayats	4724.17
4	Roads under Forest	74.137
	Total Roads	10224.63

Source: Economic Survey 2011-12

#### **❖ Railways:**

Location of railway Station/ Contact No.	Distance from Panaji (Kms)	Major Trains

Margao	2712790	35	Rajdhani Express Goa Express Mangala Express Mandovi Express Matsyagandha Express Janashatabdi Express to Mumbai/Mangalore)
Karmali	2285798	12	Mandovi Express
			Madgaon-Dadar Express
Thivim	2298682	18	Mangala Express
			Mandovi Express
			Matsyagandha Express
Pernem	2201283	28	Mandovi Express
			Matsyagandha Express

❖ **Airways:**  
o Airport:

- Dabolim (30 Kms from Panaji) (Ph No.2540806/0907)

o Airlines:

- Indian airlines : 2426363
- Air India : 2431100
- Kingfisher : 2542020
- Jet Airways : 2438792
- Go Air : 5652280
- Air Sahara : 2237346
- Air Deccan : 2438950

**1.11**

**COMMUNICATION:**

❖ TELEVISION

- Goa Doordarshan, Panaji :2223413
- Goa Newslite :5620572
- Goa 365 :3090335
- Goa Plus :2438270

❖ RADIO

- All India Radio, Panaji : 2225662

❖ DAILIES

- Gomantak Times
- Herald O
- Navhind Times
- Gomantak
- Tarun Bharat
- Goa Doot
- Sunaprant.

❖ **Telecommunications:**

- General manager, Sanchar Bhavan: 2437500.

## **CHAPTER – 2**

### **RISK ASSESSMENT AND VULNERABILITY ANALYSIS**

A combination and geographical factors like climate, geomorphology, drainage pattern, proximity to the open sea etc. render North Goa District prone to a variety of natural disasters like floods, cyclones, earthquakes, Tsunamis etc. As per the all India seismic categorisation, Goa falls in seismic zone IV that indicates that Goa has high probability for occurrence of earthquakes. A number of large and small river systems drain the district and the gradient and topography of the region combined with heavy monsoons and high tide conditions caused flooding and water logging in quite a few places in the District. The occurrence of cyclones / floods, however, is restricted to the monsoons only. The impact of cyclonic winds is felt towards the onset of the monsoons in April end and May and again towards the flag and around September/October.

## 2.1 ECONOMIC, OCCUPATIONAL, SOCIAL AND EDUCATIONAL

### PROFILE OF THE POPULATION.

#### (a) Economic Profile:

**GSDP at current and constant prices**

Year	GSDP (₹ in lakh)	
	Current	Constant
2006-07	1646674	1494087
2007-08	1934589	1578156
2008-09	2235802	1727403
2009-10	2588212	1952462
Compound Annual Growth Rate (2006-07 to 09-10)	16.27 %	9.33 %
Growth Rate in 2009-10	15.76 %	13.03 %

Source: Economic survey 2010-11

- Sectoral composition of GSDP at current prices (Per cent)

#### Sectoral composition of GSDP at current and constant prices

Years	Sectors		
	Primary	Secondary	Tertiary
2004-05	12.38	42.88	44.75
	<i>12.38</i>	<i>42.88</i>	<i>44.75</i>
2005-06	14.21	40.70	45.09
	<i>13.69</i>	<i>41.68</i>	<i>44.62</i>
2006-07	17.24	38.65	44.10
	<i>13.27</i>	<i>41.90</i>	<i>44.83</i>
2007-08	20.36	36.54	43.09
	<i>12.77</i>	<i>41.38</i>	<i>45.86</i>
2008-09	20.66	36.13	43.20
	<i>12.09</i>	<i>40.02</i>	<i>47.90</i>
2009-10	20.25	36.32	43.43
	<i>11.39</i>	<i>37.73</i>	<i>50.88</i>

Figures in italics are at constant prices

Source: Economic survey 2010-11

**(b) Population Profile: North Goa**

State/ Union Territory/ District	Population			Males			Females		
	Total	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban
GOA	1457723	551414	906309	740711	276121	464590	717012	275293	441719
NORTH GOA	817761	325041	492720	417536	164397	253139	400225	160644	239581
Census of India 2011 (Provisional Data)									

State/ Union Territory/ District	Child Population 0-6 Years (Persons)			Child Population 0-6 Years (Males)			Child Population 0-6 Years (Females)		
	Total	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban
GOA	139495	52321	87174	72669	27190	45479	66826	25131	41695
NORTH GOA	75117	29817	45300	39316	15573	23743	35801	14244	21557
Census of India 2011 (Provisional Data)									

State/ Union Territory/ District	Literates (Persons) 2011			Literates (Males) 2011			Literates (Females) 2011		
	Total	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban
GOA	1152117	420523	731594	620026	228295	391731	532091	192228	339863
NORTH GOA	659812	256195	403617	354660	138588	216072	305152	117607	187545
Census of India 2011 (Provisional Data)									

(c) Educational Profile:

- **Educational Institutes:**

S.No.	Level of Education	2004-2005	
		No. of Institutes	Enrollment
1	Primary	1,232	81,795
2	Middle	440	72,308
3	Secondary	372	63,760
4	Higher Secondary	81	23,820
5	University (General Education)	24	16,338
6	University Professional Education)	21	5,891
7	Technical and Professional	31	7,453
<b>Total</b>		2,201	2,71,365
<i>Source: Economic Survey 2005-06</i>			

- **Literacy Rates in North Goa District: (as per Census 2001)**

State/	Rural	Urban	Total
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<b>District/ Taluka</b>	<b>Total</b>	<b>Male</b>	<b>Female</b>	<b>Total</b>	<b>Male</b>	<b>Female</b>	<b>Total</b>	<b>Male</b>	<b>Female</b>
Goa	79.7	87.4	71.9	84.4	89.5	79.0	82.0	88.4	75.4
North Goa	82.0	89.9	73.8	85.4	90.2	80.3	83.5	90.0	76.7
Pernem	80.6	89.5	71.1	82.1	89.0	74.8	80.8	89.5	71.6
Bardez	86.6	92.1	81.2	84.8	89.1	80.2	85.5	90.3	80.6
Tiswadi	82.4	89.4	75.6	86.3	91.1	81.1	84.9	90.5	79.2
Bicholim	81.7	90.6	72.3	86.8	92.9	80.3	83.8	91.5	75.6
Satari	74.5	84.7	63.9	88.3	94.2	82.1	76.4	86.0	66.3
Ponda	82.0	90.6	73.0	84.7	89.2	79.7	82.9	90.1	75.1
<i>Source: Economic Survey 2007-08</i>									

- Literacy rate 1960 to 2001:

S.No.	Year	Literacy rate (Percent)		
		Male	Female	Total
1	1960	48.70	22.80	31.23
2	1971	54.65	35.79	45.31
3	1981	65.99	48.29	57.25
4	1991	83.64	67.09	75.51
5	2001	88.42	75.37	82.01

Source:- Economic Survey 2004-05

- Type of Structure of primary schools:

S.No.	Type of structure	No. of Schools		
		North Goa	South Goa	Goa
1	Pucca	605	409	1014
2	Partly Pucca	10	3	13
3	Kutchha	6	2	8
4	Tent	0	0	0
5	Open space	1	1	2
	<b>Total</b>	<b>622</b>	<b>415</b>	<b>1037</b>

Source:- Economic Survey 2004-05

- Infrastructure facilities of government primary school:

S. No.	Taluka / District / State	No. of schools functioning in		No. of schools without		
		Govt. premises	Private premises	Toilet	Water	Electricity
1	Pernem	74	2	52	21	1

2	Bardez	77	2	25	35	0
3	Tiswadi	42	11	8	4	2
4	Bicholim	79	4	48	37	8
5	Satari	98	1	73	54	20
6	Ponda	135	12	53	55	0
	North Goa	505	32	259	206	31
	South Goa	327	53	179	174	236
	Goa	832	85	438	380	267
Source: Directorate of Education, Government of Goa/ Economic Survey 2004-05.						

◆ Number of new vehicles on live register:

Sl. No.	<u>Year</u>	<u>No. of vehicles</u>
1	2010	727042
2	2011	790075
Source: Economic survey 2011-12		

◆ Number of driving licenses issued as on 31/12/2007:

Sl. No.	<u>Place of the Registering Authority</u>	<u>No. of driving licenses issued</u>
1	Mapusa	68443
2	Ponda	37544
3	Bicholim	35059
4	Panaji	93978
5	<b>Total</b>	<b>235024</b>
Source: Directorate of Transport, Govt. of Goa		

## 2.2 DISTRICT SPECIFIC PRONENESS TO VARIOUS TYPES OF DISASTERS:

### 1. Cyclone

#### History of Occurrence:

Type of Disaster	Date of occurrence	Loss of Life	Damage Caused
<b>Cyclone Phyan</b> hit coast of Maharashtra, Goa and Gujarat.	November 9-12, 2009	7 persons dead and 44 missing	the cyclone 'Phyan' caused damage to crops and properties in Goa

#### Vulnerable Regions in North Goa:

<b>Types of disaster</b>	<b>Potential Impact</b>	<b>Vulnerability</b>	<b>Vulnerable Areas (Talukas)</b>
Cyclone	<ol style="list-style-type: none"> <li>1. Loss human and bovine life.</li> <li>2. Damage to crops, infrastructure.</li> <li>3. Damage to houses, livelihood systems.</li> <li>4. Destruction of public property.</li> <li>5. Severe stress and Psychological disorders.</li> </ol>	<p><b>Communication Network:</b> Road network of the affected areas, Telephone connections.</p> <p><b>Private Infrastructures.</b> Kutcha Houses, Semi Kutcha Houses.</p> <p><b>Agriculture/ Horticulture.</b> Crops, plantations etc. <b>Irrigation Sources. Electrical Installations. Drinking Water Sources.</b> Tube-wells, Wells, <b>Educational Infrastructure.</b> Primary Schools, High Schools, Colleges.</p> <p><b>Live stock.</b> Cows, Buffalos, Goats/ Sheep, Poultry Farms,</p> <p><b>Vulnerable Groups.</b> Handicapped, Old / Aged, Pregnant women, lactating mothers, Sick and ailing diseased,</p>	Full of North Goa

		children below 5 years.	
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Additionally, both the areas along coastline and interior regions can be affected by gusty winds which can cause damage to property, damage to crops, collapse of trees and in turn threatening lives of people including fishermen, livestock, ships and barges, boats, ships, fishing trawlers at ports.

If cyclonic winds are accompanied by heavy rainfall then there is possibility of flooding in low lying areas, in Goa. Refer the 'Response Plan on Floods'.

Data on gusty winds and rainfall for past years is available with IMD office in Vile Parle, Mumbai. This information is available at a charge from the met department. Analysis can be done based on past data regarding gusty winds and the probable months when they may be caused, if this is made available to us. (Charges for data for 10 years is Rs. 48000/-)

## 2. Earthquakes

Goa falls in seismic zone IV that indicates that Goa has high probability for occurrence of earthquakes. Goa forms part of the moderate seismic zone in the country, namely, Zone IV of seismic zoning map of India. Though Goa has not directly witnessed any earthquake it was affected by tremors from devastating earthquakes from neighbouring state.

### History of Occurrence:

Type of Disaster	Year of occurrence	Damage Caused
the tremors of the devastating earthquakes with magnitude 5.0 or more that hit "Koyana" Maharashtra, that affected life of people in Goa	1967	Residential as well as public structures, infrastructures were damaged severely, although no casualties were taken place
the tremors of the devastating earthquakes with magnitude 5.0 or more that "Latur" in Maharashtra, that affected life of people in Goa	1993	Residential as well as public structures, infrastructures were damaged severely, although no casualties were taken place

## Earthquake Disaster Vulnerability of North Goa

### Vulnerability: Whole of North Goa District

Although the vulnerability is low, towns are more at risk than rural areas due to higher density of population. Another concern is the large numbers of building both private and public have been constructed without proper earthquake resistance features. Goa being a tourist location has a number of heritage sites (No. of listed heritage buildings is 431 as per Town and Country Planning Department Notification) that need to be made earthquake resistant.

### **3. Floods**

A number of large and small river systems drain the district and the gradient and topography of the region combined with heavy monsoons and high tide conditions caused flooding and water logging in quite a few places in the District. The occurrence of cyclones / floods, however, is restricted to the monsoons only. The impact of cyclonic winds is felt towards the onset of the monsoons in April end and May and again towards the flag and around September/October.

## **Rainfall history of Goa**

### **Heavy Precipitation**

- There was heavy precipitation in the catchment on Thursday i.e. 27.09.2007.
- The details of the intensity and duration of precipitation is being ascertained especially in the catchment in Maharashtra and Karnataka.
- Heavy precipitation is the most probable cause since heavy flood discharges were noticed after 8.00 p.m. from Viridi river and by 8.30 p.m. on 27<sup>th</sup> the river was flowing 1 mt above the Goteli Bridge.
- The state witnessed heavy rains accompanied by gusty winds on 26<sup>th</sup> June, 2010 night and 27<sup>th</sup> Morning, June, 2010 causing water logging and land slides in various places. The state Meteorological observatory recorded rain fall of 234.6mm during 24 hours ending early 27<sup>th</sup> June, 2010. (Navind Times 27.06.2010)

### **Effect of High Tides**

- The Valvanta River is prone to tidal variations upto Sanquelim Town.
- The heavy precipitation in conjunction with high tides results in afflux or rise in water level which leads to flooding.
- On 27<sup>th</sup> of September, the high tide which occurred at 11.30 p.m. was main factor in flood discharges overtopping the banks and embankment at Sanquelim

<b>Table 3.3.2 Rainfall in Goa Recorded from 1991 – 2008</b>			
<b>Year</b>	<b>In MM</b>	<b>Year</b>	<b>In MM</b>
1991	2152.3	1999	3680.4
1992	2778.2	2000	3511.6
1993	2558.3	2001	2128.1
1994	2894.4	2002	2270.4
1995	3555.6	2003	2686.9
1996	2880.9	2004	2156
1997	3366.9	2005	3345.1
1998	3078.9	2006	2109.6
		2007	3689
Source ; Goa Observatory, Panaji.			

### **History of Occurrence of floods North Goa:**

This District had not experienced by major floods in past few years, except in **2000 at Bicholim; 2005 at Mala, Panaji and Bicholim and in 2007 also in Bicholim** due to overflowing of rivulet, causing no major casualties but causing heavy damages to the properties.

As far as North Goa District is concerned, there are 3 main rivers viz. Terekhol, Chapora and Mandovi, besides one minor river Baga. The river Mandovi has 10 tributaries viz. Madei, Surla, Kotrachi, Ragda, Khandepar, Kudnem, Valvanta, Bicholim, Assonora and Sinker.

As far as North Goa District is concerned, Bicholim and Sattari Talukas are mainly affected due to floods due to River Valvonti, whereas the other Talukas of Tiswadi, Bardez, Pernem and Ponda are flooded either due to low lying areas or due to temporary rise in water level of nearby rivulets.

Flood	<ol style="list-style-type: none"> <li>1. Loss human and bovine life.</li> <li>2. Damage to crops, infrastructure.</li> <li>3. Damage to houses, livelihood systems.</li> <li>4. Destruction of public property.</li> <li>5. Severe stress and Psychological disorders.</li> </ol>	<p><b>Communication Network:</b> Road network of the affected areas, Telephone connections.</p> <p><b>Private Infrastructures.</b> Kutcha Houses, Semi Kutcha Houses.</p> <p><b>Agriculture.</b> Crops damage,</p> <p><b>Irrigation Sources.</b></p> <p><b>Electrical Installations.</b></p> <p><b>Drinking Water Sources.</b> Tube-wells, Wells, PWD</p> <p><b>Educational Institutes.</b> Primary Schools, High Schools, Colleges.</p> <p><b>Live stock.</b> Cows, Buffalos, Goats/ Sheep, Poultry Farms,</p> <p><b>Vulnerable People.</b> Handicapped, old/Aged, Pregnant women, lactating mothers, Sick and ailing/ diseased, children below 5 years.</p> <p><b>Other vulnerable assets.</b> Flood embankments, Canal embankments, irrigation Projects, Cashew Plantations Small Scale industries, Sericulture Units Casurina Plantation, Fishing Boats, Fishing nets.</p>	Tiswadi, Bicholim, Sattari Talukas.
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#### 4. Soil Erosion

## At Risk –Locations in Goa

Coastal erosion, or coastal instability, threatens property and businesses and puts people living near cliffs and shorelines at risk. The great concentration of national resources in coastal zones makes it imperative that coastal change is well understood.

Along the coastline of Goa, sea /coastal erosion has been observed on the beaches Siolim, DonaPaula, Anjuna beach. Additionally, according to a study by the National Institute of Oceanography, the beach along the Candolim-Sinquerim coast has been affected by erosion due to the grounded super tanker M.V. River Princess

### 5. Landslides

#### History of Occurrence:

Incidences of Landslides in Goa (no year)			
Sr.No.	Taluka	Location	Severity of Landslide
1	Tiswadi	Aradi, St. Cruz.	Low
2	Bardez	Nerul	Low
3		Malim, Betim	Low
4		Gaunswada, Mapusa	Low
5		Alto Betim, Mapusa – Panaji NH-17, Near Mandovi Bridge.	High
6		Pernem	Vaidongor,

The landslides specified at 1 to 4 and 6 above were of low nature as far as the severity is concerned. In this cases, some boulders had slid down towards the residential structures / school buildings thereby causing severe damages to the structures.

However, the landslide that took place on Mapusa – Panaji NH-17 during the monsoon, 2007 was of high severity as the vehicular traffic on this road was obstructed almost for a month.

The Government of Goa needs to prepare the Landslide Hazard Zonation (LHZ) Map of Goa detailing areas and zones that are prone to landslides. As well a Landslide Risk Zonation map of Goa needs to be prepared (This task can be assigned with the Geological Society of India

#### Vulnerability

Landslide	6. Loss human and bovine life. 7. Damage to crops, infrastructure. 8. Damage to houses, livelihood systems. 9. Destruction of public property. 10. Severe stress and Psychological disorders.	<b>Private Infrastructures.</b> Kutcha Houses, Semi Kutcha Houses. <b>Electrical Installations.</b> <b>Live Stock.</b> Cows, Buffalos, Goats/ Sheep, Poultry. <b>Vulnerable People.</b> Handicapped, Old /Aged, Pregnant women, lactating mothers, Sick and ailing / diseased, Children below 5 years	Whole of North Goa District
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#### 6. Tsunami in North Goa District :

As far as the North Goa District is concerned, the coastal belt was not recorded any Tsunami in the past. However, the Tsunami of 26th December, 2006 in the Bay of

Bengal had caused after effects in the sea and rivers. No loss of lives or damages to the properties were reported, except some vessels in the sea were reported to have been damaged.

## **7. Chemical**

### **History of occurrence:**

In Goa however transport accidents are quite frequent, though no statistics were available with the Government of Goa to validate these claims. However there have been rare casualties that have occurred due to the accidents of the Hazchem vehicles, for instance an accident that occurred in 1992-93 wherein a Hazchem tanker carrying Chlorine met with an accident leading to a leakage of the toxic gas and affecting some residents who were around the place of the accident including the fire fighting personnel who had to be hospitalized. There has also been an instance where in a tanker fell into a field that was being cultivated and as a result of the leakage of the Chemical which was corrosive in nature the land became infertile for cultivation.

**In North Goa till date no Major Chemical Accident has been reported to the Inspectorate of Factories and Boilers from the MAH<sup>i</sup> units.**

**Manufacturing and Formulation Installations and Storage Units in the State that have been classified as Major Accident Hazard (MAH) Units.**

**Manufacturing and Formulation Installations & Storage Units Classified as MAH In North Goa :**

The MAH units in North Goa are well dispersed in the district making emergency planning a distributed exercise See Table 3 and Table 4

The basic hazards posed by MAH units in North Goa are explosion and fire from storage and handling of LPG. These include facilities of Goa Glass Fibre Limited, HPCL LPG Bottling plant, and Rod Mill of Finolex Limited, Nestle, Filpack and others in North Goa. While thermal radiation from fires in these terminals is unlikely to have serious impact Off- Site with sufficient time with the local public to protect themselves from the radiant heat, explosion effects can travel significant distances off- site affecting public safety except in the case of Nestle where bullets installation are placed under cover of earth thus reducing the risk of fire and explosion to a minimum.

The storages of ethylene oxide and propylene oxide at Venus Ethoxylates Private Limited, Esteem Industries and Omni Impex are other significant areas of concern from both fire and explosion and toxicity angles.

The main toxic hazards of concern present in North Goa are:

Chlorine **Storages** at the facilities of Syngenta India Limited and the various Water Works of Goa State located at Opa and Assanora

There are also large number of toxic chemicals handled by Syngenta India Limited and other potential users that could become airborne and be transported off-site to affect the public.

**Note:** Both Liquid ammonia and chlorine tonne storage in containers will have consequence of off-site as they could get airborne in the event of loss of containment. This affects the neighbouring public and environment.

Phosphoric acid on the other hand is a stable liquid under normal conditions. It can affect neighbouring population as an irritant and corrosive material. It could also affect the marine environment in the event of finding its way into the estuary.

### **Transportation hazards in Goa**

Hazardous material enters North Goa by road for local consumption in the state as well as transit to neighboring states. No statistics or records are available indicating the nature and quantity of such material. In the absence of details of such material emergency planning has been done on a generic basis. The only information available on the transportation of hazardous chemical in Goa until 2009 was in respect of the MAH units

based on their usage pattern. The main products transported to/from these units included liquid chlorine, petroleum products in tankers, liquefied petroleum gases in bulk and in cylinders, ammonia and phosphoric acid and chemicals in loose and in bulk form. According to the Directorate of Transport the most common chemicals that are transported into Goa are tankers transporting LPG, Sulphuric Acid, Caustic Soda, Ammonia, Naphta, Chlorine, Sodium Sulphate, Bhromine Chloride, Aviation Petroleum However prior to 2009 no such details have been maintained.

The main reasons cited for vehicles carrying Hazchem materials meeting with accidents are the negligence of the driver and the poor deisgn of roads which are too narrow to enable smooth flow of traffic.

The routes by which the Vehicle carrying Hazchem goods ply by are through the national and state highways of the talukas of north Goa are Pernem, Bardez, Bicholim, Sattari, Tiswadi, Ponda. The entry point for the Hazchem vehicles in the North is Patradevi. The Highway that passes through the Ponda Taluka is very close to the residential areas and hence it was suggested that the government could build a bridge parallel to the existing one over the river Zuari so that the Hazchem vehicles do not have to go to the North via the Ponda Taluka.

### Pipeline Hazards

**North Goa District has no pipelines transport of hazardous material.**

Table 3: FIRE AND EXPLOSION DAMAGE SCENARIOS FROM MAH INSTALLATIONS IN NORTH GOA							
No	MAH unit/ Activity	Taluka	Population	Material	Quantity	Affliction Distance, m.	Potential Damage
1	Goa Glass Fibres Ltd., Colvale	Bardez	2,27,695	LPG	2*30 T	371	Offsite damage

2	FinolexCables Limited (Unit II), Usgaon- Tisk	Ponda	1,49,441	LPG	2*47T	431	Offsite damage
3	Hindustan Petroleum Corpn. Ltd.(LPG Bottling) Plant, Kundaim	Ponda	1,49,441	LPG	3*150T	635	Offsite damage
4	Venus Ethoxyethers Private Ltd. Bicholim Industrial Estate	Bicholim	90,734	Ethylene Oxide	7.5 T	410	Offsite damage
5	Venus Ethoxylates Private Ltd. Bicholim	Bicholim	90,734	Propylene Oxide	7.5T	221	Offsite damage
6	FilpackIndia Private Limited, Pillerne Industrial Estate	Bardez	2,27,695	LPG	2*10 T	260	Offsite damage
7	Syngenta India Ltd. Santa Monica Plant, Corlim, Ihas	Tiswadi	1,60,091	TMA	7.5T		Offsite damage
8	Esteem Industries Pvt. Ltd, Pissurlem Industrial Estate	Sattari	58,613	Ethylene Oxide	7.5T		Offsite damage
				Propylene Oxide	14T		
9	Omni Impex Pvt. Ltd. PissurlemIndustrial Estate, Honda	Sattari	58,613	Ethylene Oxide	7.5T		Offsite damage
10	Nestle, Usgaon	Ponda	1,49,441	LPG	50T		Onsite damage
11	Road Tanker			LPG	18T	313	Offsite damage
12	Road Tanker			M.S.	12Kl	60	Offsite damage
13	Road Tanker			Ethylene Oxide	14T		Offsite damage

14	Road Tanker			Propylene Oxide	16T		Offsite damage
Source: Government of Goa (April 2002) North Goa District: Off site Emergency Plan, Overview of Hazards in North Goa.							
Note1: This Table has been updated based on data provided by the Insoectorate of Factories and Boilers.							
Note2: Offsite Damage could also take place due to run -off from site							

Table 4: TOXIC RELEASE HAZARDS MAH UNITS/ ACTIVITIES IN NORTH GOA												
No	MAH unit/ Activity	Taluka	Population	Material	Quantity	Affliction Parameters			Affliction Parameter			Remarks
						3m/sec "D"			1m/sec "F"			
						X,m	Y,m.	T, min	X,m	Y,m.	T, min	
1	Syngenta India Ltd, Corlimlhas	Tiswadi	1,60,091	Chlorine	910 kg	3,620	556	20	8,250	581	90	Chlorine Tonners
2	Opa Water Works, Usgaon-Tisk	Ponda	1,49,441	Chlorine	910 kg	3,620	556	20	8,250	581	90	Chlorine Tonners
3	Assanora Water Works, Assanora	Bardez	2,27,695	Chlorine	910 kg	3,620	556	20	8,250	581	90	Chlorine Tonners
Source: Government of Goa (April 2002) North Goa District: Off site Emergency Plan, Overview of Hazards in North Goa												



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**2.3 DISASTER PROBABILITY IN VARIOUS MONTHS:**

Type of disaster	Jan	Feb	March	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Cyclone				←→				←→				
Flood					←→							
Earthquakes	←→											
Man made / Industrial / disasters /	←→											
Landslide	←→											

2.4 SPECIFIC VULNERABILITY OF RIVER –SYSTEMS:-

<b>Sr. No</b>	<b>Name of river and its weak and vulnerable point</b>	<b>Location (areas affected)</b>	<b>Reasons of vulnerability</b>	<b>Populations affected</b>	<b>Remarks</b>
1.	Valvanti River, Tributary of Mandovi	Market Bicholim	Low Banks and simultaneous Occurrence of heavy rainfall and High Tide	2000 (approx)	Earthern flood protection embank not constructed w / 7 to RL
2.	-do-	Market, Sanquelim	-do-	500 (appx.)	Earthern flood protection embank not constructed w / 7 to RL7200

## CHAPTER – 3

### INSTITUTIONAL ARRANGEMENTS AT DISTRICT LEVEL

#### 3.1 DISTRICT DISASTER MANAGEMENT AUTHORITY (DDMA):

As required u/s 25 of Disaster Management Act, 2005, the state government vide Order No.19/5/2005/RD dated 21-09-2006, has constituted the District Disaster Management Authority (DDMA) for North Goa District, under the Chairmanship of District Collector to evaluate the disaster preparedness for different types of calamities that may occur from time to time, with primary aim to take stock of the situation, monitors routine preparedness, suggest improvements in the response mechanism and to formulate a comprehensive District Disaster Management Plan for North Goa District. The DDMA is the apex planning body at the district level and will play a major role in disaster preparedness and mitigation. The DDMA has the primary responsibility of:

- Reviewing the threat of disasters.
- Vulnerability of the district to different disasters.
- Evacuation process to reduce risk and emergency response.
- Considering suggestions for improvement of the DDMP.
- To educate the public on different flood and cyclone hazards.
- To disseminate information about the protective steps, Dos & Don'ts.
- To make arrangements for emergency action.
- To effect evacuation from the affected areas if necessary.
- Search and Rescue Operations.
- Immediate mitigation and Relief Measures.
- Overall rehabilitation strategies and effort.
- Post disaster action and review.

The DDMA will meet at least once in six months i.e. in the month of April and November before the onset of the monsoons, under the Chairmanship of the District Collector to update the DDMP. For this one month's prior notice should be given to all concerned departments before convening the meeting. An emergency meeting will be held whenever pre-disaster warning is received from the IMD or the Coast Guard about any approaching Depression or if heavy rainfall warnings are received. The Committee will meet almost daily till the emergency is over. The DDMA would consist of following functionaries:-

1.	Collector & District Magistrate (North)	- Chairperson.
2.	Chairperson of the Zilla Panchayat (North)	- Co-Chairperson.
3.	Additional Collector/ADM(North)	- Chief Executive Officer/Member
4.	Superintendent of Police (North)	- Member
5.	Director of Health Services	- Member
6.	Principal Engineer, P.W.D.	- Member
7.	Director, Fire & Emergency Services	- Member

Any other official, technical expert or representative of the leading NGO or prominent citizen can be co-opted as Consulting Members after taking approval of the DDMA. The DDMA should also take review of changes in the indicators pertaining to the district like creation of additional infrastructure, development projects, changes in inventories, etc. and incorporate these changes while updating the DDMP. All the members are expected to substantiate/assist the DDMA with all the updated information about their concerned areas of operation.

### 3.2 **DISTRICT CONTROL ROOM:**

The District Control Room (DCR) shall be the nerve-centre of the disaster management and response machinery in North Goa district. All the activities pertaining to the tackling of any emergency scenario in the district right from the receipt of the early-warnings to the final rehabilitation measures, shall be guided, controlled, managed, implemented, monitored and reviewed from the DCR. The DCR aims for an effective and realistic response mechanism based on the DDMP with fail proof communication, accurate databases in order to make optimal utilization of Men, Material and Resources to prevent the loss to lives as well as minimize the loss of property.

#### 1. **Basic Objectives of DCR:**

- To implement, co-ordinate and ensure a speedy administrative response to any disaster situation the district.
- To ensure that the disaster response is as per the situation requirement and largely based on the DDMP.
- To effectively manage and utilize the available men, material and resources in the district.
- During disaster time, DCR will operate under the central authority of the District Collector, exercising powers to issue directives to all line-departments to provide emergency response service.

- DCR will be manned round the clock during disaster time to ensure rapid emergency responses. In any case, DCR shall function 24 hrs from 1st of May to 30th of September every year.
- DCR will co-ordinate with the State Disaster Management Authority (SDMA) and State Control Room (SCR) for appropriate support, guidance and smooth flow of information.
- DCR shall be operationalised by the Civil Administrative Branch (CAB) of the Collectorate, North Goa.

## 2. **Officer in-charge of the DCR:**

DCR shall function under the overall charge of the District Collector. During crisis, in the absence of Collector, Addl. Collector-I & ADM (North) or any other officer on duty at that point of time shall remain in overall charge of DCR. Deputy Collector in-charge of the CAB Section in the Collectorate shall be the Emergency Officer, responsible for the actual functioning and operations of the DCR under the guidance and control of the Collector/

ADM-I / II. The person in charge of control room shall be personally responsible for implementing the basic objectives of the DCR/SOP, as indicated hereinafter, and sign on behalf of the Collector on all reports & take all decisions as outlined below for effective management of the situation. The chain-of-command in the DCR shall be as follows:

Sr. No.	Designation
1.	Collector & D.M.
2.	Addl. Collector-I & ADM-I
3.	Addl. Collector II & ADM-II
4.	Dy. Collector (In-charge CAB Section)
5.	Dy. Collector (Revenue)
6.	D.R.O.
7.	Mamlatdar-in-Collectorate
8.	Section Officer/Head Clerk (CAB Section).

## 2. **Assembly in DCR:**

It shall be mandatory for the following staff and officers to assemble in the DCR on getting any information from any source about an emergency situation. District Collector, ADMs, SP, Director Fire Services, DHS, CE-PWD, DMA, Dy. Collectors in Collectorate, SDOs, concerned Mamlatdars, Dir Civil Supplies, DIP, and Dir Transport, all staffs of the CAB/Confidential/Magisterial/Establishment section, Stenographers to Collector

and ADMs and other staffs as desired by the Collector. Apart from these, any other officer or staffs who gets the information from any other sources will reach/inform the DCR immediately for further directions.

#### **4. Arrangements in DCR:**

The District Collector should ensure that DCR is equipped with the following-

- District Disaster Management Plan (DDMP) in Hard and Soft copies.
- District maps showing identified School Buildings cum Cyclone shelters/ Relief camp sites and high elevated places identified as temporary shelters.
- Vulnerability map.
- List of resource persons with contact numbers and address.
- Data base on Resource & Inventory.
- First Aid & other basic medical assistance.
- One retiring room with adequate facilities.
- Generator sets/emergency light/candles etc.
- Telephone with STD facilities.
- Fax machine.
- Computer with printer & on-line UPS facilities.
- Type-writer.
- Stocking adequate stationery like paper reams, registers, pens, pencils, staplers, photocopy papers, fax-paper roll, spare cartridge for printer, spare toner for photocopier, markers, rulers, chart-papers, writing boards,
- Fire extinguisher, white hard board & soft board, markers, dusters.
- Before the onset of the monsoons, by 15th of April, the following is also recommended:
  - i. Shift one more phone line to DCR.
  - ii. Keep a Radio with new batteries ready, Generators sets (if available) to be kept ready.
  - iii. Requisition two 4- wheelers ready for emergency operations with 24hrs drivers on duty.
  - iv. Staffing of the DCR and preparation of duty roasters. The DCR should always have an Officer-in-charge, one stenographer, one clerk, one peon and a driver on a 24hr basis. During the nighttime, one clerk, peon and a driver should be stationed and the Officer-in-charge should be available on-call.

#### **3. Standard Operating Procedure (SOP):**

- On receipt of an Early-warning from any source like IMD, Coast Guard, SCR etc, the Officer-in-charge of the DCR shall-
  - i. Immediately inform the Collector, Addl. Collector and pass the message to SCR.
  - ii. On getting direction from the Collector, or in his absence, Addl. Collector or the Nodal Officer of the SCR, he shall alert all field-level officers like SP, SDOs, Mamlatdars, BDOs, DHS, Captain of Ports, Director of Agriculture/ Transport/Panchayats/Fisheries/Municipal Administration, DIP who will coordinate the information dissemination to the media.
  - iii. The format of the warning message shall be as follows:

<p><b>Emergency Warning Message No:</b></p>
<p><b>Date:</b></p>
<p>To,</p> <p>SP, SDOs, Mamlatdars, SDPOs/PIs, BDOs, DHS, Captain of Ports, Director of Agriculture /Transport /Panchayats /Fisheries /Municipal Administration/ Education/ Animal Husbandry, PCE-PWD, CE-PWD I &amp; II, CE-WRD, DIP.</p>
<p>Space for message</p>
<p>CRASH</p>

Collector

Collector & D.M  
(North Goa)

- iv. All HODs shall ensure that they remain in station till the emergency is over.
- **Prepare a logbook:** Record chronological sequence of the events from time to time.  
**Coordination meeting of the DDMA** shall be convened as soon as possible after verifying the disaster threat and in any case at regular intervals of 12 hrs after the disaster strike in DCR to take stock of the situation, if possible and apprising SDMA/SCR/ Nodal Officer SCR.
  - **Food stock:**
    - i. Check up availability of food (rice and other commodities) and kerosene at Civil Supplies Godowns/FPS especially in inaccessible pockets. Mamlatdars shall contact all Godown owners/FPS owners and shall personally visit, as far as possible, the Godowns/FPS and verify the stocks. The Agents/FPS owners shall remain present at the store/Shop round the clock.
    - ii. The Civil Supply Officer should be informed to remain alert for procurement of dry foods/essential commodities at short notice.
    - iii. Start movement of food stock from concerned headquarters to areas that are affected or likely to be cut-off.
  - **Transport:** Place requisition to the Director Transport for deployment of vehicles. Considering the gravity of the situation and after consulting the DDMA, atleast 5 LMVs, 1 mini bus and 1 pick-up truck should be requisitioned immediately.
  - **Empower Field level Officials:** To requisition vehicles from Government Department / Corporation and Autonomous Bodies & dispatch 10 Requisition forms to each Mamlatdar concerned of the affected areas.
  - **Immediately freeze the POL** stock with government garages and also different Petrol Pumps (if required) and start rationing of release to various government vehicles.
  - **Boats/ Canoes:** Requisition of boats and canoes within the District from the Director of Fisheries / COP and Private authorised owners. Also dispatch 15 Requisition forms to the concerned Mamlatdar.

- **Assessment of Health Sector:**
  - i. Check up the stock of medicines required. If necessary, send immediate requisition to DHS concerned for procurement.
  - ii. Ensure that medical Officers are in place at the PHCs and UHCs through DHS/ and Mamlatdars.
  - iii. DHS shall decide the location of health camps to be setup if necessary.
  - iv. DHS to ensure that Medical teams of doctors, nurses and para-medics, as previously determined area-wise, report with their vehicles and drivers and remain in station till the emergency is over.
  
- **Closure of Educational Institutions:** After making an assessment of the magnitude of the emergency/calamity and in consultation with the SDMA.
  
- **Veterinary Services:** Immediately contact DAHVS and ensure that Veterinary Doctors are deployed according to the requirement. Also assess the position of vaccines and fodder availability, if required, place requisition.
  
- **Air Dropping Requirement:** Even though Goa has not seen any major air dropping operations, it is essential that all the Zonal Officers are consulted and requirement of Air-dropping is assessed, and if required, the food dropping zones are identified and make the advance list of villages where air dropping may be needed.
  
- **Fire Services:** Each Fire Station shall keep ready at least a team of 10 persons with axes and saws along with one chain-pulley system with labourers, in reserve, for deployment as per directions of DCR.
  
- **Labourer Squads:** Direct CE-PWD to ensure that a squad of 20 labourers is stationed immediately at all the Fire-stations in the effected Talukas and one squad of 20 labourers at the DCR for emergency deployment.
  
- **Rescue operation/Evacuation** by teams (already identified) providing infrastructure facility and movement to rescue centers.

- **Management of Rescue shelters.**
- **Assessment of Relief Items Available and Required:** Make a thorough assessment of Relief Items available in stock at different places of field as well as District & State Head Quarters.
- **Administration of relief,** dispatch of relief to the affected areas after carefully logging all items, time of dispatch, area of receipt, time of receipt and monitoring the relief operations.
- **Civil Society:**
  - i. Immediately contact the Civil Society Organisations/NGOs active in the affected areas/sectors and allot them specific roles and functions. Get them introduced to the field functionaries. Ask them to prepare a list of volunteers.
  - ii. Make a quick inventory of their resources for quick assessment of district needs and expectations from different agencies.
  - iii. Ensure that there is no duplication of efforts/resources in any particular location/relief activity.
- **Functional Distribution of Work:** In each of the affected Zones, the Zonal Officer concerned, under the supervision of the SDO, shall do the following functional distribution of works. Each team will have staff and resources for which the concerned Zonal Officer shall do necessary requisition. The team leader will have full powers to take individual decisions.
  - i. Transportation team.
  - ii. Stock and store team.
  - iii. Finance team. iv. Information and Office documentation team.
  - iv. Food and other relief items team.
  - v. Media and public relations team.
  - vi. Civil society liaison team.
- **Press Briefing/Media:** It is extremely important that factually correct and authenticated information is passed on to the media for creating awareness and spreading the right messages to the people. Healthy media coverage of the disaster also helps in preventing the spread of unnecessary panic and aborts rumor mills. A daily Press Brief shall be issued from the DCR at 1800 hours and the standardized Format of the same would be as follows:

North Goa District Press Note No.

Dated:

Disaster Details:

Day Number

No.		Total	Affected		Remarks
1	Blocks/Towns				
2	Villages				
3	Population				
4	Severely affected areas				
5	<b><u>Rescue measures</u></b>				
	Boats/canoes deployed				
	Army/Navy/Coast Guard				
	Police/Fire brigade				
	Other agencies				
	Exemplary events				
6	<b><u>Relief measure</u></b>	Quantity	No. of Beneficiaries	Villages covered	Days Covered
	Free Kitchens				
	Rice				
	Other dry food				
	Blankets/clothing				
	Polythene Sheets				
	Tents				
	Cattle feed				
	Medicines				
7	<b><u>Casualties</u></b>	Number	Village/Taluka	Remarks	
8	<b><u>Missing reports</u></b>				
9	<b><u>Bovine death</u></b>				

10	<b><u>Civil Society Organisations</u></b>				
11	<b><u>Damage to property</u></b>	<b><u>Number/ Location</u></b>	<b><u>Approx, Value</u></b>		
	I. Roads				
	II. Embankment breaches				
	III. Schools				
	IV. Other public buildings				
	V. House damage				
	VI. Electrical installations				
	VII. Others				
12	<b><u>Forecast in next 24 hours</u></b>				
13	Message for people				
14	Other details				

➤ Messages to the Public: The DCR shall issue messages in public interest for the general awareness of the people in the affected areas as also the surrounding areas through AIR, DD, Cable TV Network etc. The messages should be specific and include direction like:

- i. Remain alert.
- ii. Pay heed to the official warnings.
- iii. Cooperate with the Disaster management response teams and follow directions.
- iv. Take shelter in nearest pucca building / cyclone shelters / schools and other high elevated places.
- v. Keep cattle tied in open spaces / let free
- vi. Keep sufficient dry food.
- vii. Keep Emergency Kit ready, which may include emergency light, basic first-aid, equipment, cash/valuables, torch etc.

➤ Daily stock of the situation by District Magistrate and Addl. District Magistrate.

➤ **Command Structure in Collectorate:**

Nodal Officer	District Collector (In the Office).
Nodal Officer	ADM (on the site of disaster)/Deputy Collector (on site)
In-charge of DCR	ADM-I/ Deputy Collector (Under overall charge of the District Collector)
Team to be sent to the site	ADM + SDM + concerned Mamlatdar + Talathis + Peon + Labourers (3-4)

➤ **PROFORMA FOR "IN" MESSAGE REGISTER:** ( To be maintained in Control Room)

Sr. No.	Message No	Date	Time of Receipt	Received From	Address to	Message Sent to	Copies to	Mode (WL?Tel/Messgage of receipt	Mode (WL/Tel/Messgage of dispatch	Instruction /follow-up to be done
1										
2										
3										

➤ **PROFORMA FOR "OUT: MESSAGE REGISTER:** (To be maintained in Control Room)

Sr. No.	Out Message Sr. No	Date	Time of Dispatch	Related in Message No. any	Address from	Address to	Copies to	Mode (WL?Tel/Mess- age of receipt	Mode (WL/Tel/Message of dispatch	Instruction/follow-up to be done
1										
2										
3										
4										
5										
6										
7										
8										

➤ **Preparation of Daily Situation Report:**

4. Emergency Response Checklist on Receipt of Warning:

Sl. No	Officials	Responsibilities
1.	District Collector	<ul style="list-style-type: none"> <li>• Emergency Meeting</li> <li>• Overall disaster management.</li> <li>• Fixation of Responsibilities to different officials</li> <li>• Instruction to block level officials</li> </ul>
2.	S.P.	<ul style="list-style-type: none"> <li>• Interaction with Collector and other official regarding situations.</li> <li>• Deployment of Forces for relief Operation</li> </ul>

3.	D.H.S.	<ul style="list-style-type: none"> <li>• Stock and storage of medicine at different points.</li> <li>• Charge distribution and deployment of different medical teams in affected areas.</li> <li>• Temporary Distribution points as well as setting up of delivery mechanism</li> <li>• Vehicle deployment and establish of mobile Vans/Ambulances.</li> </ul>
4.	C.S.O.	<ul style="list-style-type: none"> <li>• Collector &amp; Diversion of food and other materials for affected area</li> <li>• Stock positions at different locations.</li> </ul>
5.	Director fire Services	<ul style="list-style-type: none"> <li>• Deployment of fire Brigade and S &amp; R Teams in the affected area.</li> </ul>

6.	Dir. of Transport/ MDKTC	<ul style="list-style-type: none"> <li>• Requisition of vehicle.</li> </ul>
7.	EE Govt. Garage	<ul style="list-style-type: none"> <li>• Allocation of POL to emergency response vehicle.</li> </ul>
8.	DIP	<ul style="list-style-type: none"> <li>• Information and Communication Facilities</li> </ul>
9.	CE-WRD/Irrigation	<ul style="list-style-type: none"> <li>• Continuous monitoring of the river systems and embankments.</li> </ul>

**5. Coordination and linkage checklist for DCR:**

S.No	Time	Coordination Linkage
1	Preparedness	<ul style="list-style-type: none"> <li>➤ Considering the gravity of situation the Collector shall convene the meeting of DDMA.</li> </ul>
2	Pre-crisis- After warning	<ul style="list-style-type: none"> <li>➤ Meeting with district level officials at DCR and work out emergency plan with vulnerable areas and resource list.</li> <li>➤ Co-ordination meeting of NGOs/PRIs.</li> <li>➤ Assignment of duties.</li> <li>➤ Pre-positioning of staff in the likely cut off areas.</li> <li>➤ Arrange food and other basic requirement for emergency response.</li> <li>➤ Collect information from different areas, analyse and act accordingly.</li> </ul>
3	During crisis	<ul style="list-style-type: none"> <li>➤ Co-ordination meeting with officials at Headquarters by 12 hours intervals and 24 hours intervals with the field officials (if possible).</li> <li>➤ Regular collection of situation report of vulnerable areas from the Zonal Officers or Special Officer dispatched for the purpose.</li> <li>➤ Execution and monitoring of S &amp; R Operations and administration of Relief.</li> <li>➤ Contact with SDMA/SCR for continuous information exchange and requirement of relief material and other</li> </ul>

		<p>logistic support.</p> <ul style="list-style-type: none"> <li>➤ Deputation of Volunteers/ assigning work to NGOs to different affected areas.</li> <li>➤ Keep regular link with SDMA/SRC/Field level CRs.</li> </ul>
4	Post Crisis	<ul style="list-style-type: none"> <li>➤ Proper shelter/Relief camp management.</li> <li>➤ Immediate arrangement of free kitchen in the cut off and inaccessible areas.</li> <li>➤ Relief distribution and monitoring.</li> <li>➤ Transportation of Relief and Human Resources.</li> <li>➤ Provision of drinking water and proper sanitation facilities.</li> <li>➤ Provision of Medical facilities.</li> </ul>
		<ul style="list-style-type: none"> <li>➤ Repair/Restoration of Roads and other infrastructure.</li> <li>➤ Helping the evacuees for returning to their houses.</li> <li>➤ Provision of Post-Traumatic Psychological Counselling to the survivors.</li> <li>➤ Regular link with SDMA/SCR.</li> <li>➤ Post disaster analysis of the administrative response, adequacy of response strategies, inter-departmental coordination, resource availability, response and functioning of various factors, shortcomings, measure to upgrade the response and upgradation of DDMP.</li> </ul>

#### **6. Normal Time Activity for the DCR:**

The normal time activities of the DCR under the guidance of the District Collector is to-

- Ensure that all warning and communication systems, instructions are in working condition.
- Receive information on a routine and regular basis from the departments.
- Receive reports on preparedness from the relevant district-level departments and other line departments, as per the formats. Based on these reports, the DCR will forward the Preparedness Measures details to the Collector.
- Upgrade and update the DDMP according to changing scenarios in the district.
- Updation of Resource Inventory.

- Monitor preparedness measures including Mock-drills/ simulation exercises undertaken by various departments
- Ensure proper dissemination of DDMP at the district level, local level and in the vulnerable areas.
- Identify appropriate NGOs/Civil society Organization, with their capacities who can be mobilized during the time of disaster and who can play a role in devising Community based DMPs and impart necessary training to the volunteers.
- Organize post- disaster evaluation and update DDMP accordingly.
- Weather tracking and early warning dissemination.
- To collect and transmit information regarding matter relating to natural calamity.
- Mapping of vulnerable areas.
- Database on civil society organizations and their activities
- Database on volunteers
- Facilitate regular meetings of civil society organizations at DCR to assess strengths and weaknesses and to assign specific tasks and responsibilities.
- District level training of officials and NGOs in emergency response.
- Organizing IEC activity through Posters, street plays, village task forces/Volunteers training.
- Emphasizing on insurance coverage of livestock/ crops/industry/works shop etc.
- Creating awareness among general public during Normal Time to ensure human life.
- Strengthening of weak and vulnerable points in river/canal embankments.
- Advance preparatory/mock drills through NGOs/CBOs on management of Disaster.
- Ensure proper functioning of electronic communication system available
- Updating of Telephone numbers.
- Collection of list of eminent agencies for their involvement at the time of disaster.
- Updating of Maps displayed in DCR with up-to-date information.
- Review of advance preparation undertaken at field level.

## **7. Field - Level Control Rooms:**

Similar to the DCR, control rooms are also to be formed at Sub-division and Taluka levels, which will be supervised by the SDO/Dy Collectors/Zone Officer concerned during emergency periods. The procedures for these control rooms are as follows:

- Control Rooms are to be managed by an Aval Karkun (AK)/ CI, clerk and a peon.
- Immediately after getting warning about flood/cyclone, one Gazetted Officer along with the above staff should be deployed in the control room.

- The Head of office will ensure proper working of the control room telephones.
- A register will be maintained in the control room to record the messages and warning received over telephones and action taken thereon in the same format as in DCR..
- The Field-level Control Rooms will keep constant touch with the DCR during and after occurrence of any calamity.
- In case any message of devastating nature is received, this should immediately be passed on to Collector/Addl. Dist. Magistrate/concerned Dy Collector and necessary action to be taken according to their instructions.

## **8. How To Document a Disaster:**

Proper documentation of the disaster and the entire administrative response to handle the disaster is the crucial foundation on which the upgradation of the DDMP and future success of the administration in disaster management is dependent on. In the event of any natural disaster, like floods, cyclone etc, records can be maintained date wise from the first receipt of early warning till the final rehabilitation.

- History of the Event –
  - i. Cycle of the event.
  - ii. Nature.
  - iii. Intensity. iv. Past data on the damages caused.
- Causes of disaster-
  - i. Climate ii. Geological
  - ii. Environmental Degradation.
  - iii. Any other Causes.
- Map of the affected area showing areas highly affected, moderately affected and less affected.
- Damage Assessment –
  - i. Human life
  - ii. Livestock.
  - iii. Houses.
  - iv. Infrastructure.
  - v. Agriculture.
  - vi. Horticulture.
  - vii. Silviculture.
  - viii. Ecology/Environment.
  - ix. Others.

➤ **Response** –

i. (Government Response):

1. State Government.
2. Central Government ( Various sector like Army / Health Services /Civil Defence etc.)

ii. (**Non-Government Response**):

1. Local.
2. National.
3. International.

iii. (**Community Response**):

➤ **Rehabilitation** –

- i. Temporary Shelter.
- ii. Physical Rehabilitation.
- iii. Social Rehabilitation.
- iv. Psychological Rehabilitation.
- v. Economic Rehabilitation.

➤ Self-Assessment for improvement of services in future / existing shortcomings.

➤ Community Perception about relief (Independent survey by some professional organization).

➤ Lesson learned and future strategy.

## CHAPTER – 4

### ROLE AND RESPONSIBILITY OF DIFFERENT OFFICERS/OFFICES

#### 4.1 District Collector & Chairman DDMA:

- The District Collector will be the over all coordinator of all disaster management efforts in the District as the Chairman of DDMA.
- The Collector will coordinate the District level response of all the concerned line departments/officers assisting him.
- The Collector may co-opt. any other officers or specialist to assist him/her in carrying out the activities of the DDMA.
- Preparation of the DDMP with the assistance of A.D.M-I/II (In-charge of Emergency ) and the Emergency Officer.
- Organization and functioning of DCR
- Preparation of the various Maps like Vulnerability map of the district, transportation route/alternate safe-route map, location map of shelter/relief camps sites etc.
- Updated resource inventory of the district and capability analysis of various institution /departments at the district level.
- Assigning specific responsibilities to different agencies right from the stage of warning to relief and rehabilitation.
- Ensure constant communication with SCR and Taluka CRs
- Maintained effective liaison with media-print/audio-visual
- At the disaster site, specific tasks will be given to the designated officers to tackle the emergency.
- The Site Operations Centre (SOC), which will be supervised by the concerned Sub-Collector who will assist the Collector. Site Operation Manager / Zonal Officer (Mamlatdr) will co- ordinate the activities at the various camp sites and affected areas.
- The Site Operation Centre will report to the DCR directly and from there the information will pass to the Collector.
  
- Collector will co- ordinate all the field responses like setting up transit camps, relief camps and cattle camps and will respond to the SDMA / SRC accordingly.

- Collector will co-ordinate the activities of NGOs / CBOs and assign them specific tasks and district areas of operations to prevent duplication of efforts.
- Handling of VVIP visits and maintenance of law and order in the District.

**4.2 Additional Collector, Additional District Magistrate (ADM):** Additional Collector / ADM will lay a very crucial role in the disaster preparedness and operations to manage any emergency in the district. He will act as a trusted ally to the Collector and ensure that proper coordination and information channels are maintained to assist and support the Collector in the discharge of his duties.

- Liaison with all the concerned line departments / officials in conducting the DDMA meeting twice in a year, i. e. April and November.
- Actively supervise the functioning of DCR and communicate the information to the Collector.
- Monitor preparedness measures, training activities including mock – drills undertaken by various departments.
- Coordinate the activities during warning dissemination, evacuation, search and rescue operation, relief operation, resettlement and rehabilitation.
- Field visit to the affected areas and shelter/ relief camp sites and report preparation and forward to Collector for approval, sanction and onward action.
- Inform Collector of any changes including updating of data bank and Annexure/Formats.
- Ensure proper dissemination of DDMP at the district level, local level and in the vulnerable area.
- Organize post-disaster evolution.
  - Source and cause of the disaster.
  - Description of the response effort.
  - Recommendations for preventive and mitigation measures.
  - Plan for upgrading emergency preparedness and response plans.
- Update DDMP.

**4.3 Deputy Collector in-charge of DCR/Emergency Officer:** A Deputy Collector in the Collectorate would be made in-charge of DCR.

- His basic responsibility would be to ensure that smooth functioning of the DCR and ensure that proper information flow, into and from the DCR is maintained.

- He should also monitor, coordinate and implement the actions for handling an emergency as laid out in the DDMP.
- He should look after the safety and maintenance of the infrastructure available in DCR and ensure that it should always be in good working condition.
- To ensure round-the-clock operation of the DCR during disaster.
- Receive information on any disaster/emergency on a routine basis from the line department and forward to ADM/Collector.
- Update date bank and maintain an inventory of resources, materials and equipment half yearly.
- Ensure that during disaster, continuous updation of information in the standard format is maintained and forwarded to Collector every 6 hours.
- Prepare reports and documents on the disaster management efforts of the administration and forward to ADM/Collector.

#### **4.4 Superintendent of Police (SP):**

To ensure an efficient response to any disaster situation in the district, it is essential that Police works in close cooperation and coordination with the DCR. The SP shall remain in constant touch with the District Collector for assistance in rescue, evacuation and emergency relief measures.

- SP must work in close co-ordination with the District Collector on receipt of a warning or alert on an emergency situation.
- The Superintendent of Police must designate one senior officer of the Police for co-coordinating the activities of the Police Department in the DCR.
- On the receipt of disaster warning and after the onset of emergency, one senior officer of the Police shall remain in the DCR round-the-clock.
- During normal times, SP must assess the preparedness level of the force in the district and report the same DCR every six months.
- SP must have a list of vulnerable/disaster prone areas in the district, along with the details of nearest Police stations/Out posts and their contact phone numbers.
- SP must organize training programme on handling of hazardous chemicals for police personnel in collaboration with Inspectorate of Factories and Boilers to facilitate more effective handling of road accidents involving hazardous substance.
- SP must appoint a Nodal Officer for disseminating information to the DCR to press briefings.
- Play an active role in evacuation, S & R operation and relief activities.
- Escort/convey the relief material.

- Restoring road networks and communication links.
- Maintenance of Law & Order in the affected areas.
- Safeguarding of properties left behind by the evacuees.
- Handling VVIP visits and inspections.

#### **4.5 Responsibility of different Officers in the Pre & Post Disaster situations:**

Duties? Officers	Normal time	1 <sup>st</sup> warning	Post Disaster
DHS	<ul style="list-style-type: none"> <li>➤ Sufficient stock of medicines/disinfectants/vaccines should be kept ready at the PHCs/UHCs etc.</li> <li>➤ Quick Response medical teams should be formed, well in advanced and quipped with necessary facilities/transportation etc.</li> <li>➤ Adequate training should be given to the medical officers and staff in TRIAGE and handling disaster scenarios.</li> <li>➤ List if medical staff to serve in specific places should be drawn and kept ready in advance.</li> </ul>	<ul style="list-style-type: none"> <li>➤ The 1<sup>st</sup> warning of the cyclone/flood should be communicated to all the subordinate officers, Health Officers.</li> <li>➤ The staff of the entire Dept. should be alerted to attend the cyclone duty at short notice.</li> <li>➤ Sufficient No. of vehicles in good condition to be kept ready.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Dispatch Medical teams to the affected areas as soon as possible after the abatement of disaster.</li> <li>➤ The injured persons should be lifted to the nearest Hospital after first aids.</li> <li>➤ Preventive action to arrest spreading of infections diseases should be taken.               <ul style="list-style-type: none"> <li>a) Chlorination</li> </ul> </li> </ul>
	<ul style="list-style-type: none"> <li>➤ Keep sufficient first aid kits</li> <li>➤ To keep Ambulances.</li> <li>➤ The staff drafted for emergency duty should be asked to assume duty at their respective places</li> </ul>		<ul style="list-style-type: none"> <li>b) Disinfections</li> <li>c) Inoculation.</li> <li>d) to set up sufficient no of medical camps to meet the situation.</li> </ul>

	<p>of duty.</p> <ul style="list-style-type: none"> <li>➤ Sufficient No. of Medical Officers and motor staff should be drafted into batches and places of work should be allotted in the advance.</li> </ul>		<p>Record of all persons treated with full details should be maintained, as the particulars should be required at a later date.</p> <p>Reports on the performance should be sent by the staff on duty from time to time that in turn will keep the Collector informed of the situation</p>
CE- WRD/Irrigation	<ul style="list-style-type: none"> <li>➤ All vulnerable spots along the rivers should be identified.</li> <li>➤ The embankments/bounds should be strengthened .</li> <li>➤ It should be checked whether the passage bridge and canners are in good condition.</li> </ul>	<ul style="list-style-type: none"> <li>➤ 1<sup>st</sup> warning should be communicated to all the subordinate staff and employees</li> <li>➤ they should be alerted to check whether the canals and drains are in proper condition to allow free flow of water.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Repair/closure of branches if any to the embankment/nunds in the affected area.</li> <li>➤ Continuous monitoring of the gauge stations to check water levels.</li> </ul>
	<ul style="list-style-type: none"> <li>➤ The obstruction in the canals if any should be got removed immediately to be enabling free flow of water</li> <li>➤ The shutters of the canals are to be checked and satisfied that they are in good condition.</li> <li>➤ The instruments and materials etc. required</li> </ul>	<ul style="list-style-type: none"> <li>➤ Keep sufficient no. of vehicles for deployment of staff on emergency duty.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Reak time monitoring of the water level in various resevoirs like Anjunem etc.</li> <li>➤ Real time transmission of information about the quantity of water released from the</li> </ul>

	<p>attending to immediate repairs breach of closures etc. should be stacked at places where they may be required locating such places early.</p> <ul style="list-style-type: none"> <li>➤ All the Gauge station instruments should be checked.</li> <li>➤ Nodal officer should be appointed and quick response team should be formed in vulnerable area for urgent repairs etc.</li> </ul>		<p>dams/reservoirs to the DCR.</p>
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Director Fire Services	<ul style="list-style-type: none"> <li>➤ The Fire Personnel should be trained and equipped for handling disaster operations.</li> <li>➤ Adequate procurement of fire fighting and disaster management equipment/machinery etc. should be done.</li> <li>➤ The Brigades and other vehicles should be kept in good working condition.</li> <li>➤ Materials required for use in emergency should be indented for and kept in reserve.</li> <li>➤ Ensure proper functioning</li> </ul>	<ul style="list-style-type: none"> <li>➤ .The 1<sup>st</sup> Warning should be immediately communicated to fire stations.</li> <li>➤ The staff should be called on for duty and full complement of the staff should be available.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Removal of collapsed houses wall etc. should be attended.</li> <li>➤ Clearing of roads, cutting fallen trees, clearing electricity poles etc.</li> <li>➤ Persons involved in house collapsed should be promptly reserved.</li> <li>➤ Assist district response in evacuation and S</li> </ul>
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	<p>of the fire Control room.</p> <ul style="list-style-type: none"> <li>➤ All complaints/message received from public on disaster for help should be immediately attended.</li> <li>➤ Maintain close liaison with Collector &amp; DCR.</li> </ul>		<p>&amp; R operations.</p> <ul style="list-style-type: none"> <li>➤ Report on the relief activates, under taken should be promptly reported.</li> </ul>
CE- Electricity /CE PWD.	<ul style="list-style-type: none"> <li>➤ It should be ensure that the filed staff checks all the electricity lines and replace old materials used in the power supply.</li> <li>➤ All faults and weak-links are rectified.</li> <li>➤ Quick response teams should be formed in all areas, especially the vulnerable Zones.</li> <li>➤ A Nodal Officer should be appointed for coordinating with DCR.</li> <li>➤ Should ensure that all trees close to the lines are adequately pruned /trimmed.</li> <li>➤ The field staff should be in constant touch with Mamlatdars and inform the situation at frequent intervals.</li> </ul>	<ul style="list-style-type: none"> <li>➤ On receipt of the 1<sup>st</sup> warning it should be communicated to all the subordinate staff.</li> <li>➤ He should see that all the vehicles under his control are kept ready and in working condition.</li> <li>➤ Alert the entire staff to return their respective headquarter.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Restoration of powers lines on priority to:-</li> <li>1. Hospital, Water Supply.</li> <li>2. DCR/Field CRs.</li> <li>3. Fire Stations.</li> <li>4. Police station</li> <li>➤ Live wires on ground should be removed promptly.</li> <li>➤ Damaged or fallen electrical poles should be immediately replaced and obstructions on roads should be got removed.</li> </ul>
SP	<ul style="list-style-type: none"> <li>➤ Detailed SOP fixing various duties to different officers and personnel.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Soon after 1<sup>st</sup> warning of cyclone is received all the subordinate police staff should be</li> </ul>	<ul style="list-style-type: none"> <li>➤ Maintain constant liaison with Collector</li> <li>➤ Help should be rendered to the</li> </ul>

		alerted.	disaster affected persons to reach rehabilitation centers.
SP	<ul style="list-style-type: none"> <li>➤ Police wireless sets to be kept in order &amp; their installations position to be identified.</li> <li>➤ The officers and men should be given adequate training in disaster management operations.</li> <li>➤ Mock-drills to disseminate warning information to the public in flood zones/vulnerable areas.</li> <li>➤ Properties of the public should be guarded at the time of evacuation of the people.</li> <li>➤ V.H.F. sets to be set up at places identified.</li> <li>➤ Proper functioning of the Police Control room.</li> </ul>	<ul style="list-style-type: none"> <li>➤ The Home guards should be alerted.</li> <li>➤ Sufficient No. of vehicles should be reserved for emergency duty.</li> <li>➤ Sufficient quantity of petrol and oils to vehicles is ensured.</li> <li>➤ Communication of warnings through VHF to all police stations.</li> <li>➤ Police stations in turn to communicate to villages.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Injured persons should be transported to Medical Centres.</li> <li>➤ Record of identification of the dead should be maintained.</li> </ul>
Mamlatdars	<ul style="list-style-type: none"> <li>➤ Taluka level DMP to be updated</li> <li>➤ List of villages likely to be marooned to be maintained.</li> <li>➤ List of officers appointed for evacuation and maintenance of relief center to be kept.</li> <li>➤ Process early warning</li> </ul>	<ul style="list-style-type: none"> <li>➤ To disseminate the 1<sup>st</sup> cyclone warning by communicating it to local officers and village level workers and by beat of drum/loud speakers etc. in each village.</li> <li>➤ To take steps to serve orders of requisition of</li> </ul>	<ul style="list-style-type: none"> <li>➤ To call for Taluka level DM Committees to discuss the relief measures to be taken.</li> <li>➤ Local schools to be declared closed after instructions from Collector.</li> </ul>

	<p>dissemination to be firmed up.</p> <ul style="list-style-type: none"> <li>➤ The village wise list of persons to whome warning to be conveyed to be prepared.</li> <li>➤ List of place selected for feeding centers storerooms etc. to be kept ready.</li> <li>➤ Evacuation.</li> <li>➤ To arrange enumeration/assessment teams for preparation of checklist/panchanamas of damage for relief.</li> <li>➤ To arrange for removal of dead bodies etc.</li> <li>➤ To keep in touch with all department officers, Dy. Collector &amp; Collector office to proceed with relied operations.</li> <li>➤ To organize disaster response from civil society/NGOs in the affected areas.</li> </ul>	<p>services of employees.</p> <ul style="list-style-type: none"> <li>➤ To take steps to obtain the required No. of vehicles.</li> <li>➤ To contact the DCR frequently for instructions.</li> </ul>	<ul style="list-style-type: none"> <li>➤ To asses the loss of the life and property.</li> <li>➤ Teams for enumeration of houses damaged death of men and cattle in full details.</li> <li>➤ Relied camp management.</li> <li>➤ Disposal of carcasses.</li> </ul>
CE-PWD	<ul style="list-style-type: none"> <li>➤ Govt. building should be inspected and necessary repairs carried out.</li> <li>➤ All buildings identified as shelter/relief camps to be inspected and repaired.</li> </ul>	<ul style="list-style-type: none"> <li>➤ The 1<sup>st</sup> warning should be communicated immediately to all subordinate officers.</li> <li>➤ Deploy teams of labourers at all Fire Stations and DCR.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Clearing of roads for restoration of transport links.</li> <li>➤ Clearing of debris.</li> <li>➤ Photographs of damage should be taken. The field</li> </ul>

			staff
	<ul style="list-style-type: none"> <li>➤ Specific duties should be assigned to the field staff.</li> <li>➤ The field staff should proceed to the place of work allotted and is ready to attend to cyclone duty.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Alert the owner / contractors of JCBs, other heavy equipment.</li> </ul>	<ul style="list-style-type: none"> <li>➤ should convey.</li> <li>➤ Information regarding the quantum of loss of property.</li> </ul>
Director Transport /RTO	<ul style="list-style-type: none"> <li>➤ List of vehicles in running condition to be requisitioned kept ready.</li> <li>➤ The MVI/Asst. MVI will report before A.D.M.-I</li> </ul>	<ul style="list-style-type: none"> <li>➤ Availability if petrol, oils should be ensured.</li> <li>➤ The RTOs and MVIs should be asked to serve requisition orders on owners of vehicles for cyclone duty.</li> <li>➤ Provision of vehicles.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Deploy sufficient vehicles for relief work.</li> <li>➤ Safe returned of evacuees.</li> </ul>
Manager BSNL	<ul style="list-style-type: none"> <li>➤ Installation of Telephone lines to all officers connected with disaster management.</li> <li>➤ Proper maintenance of line of key officials/DCR/SCR/field CRs.</li> <li>➤ Appointing a Nodal Officer.</li> <li>➤ Constitutional of area wise quick response teams.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Inform all the filed level units to remain alert.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Restoration of lines of all CRs/Collectors /hospitals/fire station/SP-Police stations and other officials connected with Disaster Management.</li> </ul>

#### **4.6 Role of PSU/Private Sector:**

Past experience has revealed that many PSUs and private sector corporate houses have played a key role in the relief and rehabilitation effort to help the community recover from the deleterious effects of a disaster. In many cases entire villages have been adopted by the corporate houses and active steps have been taken for the reconstruction and rehabilitation of the lives and livelihoods of the survivors. Quite often, the response is very generous from different quarters but there is coordination lacking at the field level. To avoid any precious assistance from going waste due to ineffective organization, it is essential that district level liaison with the private sector and other agencies, is of a very high order

- For this purpose, ADM-I shall be appointed as the Nodal Officer to interact and liaise with any outside agency providing relief during a disaster.
- All the relief material from outside shall be first received at a central designated location (Azad Maidan/PHQ ground/ Campal ground).
- All the items of relief shall be properly enumerated and catalogued. For this purpose a special team under the charge of a Mamlatdar level officer shall be put in place.
- SP shall ensure proper security at the receipt location and also during transportation of relief materials.
- Based on the requirements, relief materials shall be dispatched from the central location in marked vehicle that will be given vouchers indicating the type/quantity and destination. The driver of the vehicle shall have the voucher counter-signed by the Zonal officer incharge of the affected area and submit the voucher to the DCR.
- Daily reports about the relief supplies received and dispatched to various locations shall be submitted to the Collector.

#### **4.7 Armed & Paramilitary Forces:**

- ❖ The service of Armed and Paramilitary forces shall be best utilized for immediate restoration of road communication and cleaning obstacles.
- ❖ To assist in rescue and evacuation of people and settlement in safer sites.

- ❖ To undertake the extrication of marooned people from the flood affected sites to safe shelters.
- ❖ To assess and identify alternative route for transportation of relief articles.
- ❖ To assist in maintaining law & order
- ❖ To assess and plan for argumentation of existing facilities/resources if needed.
- ❖ To help the various response groups in carrying out their activities in an organized manner.

4.8 **NGOs/CBOs/SHGs/Youth Clubs/NYK Groups/NSS:**

- ❖ Pre-Disaster Period:

<b><u>PREPAREDNESS</u></b>	
<ul style="list-style-type: none"> <li>➤ IEC campaign to create awareness in the community.</li> <li>➤ Preparation of Community Based DMPs.</li> <li>➤ Formation of village level Task forces on their expertise and specialization.</li> <li>➤ Capacity building of the Task Forces.</li> <li>➤ Specifying roles and responsibilities of the Task force members.</li> <li>➤ Generation of Community Contingency fund based on local contributions or donations.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Maintain transparency in their operations.</li> <li>➤ Constant liaison and coordination with District administration.</li> </ul>
<ul style="list-style-type: none"> <li>➤ Work closely with the community in identifying the high risk groups like elderly, disabled, children below 5 yrs. Pregnant/lactating women, ailing, single women etc.</li> <li>➤ Mock drills/simulations exercises for judging</li> </ul>	

the suitability of preparations.	
➤ Review and analyse past disasters.	

❖ **During Disaster Period:**

PREPAREDNESS	
<ul style="list-style-type: none"> <li>➤ To advise people to leave for identified safer places with their emergency kits.</li> <li>➤ Assisting in evacuation search and rescue people.</li> <li>➤ Escorting people to the shelters/relief camps.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Supplement and complement local administration efforts.</li> </ul>

❖ **Post Disaster Period:**

<b><u>PREPAREDNESS</u></b>	
<ul style="list-style-type: none"> <li>➤ to administer/assist in relief Administration</li> <li>➤ Arrangement of free Kitchen</li> <li>➤ Supply o safe drinking water</li> <li>Disposal of debris and carcasses</li> </ul>	<ul style="list-style-type: none"> <li>➤ Coordination with district/Taluka Administration.</li> </ul>
<ul style="list-style-type: none"> <li>➤ To watch &amp; ward belonging to evacuees.</li> <li>➤ Health care sanitation requirements of the evacuees.</li> <li>➤ Cooperate in road clearing activities to</li> </ul>	

<p>assist local relief work</p> <p>➤ Reconstruction and Rehabilitation activities in bringing normalcy to the lives of the affected people.</p>	
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## CHAPTER – 5

### CAPABILITY ANALYSIS

#### 5.1 INVENTORY AND EVALUATION OF RESOURCES

One of the most significant components of any DDMP is the accurate and comprehensive inventorisation of the various resources available at the disposal of the district administration, especially those that are relevant to the response and mitigation of any disaster. It is essential that first of all a proper categorization of the resources/ equipments/ materials required to fight a disaster is made and then the quantity, quality and availability is assessed. The success of any administrative response to a disaster situation depends to a very large extent on the authenticity and fidelity of the inventory database with the field situation. In view of the same, it is also imperative that the database is updated at regular intervals and random cross-checks/mock-drills are undertaken to assess its credibility.

##### **1. Cyclone Shelters/ Relief Camps:**

Identification of pucca buildings/locations, which can serve as temporary shelters or relief camps in times of emergency is very important. There is a need to identify such shelters/camp sites at various levels like village, block and taluka level. Further, some selected mounds/elevated locations need to be identified for safe shelter during the time of floods. Similarly, several open fields are to be identified which can be used as Helipads at the time of need because during high floods, when the people in the marooned area cannot be easily approached by boats, air dropping of food packets would be necessary. The list of such shelters/relief camp locations identified taluka wise is placed at Annexure – VIII.

##### **2. Storage Facilities in the District:**

The location of godowns and other storage facilities for foodgrains and other utility items required during emergency is at Annexure-IV .

### **3. Fair Price Shop Network:**

The state of Goa is fortunate in having a wide network of Fair Price Shops (FPS) which can prove to be quite useful during emergency situations for running free kitchen facilities at the relief camps. The list of FPSs Taluka wise is at Annexure-VI.

### **4. Canoes/power boats in Government/Private Sector:**

For evacuation and search and rescue operations in flooded/water-logged areas, small boats like canoes and small-motorized boats play very critical role, since large boats, trawlers etc, due to their large displacement cannot enter the shallow flooded areas to rescue marooned people. The list of canoe and other boat owners in North Goa district is at Annexure-IX.

### **5. Labour Contractors:**

There is always heavy demand of manual labour in disaster-affected area for variety of tasks and it is essential that details of large labour contractors s kept handy for quick response. The list is at Annexure-XVIII.

### **6. Alternate Power Sources:**

It is common knowledge borne out by past experience that the first casualty after any disaster strike is the electricity lines, resulting in a shutdown of power supply. It is crucial that alternate powers sources are kept in readiness so that basic activities are not hampered. The details of DG Set hirers is at Annexure-XX.

### **6. Vehicle Position:**

List of various types of vehicles available in the government, primarily the PWD is enclosed at Annexure- XXIV which can be utilized for any emergency.

## **5.2 CAPABILITY ANALYSIS OF INSTITUTIONS AT DISTRICT LEVEL :-**

- All District level officers, Sub-Divisions and Talukas have been provided with Telephone connection, Fax Machine, Computers with peripherals, Vehicle, emergency lights/gas lights.
- All Police Stations/Out Posts have Telephone connection and VHF Communication facilities. The details are at Annexure –XIII.
- All Fire stations of the District are equipped with the following resources for search and rescue operations.

1. Water Tender	5. Multipurpose Fire Tender	9. Hydraulic Platform
2. Heavy Water Tender	6. Industrial fire Tender	10. Rescue Van
9. Crash Tender	7. Foam Tender	11. Mobile Pump Unit
10. Emergency Tender	8. Break Down Van	12. Ambulance

The details are at Annexure- XIV, XV & XVI

- The overall position of Health infrastructure in the district is placed at Annexure- X, XI & XII.

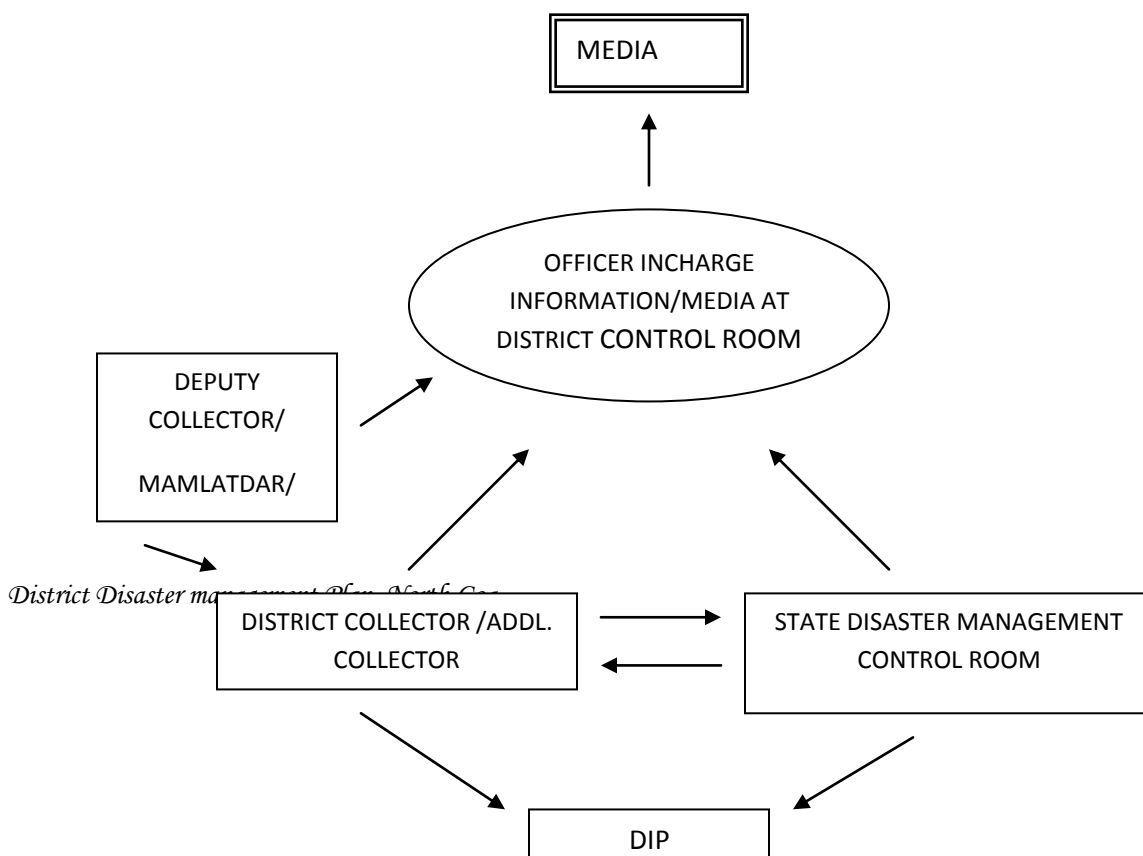
## **5.3 COMMUNICATION:**

It is well known that wireless and VHF are the quickest means of communication of weather warnings, emergency messages, and other information about floods etc. All the Police stations/out-posts are provided with VHF communication facilities. There is a need to connect all the Taluka headquarters with the District Collectorate by VHF facilities. However, landline telephone connections are available at the Taluka headquarters. In order to enhance the communication facilities from the field to the District Headquarters, the need to provide Mobile Telephones to all the Talukas warrants serious consideration.

## **5.4 MEDIA RELATIONS:**

The pivotal role of the media, print and audio-visual, in disaster preparedness as well as Disaster Management can be overlooked only at grave peril. The media can play a crucial role in disseminating important information about the disaster warnings, response strategies and mitigation measures and can

help aid the administration in preventing the spread of undue panic and rumour mongering. By providing right information to the target population at the right time, the media can be of immense support to the administration and it is essential that a streamlined system of information dissemination to the media players be devised. The following diagrammatic representation reflects the information flow process during disaster management.



## **SECTION – II: NON – STRUCTURAL**

### **CHAPTER – 6**

#### **DISASTERS IN NORTH GOA DISTRICT**

As far as Goa is concerned, two types of disasters are being experienced by this State i.e. 1) Natural Disaster like Earthquake, Floods / Heavy rains, Cyclones, Landslides, Tsunami and 2) Man made Disaster like Oil spill in the Sea / Land, Gas leakage, Explosives, Mine collapse, etc.

#### **1. Natural Disasters**

##### **a) Earthquake**

###### **a.1 Introduction.**

It may seem something of a revelation that the plates of the earth's crust are in slow but constant motion and innumerable earthquakes are registered around the world on the seismographs everyday. However the tremors are generally so small that they pass without being noticed. It is only when the magnitude around 5.0 or more on the Richter Scale that it is noticeable. With magnitude around 6.0 or more and hitting densely populated areas, these tremors assume apocalyptic proportions both on account of the suddenness or the shock and their mass destructive potential.

Although Goa has not witnessed earthquakes directly, the tremors of the devastating earthquakes with magnitude 5.0 or more that hit "Koyana" and "Latur" in Maharashtra in the year 1967 and 1993 respectively, affected the routine life of the

people in Goa as many of the residential as well as public structures, infrastructures were damaged severely, although no casualties were taken place.

## **a.2 Causes of Earthquake.**

The earth's crust is not one piece but consists of portions called plates, of varying sizes. These plates are not stable but move with three distinctive types of

movements along the boundaries of the plates.

- **Convergent Boundaries :** Where plates push each other and one plate slides down the other one.
- **Divergent Boundaries :** Where plates pull away from each other.
- **Transformed Boundaries :** Where plates slide past each other.

Due to continuous movement of the plates, stress accumulation takes place at the boundaries of these plates. When the stress accumulation reaches a point of maximum supportive strain, a rupture takes place generating an earthquake. The earthquakes generated this way are most damaging. Approximately 95 % of the earthquake activities occur at the plate boundaries. Some earthquakes, however, do occur in the middle of the plates, possibly indicating where earlier plate boundaries might have been. The point of rupture is called the focus.

The intensity of shaking at any place is related to the amount of energy released, the focal depth, distance of the place from the focus and the structural properties of the rock or soil on the surface. Some earthquakes are associated with volcanic activities as well.

### **a.3 Measures for Earthquake Risk Reduction.**

Various measures can be classified in terms of preparedness, mitigation and prevention in the pre-earthquake phase. These are immediate rescue and relief measures including temporary sheltering from just after an earthquake event to about 3 months; and reconstruction measures in the next six months to a three year period following an earthquake occurrence.

Earthquakes are hazards that strike without warning and cause widespread damage to various man-made structures and systems. These can neither be prevented nor predicted in terms of their magnitude, place and time of occurrence. Therefore, the most effective measures of risk reduction are pre-disaster mitigation, preparedness and preventive measures for reducing the vulnerability of the built environment and expeditious effective rescue and relief actions immediately after the occurrence of the earthquake. The measures can also be divided into long term, medium term and short term. The long term measures requires five to fifteen years, the medium term one to five years and the short term to be taken up immediately in high risk areas. It may be stated at this juncture that earthquakes don't kill people, buildings do. Therefore, most importantly, reduction of vulnerability of buildings and structure will be the key to earthquake risk reduction. Also, pre-disaster preparedness through a 'post-earthquake response plan' including training of the concerned personnel in various tasks is considered essential for immediate and effective response after an earthquake occurrence. The major action points are highlighted in the following paragraphs.

#### ***Pre Disaster Preventive Measures :***

**Long term measures :-** Various activities taken up as long term measures for earthquake disaster mitigation may include :

- Re-framing the building codes, guidelines, manuals and bye-laws and their proper implementation. Stricter legislation for highly seismic areas, in this regard.
- In high-risk areas, all buildings should incorporate earthquake resistant features.
- Public utilities like water supply system, communication network, electricity lines etc. Must be earthquake proof to reduce damage to the infrastructure facilities, alternative arrangement for the same must be developed.
- Community buildings and buildings used for gathering of large number of persons, like school, dharamshalas, hospitals, prayer halls, etc. must be made earthquake resistant in seismic zones of moderate to higher intensities.
- Supporting R&D in various aspects of disaster mitigation, preparedness and prevention and post-disaster management.
- Improving educational curricula in architecture and engineering institutions and technical training in polytechnics and schools to include disaster related topics.

**Medium term measures :-** The medium term measures for earthquake disaster mitigation may be listed as follows :

- Retrofitting of the weak structures in the highly seismic zones.
- Preparation of literature in local languages with do's and don'ts for the building constructions.
- Getting community involved in the process of disaster mitigation by providing them proper education and awareness.
- Supporting local technical institutions / colleges / school to conduct research and to organise research and to organise exhibitions etc. for public awareness.
- Networking of local NGOs working in the area of disaster management.

***Post Disaster Preventive Measures :***

**Short term measures :-** The urgent measures to be undertaken in the aftermath of a damaging earthquake will include the following :

- Maintenance of law and order, prevention of trespassing, looting etc.
- Evacuation of people.
- Recovery of dead bodies and their disposal.
- Medical care for injured.
- Supply of food and drinking water.
- Temporary shelters like tents, metal sheds, etc.
- Restoring lines of communication and information.
- Restoring transport routes.
- Quick assessment of damage and demarcation of damaged areas according to grade of damage.
- Condoning off severely damaged structures that are liable to collapse during aftershocks.

Co-ordination between various agencies involved in rescue and relief work is extremely important for success in avoiding gaps and duplication, Pre-disaster preparedness needs to be based on preparing likely damage scenario in probable earthquake occurrences and the estimate of extent of efforts required. The following preparedness actions will be useful :

- Community should be trained in search, rescue and relief at the time of disaster in high-risk areas.
- An extensive programme of mass drills may be very helpful in high risk areas for earthquake damage reduction.
- Local NGOs should be trained and their capacity and capabilities should be strengthened.
- Introducing earthquake disaster safety do's and don'ts and drills in schools.

- To organise training of field personnel of the states in the science and art of carrying out post disaster damage surveys, (a) for urgent relief purposes, (b) for repair, reconstruction and retrofitting purposes.

### ***Consolidation and reconstruction***

An effort needs to be made in the emergency phase, to involve the affected people to the maximum extent so as to create a feeling of self-reliance. They need to be started as quickly as possible so that the period of relief is minimised.

- Detailed survey of building for assessment of damage and decision regarding repair, reconstruction and strengthening or demolition.
- Repair, reconstruction and seismic strengthening or demolition.
- Selection of sites for new settlements, if required.
- Execution of the reconstruction programme.
- Review of the existing seismic zoning maps and risk maps.
- Review of seismic codes and norms of construction.
- Training of personnel, engineers, architects, builders and masons.
- Statistical studies regarding the earthquake.

## **b) Floods / Heavy rains**

### **b.1 Introduction.**

Of the annual rainfall, 75 % is received during four months of monsoon ( June – September) and as a result, almost all the rivers carry heavy discharge during this period. The Flood hazard is compounded by the problems of sediment deposition, drainage congestion and synchronisation of river floods with sea tides in the Coastal Plains.

As far as North Goa District is concerned, there are 3 main rivers viz. Terekhol, Chapora and Mandovi, besides one minor river Baga. The river Mandovi has 10 tributaries viz. Madei, Surla, Kotrachi, Ragda, Khandepar, Kudnem, Valvanta, Bicholim, Assonora and Sinker. This District had not experienced by major floods in past few years, except in 2000 at Bicholim; 2005 at Mala, Panaji and Bicholim and in 2007 also in Bicholim due to overflowing of rivulet, causing no major casualties but causing heavy damages to the properties.

## **b.2 Causes of Floods**

Flooding conditions may occur due to :

- Rivers in spate,
- Storm surges
- Short intense storms causing flash floods

Flooding in rivers is mainly caused by :

- Inadequate capacity within the banks of the river to contain high flows.
- River bank erosion and silting of riverbeds.
- Landslides leading to obstruction of flow and change in the river course.
- Synchronisation of flood in the main and tributary rivers.
- Flow retardation due to tidal and backwater effects.
- Poor natural drainage.
- Cyclone and heavy rainfall.

## **b.3 Types of Floods**

## ***Storm Surge***

Floods in coastal areas and in river estuaries are usually due to storm surges, which result from sea being driven onto the land by meteorological forces. Here two physical phases act together. A storm with intense low pressure causes the level of sea to rise because of barometric effects and strong winds associated with this storm, if directed on shore, drive the sea on the land. Storm surges are thus commonly associated with the tropical cyclones. The storm that produces the surge can also give rise to heavy rainfall in land so that the estuary region can be subject simultaneously to river flooding and storm surge.

## ***Flash Floods***

Flash floods are defined as floods of short duration with a relatively high peak discharge. They rise from local precipitation of extremely high intensity, typical of thunderstorms. The high concentration of rainfall on a small area can have a devastating effect as the river flow can rise to several hundred times the normal flow in the space of a few hours. Flash floods are common in arid and semi-arid areas. In these areas, what little rainfall there is usually occurs in short, intense storms. The intensity of the storms and the poor absorptive capacity of arid zone soils lead to much of the annual runoff occurring as Flash Floods.

### **b.4 Flood Disaster Management**

The various measures adopted for flood mitigation may be categorised into two groups :

- (i) Structural
- (ii) Non-Structural

The general approach was aimed at preventing floodwaters from reaching the potential damage centres, as a result of which a large number of embankments came up along the various flood prone rivers. The main thrust of the flood protection programme needs to be undertaken in this District, so far in the form of structural measures may be grouped into the following :

- Dams and Reservoirs
- Embankments, flood walls, sea wall
- Natural detention basin
- Channel improvement
- Drainage improvement
- Diversion of flood waters.

For effective functioning of all the physical measures taken, it is necessary that pre – and post–monsoon checks must be made and special repairs must be carried out prior to flood period.

The non – structural measures, on the other hand, aim at modifying the susceptibility to flood damage as well as modifying the loss burden. The various non – structural measures needs to be implemented in this District are :

- (i) Modifying the susceptibility to flood damages through :
  - Flood plain management
  - Flood proofing including disaster preparedness, and response planning and
  - Flood forecasting and Warning
- (ii) Modifying the flood loss burden through :
  - Disaster Relief
  
  - Flood fighting including Public Health Measures

Setting up of flood forecasting and warning services is one of the most cost effective non – structural measures available.

### b.5 Flood and Drainage Management

EMERGENCY SUPPORT FUNCTION	REQUIREMENTS	DEPARTMENT RESPONSIBLE
1) Communication Warn people against areas that are likely to get flooded. Assess damage to communication facilities.	VSATs, battery charged communication equipment	i) Water Resources Department ii) Police Deptt.
2) Public Health and Sanitation Assess the advent of infectious diseases Warn people of special measures against epidemics Special care for waterborne disease and epidemic outbreaks Distribute chlorine tablets Ensure purity of drinking water, free from contamination Provide drugs and medications for water borne diseases.	Specialised medical team to handle epidemics, cases of drowning , and water borne diseases.	i) Director of Health Services. ii) Public Work Deptt. iii) Directorate of Fire & Emergency services.
3) Power Damage to electric poles and stations etc., due to flooding Short circuiting measures Restore facilities at local and State level	Inventory of power installations of the area	Electricity Deptt.
4) Transport Provide boats as a means of transport	Inventory of transport / water way facilities in the area	Corporation of City of Panaji.
5) Donation Compile information on specific needs of the people. Distribute donations by means of air dropping and boats to marooned victims.	Socio-economic needs Cultural needs	Mamlatdar / Deputy Collector / B.D.O.

6) Search and Rescue Aerial survey for marooned victims	Deep sea divers S & R boats Equipments cache	Police Department / Fire & Emergency / Corporation of City of Panaji.
7) Public Works and Engineering Clear areas for relief camps Clear roads for easy access Seal areas and buildings that are likely to cause further damage Build temporary bridges for ease of access.	Specialised equipments for functioning in flood prone areas inventory Specialised equipments for bridges and other temporary structures	C.O.P. / P.W.D. / W.R.D. / Fire & Emergency.
8) Food Provide food packs that contain dry and non-perishable food items	Inventory of non-perishable food items	Directorate of Civil Supplies and
9) Information and Planning Release flood related information to all ESF Provide access to resource inventories and document all situations-reports and procedures.	Disk net All Inventories	Directorate of Information and Publicity.
10) Relief Supplies Provide basic logistic materials required for local administration Provide relief materials such as batteries, flash lights to victims / rescue workers.	Inventory of relief supplies.	P.W.D. / W.R.D. / Directorate of Civil Supplies.
11) Drinking water Provide clean drinking water Place shelters in a safe area Shelters should adhere to the climatic conditions of the area.	Inventory of water sources of the area.	P.W.D.
12) Shelter Provide weather resistant shelter Place shelters in a safe area. Shelters should adhere to the climatic conditions of the area	Inventory of specific type of shelter for cyclones and floods	Mamlatdar / Deputy Collectors / B.D.O.s
13) Media Information on current status		Directorate of Inf. & Publicity.

14) Helplines Provide information on marooned victims and hospitals Receive messages for victims and forward them to relatives outside disaster area Provide emergency phone lines	Inventory of emergency phone numbers	District Control Room  Police Control Room  DIP
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## **b.6 District Contingency Plan Action Points : Floods**

### ***Pre – Flood Arrangements :***

- Convening a Meeting of the District Level Committee on Natural Calamities;
- Functioning of the Control rooms;
- Closure of past breaches in river and canal embankments and guarding of weak points;
- Rain – recording and submission of rainfall reports;
- Communication of gauge – readings and preparation of maps and charts;
- Dissemination of weather reports and flood bulletins issued by the meteorological Centres, Central Water Commission, Flood Forecasting Organisation;
- Deployment of boats at strategic points;
- Use of power boats;
- Installation of temporary Police Wireless Station and temporary telephones in flood – prone areas;
- Arrangement for keeping telephone and telegraph lines in order;
- Storage of food in interior, vulnerable strategic and key areas;
- Arrangements of dry food stuff and other necessities of life;
- Arrangements for keeping the drainage system desilted and properly maintained;
- Health measures;
- Veterinary measures;
- Selection of flood shelters;
- Advance arrangements for army assistance;
- Training in flood relief work;

- Organisation of relief parties;
- Other precautionary measures; and
- Alternative drinking water supply arrangements.

### ***Arrangements During And After Floods :***

#### **Organising rescue operations.**

- Organising shelter for the people in distress in case the efforts of the civil authorities are considered inadequate, Army assistance should be requisitioned.
- Relief measures by non-official and voluntary organisations may be enlisted as far as possible.
- Organise relief camps.
- Provision of basic amenities like drinking water, sanitation and public health care and arrangements of cooked food in the relief camps.
- Making necessary arrangements for air dropping of food packets in the marooned villages through helicopters.
- Organising enough relief parties to the rescue of the marooned people within a reasonable time limit.
- Establish alternate communication links to have effective communication with marooned areas.
- Organising controlled kitchens to supply foods initially at least for 3 days.
- Organising cattle camps, if necessary, and provide veterinary care, fodder and cattle feed to the affected animals.
- Grant of emergency relief to all the affected people.
- Submission of daily reports and disseminate correct information through mass media to avoid rumours.
- Rehabilitation of homeless.
- Commencement of agricultural activities / desiltation, resowing.

- Repairs and reconstruction of infrastructure facilities such as roads, embankments, resettlement of flood prone areas.
- Health measures.
- Relief for economic reconstruction.

It may seem something of a revelation that the plates of the earth's crust are in slow but constant motion and innumerable earthquakes are registered around the world.

#### **b.7 Area Prone to Floods in North Goa District :**

As far as North Goa District is concerned, Bicholim and Sattari Talukas are mainly affected due to floods due to River Valvonti, whereas the other Talukas of Tiswadi, Bardez, Pernem and Ponda are flooded either due to low lying areas or due to temporary rise in water level of nearby rivulets. The details of the talukawise villagers / area flooded have been specified in Annexure – VII appended hereto.

### **c) Cyclone**

#### **c.1 Introduction :**

Cyclones are the most destructive of the seasonally recurring rapid onset natural hazards. Between 80 to 100 cyclones occur around the world each year. Cyclones are the progeny of ocean and atmosphere, powered by the heat from the sea, driven by the easterly trades and temperate westerly, the high planetary winds and their own fierce energy. As a combined result the ocean develops devastating surge, inundating vast coastal areas. Devastation in violent winds, torrential rainfall and accompanying phenomenon including storm surges and floods can lead to massive community disruption.

## **c.2 Characteristics of Cyclone :**

Cyclones are characterised by destructive winds, storm surges and exceptional levels of rainfall which may cause flooding :

i) Destructive winds : The strong winds that blow counter-clockwise, whilst spiralling inwards and increasing towards the cyclone centre is highly destructive. Winds speeds progressively increase towards the core. As the eye arrives, winds decrease to become almost calm but rise again just as quickly as the eye passes and are replaced by Hurricane force winds from a direction nearly the reverse of those previously blowing.

ii) Storm Surges : The Storm surge defined as the rise in sea levels above the normally predicted astronomical tide, is frequently a key or overriding factor in a tropical disaster. The major factors include.

- A fall in the atmospheric pressure over the sea surface.
- The effect of the sea bed
- A funnelling effect
- The angle and speed at which the storm approaches the coast
- The tides.

iii) Exceptional rainfall occurrence : The very high specific humidity condenses into exceptionally large raindrops and giant cumulus clouds, resulting in high precipitation rates. When a cyclone makes landfall, the rain rapidly saturates the catchment areas and the rapid runoff may extensively flood the usual water sources or create new ones.

## **c. 3 Causes of cyclone :**

i) Formation and initial development : Four atmospheric and oceanic conditions are necessary for development of a cyclonic storm :

- **A warm sea temperature** in excess of 26° C to a depth of 60 m, which provides abundant water vapour in the air by evaporation.
- **High Relative Humidity** of the atmosphere to a height of above 7000 m facilitates condensation of water vapour into water droplets and clouds, releases heat energy thereby inducing a drop in pressure.
- **Atmospheric instability** encourages formation of massive vertical cumulus cloud convection with condensation of rising air over ocean.
- **A location of at least 4 – 5 Lat. Degree from the Equator** allows the influence of the forces due to the earth's rotation to take effect in reducing cyclonic wind circulation around low pressure centres.

ii) Mature Cyclones : As viewed by weather satellites and radar imagery the main physical feature of a mature cyclone is a spiral pattern of highly turbulent giant cumulus thunder cloud bands. These bands spiral inwards and form a dense highly active central cloud core which wraps around a relatively calm and cloud free 'eye'. The eye has a diameter of from 20 – 60 Km of light winds and looks like a black hole or dot surrounded by white clouds. In contrast to the light wind conditions in the eye, the turbulent cloud formation extending outwards from the eye accompany winds of up to 250 kph, sufficient to destroy or severely damaged most non-engineered structures in the affected communities.

iii) Modification of decay : A cyclone begins to weaken in terms of its central low pressure, internal warm core and extremely high winds as soon as its source of warm moist air begins to ebb or are abruptly cut off. The weakening of a cyclone does not mean the danger to life and property is over. When the cyclone hits land, especially over mountainous or hilly terrain, riverine and flash flooding may last for weeks.

### **c.3 Early Warning System :**

As far as North Goa District is concerned, Cyclone Disaster Warning System has been installed in the Police Headquarters which plays an important role in alerting the people / State authorities for taking preventive measures at the time cyclone warning issued by India Meteorology Department (IMD).

As and when cyclone is likely to affect Goa, the Area Cyclone Warning Centre, Mumbai gives first message called Cyclone alert 48 hrs. before, followed by another message in 24 hrs. or more frequently till the dewarning message is sent.

### **d) Landslides**

#### **d.1 Introduction:**

Landslides are simply defined as the mass movement of rock, debris or earth down a slope and have come to include a broad range of motions whereby falling, sliding and flowing under the influence of gravity dislodges earth material. Landslides along with other sudden and short lived phenomena such as earthquakes, volcanic eruptions, flood and hurricanes can be grouped into catastrophic or disaster phenomena.

These are one of the exogene processes that produce extra ordinary terrain changes during the time they last.

When landslides endanger humans and their installation, they are known as hazards; when they cause property damage and loss of life, they are disasters.

Landslides are ubiquitous and occur in all climates on most hilly terrains, and in

lakes and oceans. Some rocks are more landslides resistant than others, but regolith is likely to be landslide prone.

Various authors in many ways have defined the term landslide. But in general, a landslide may be defined as a process involving downward and outward movement of a part of slope forming material along a definite plane i.e. plane of failure. It is caused due to shear failure along this plane.

#### d.2 Incidences of Landslides in Goa :

Sr.No.	Taluka	Location	Severity of Landslide
1	Tiswadi	Aradi, St. Cruz.	Low
2	Bardez	Nerul	Low
3		Malim, Betim	Low
4		Gaunswada, Mapusa	Low
5		Alto Betim, Mapusa – Panaji NH-17, Near Mandovi Bridge.	High
6		Pernem	Vaidongor,

The landslides specified at 1 to 4 and 6 above were of low nature as far as the severity is concerned. In this cases, some boulders had slid down towards the residential structures / school buildings thereby causing severe damages to the structures.

However, the landslide that took place on Mapusa – Panaji NH-17 during the monsoon, 2007 was of high severity as the vehicular traffic on this road was obstructed almost for a month.

Landslide Zonation Mapping is a modern method to identify landslide prone areas and has been in use in India since 1980s.

The major parameters that call for evaluation are as follows :

- Slope – Magnitude, Length and Direction
- Soil thickness
- Relative relief
- Landuse
- Drainage – pattern and density
- Landslide affected population

#### **d.2 Causes of Landslides :**

Landslides can be caused by poor ground conditions, geomorphic phenomena, natural physical forces and quite often due to heavy spells of rainfall coupled with impeded drainage.

#### **A checklist of causes of Landslides**

1	<u>Ground Causes</u> <ol style="list-style-type: none"><li>1. Weak, sensitivity or weathered materials</li><li>2. Adverse ground structure (joints, fissures, etc.)</li><li>3. Physical property variation (permeability, plasticity, etc. )</li></ol>
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2	<p><u>Morphological Causes</u></p> <ol style="list-style-type: none"> <li>1. Ground uplift (Volcanic, tectonic, etc. )</li> <li>2. Erosion (wind, water )</li> <li>3. Scour</li> <li>4. Deposition loading in the slope crest</li> <li>5. Vegetation removal (by forest fire, drought, etc. )</li> </ol>
3	<p><u>Physical Causes</u></p> <ol style="list-style-type: none"> <li>1. Prolonged precepitation</li> <li>2. Rapid draw – down</li> <li>3. Earthquake</li> <li>4. Volcanic eruption</li> <li>5. Thawing</li> <li>6. Shrink and swell</li> <li>7. Artesian pressure</li> </ol>
4	<p><u>Man – made Causes</u></p> <ol style="list-style-type: none"> <li>1. Excavation (particularly at the toe of slope )</li> <li>2. Loading of slope crest</li> <li>3. Draw – down (of reservoir )</li> <li>4. Deforestation</li> <li>5. Irrigation</li> <li>6. Mining</li> <li>7. Artificial vibrations</li> <li>8. Water impoundment and leakage from utilities.</li> </ol>

**e) Tsunami**










## **e.1 Tsunami in North Goa District :**

As far as the North Goa District is concerned, the coastal belt was not recorded any Tsunami in the past. However, the Tsunami of 26th December, 2004 in the Bay of Bengal had caused after effects in the sea and rivers. No loss of lives or damages to the properties were reported, except some vessels in the sea were reported to have been damaged.

## **B. Man made Disasters**

### **a. Industrial and Chemical disasters:**

The Industrial Hazards do not have clear definition. The disasters are the result of:

-  Accident
-  Failure
-  Mishap/Misuse of technology
-  Leakages
-  Spills
-  Radiation fallout
-  Explosions and fires
-  Structural failure
-  Transportation mishaps (Road, Air, Rail, Shipping and Pipelines)

### **Major chemical hazards in Goa:**

- ✚ Hazards at port terminals
- ✚ Hazards due to leakage or pilferage and sabotage to conveying pipe
- ✚ On-site emergencies at the process units
- ✚ Hazards posed by improper transportation and accidents involving carriers
- ✚ Accidents involving aircraft and ships
- ✚ Accidents involving goods trains transporting hazardous material

**Major accident hazard units:**

1. Goa Glass Fibre – Colvale (Other chemicals)
2. Filpack Pvt. Ltd., Pilerne (LPG)
3. Hindustan Petroleum, Kundaim (LPG)
4. Esteem Industries, Pissurlem (Other chemicals)
5. Syngenta, Corlim (Chlorine)
6. Finolex Essex, Usgaon (Other chemicals)
7. Venus Ethoxyethers Pvt. Ltd., Bicholim (Other chemicals)

**Action contemplated to reduce hazards:**

- It is proposed to involve Civil Society Organizations in the dissemination of knowledge, precautions and coping up with disasters.
- Need for safety audit by introducing a single inspection system.
- Continuous professional development of all regulating agencies in bi-annual cycles.
- Acquisition of PPE & HAZMAT appliance and other supporting equipments.

**b. Oil Spill in the Sea / Land :**

No major incidents of oil spillage were reported in North Goa District, except in the year 2005, such incident had taken place on 23/03/2005 due to spillage of oil from M/V. Maritime Wisdom anchored at Panaji Port and as a result the beaches at Vagator, Anjuna, Baga, Calangute, Candolim and Sinquerim were polluted, thereby posing danger to the Marine life beach goers. However, preventive measures were taken by the Captain of Ports with the assistance of Coastal Guards.

**PREVENTION AND RESPONSE STRATEGIES**

**7.1 PARAMETERS FOR PLANNING STRATEGIES:**

To prepare effective and comprehensive prevention and response strategies to manage any disaster situation, it is very essential that the basic parameters/planning assumptions are carefully enumerated and analysed. These assumptions/ parameters serve as a beacon in the formulation of smart and implementable response strategies. An indicative list of parameters to be borne in mind for various authorities at the district level is as follows:

**District Collector & Chairman DDMA:**

- Proper and round-the-clock functioning of DCR.
- Closure of breaches and fortification of bunds/embankments to be ensured.
- Boats/canoes/power boats to be deployed.
- Requirement of vehicles (LMV/HMV/Buses) to be assessed and list kept handy.
- All vulnerable areas to be identified.
- All shelters/ relief camps/ air dropping zones etc to be identified and publicized.
- Alternate routes and transportation/ resource arrangements to likely cut-off areas to be planned.
- Senior Level Officers should be deployed before the areas get cut off.
- List of all Nodal Officers with contact address and numbers to be firmed up.
- Storage of food (Baby food, dry food) in vulnerable pockets to be monitored.
- Arrangements for immediate evacuation and S & R operations to be reviewed.
- Relief measures to be organized.
- Large amounts of information will flow into the DCR- proper receipt, transmission, compilation, analysis and recording of the relevant information.
- There can be protocol and law & order problems while handling VVIP visits.
- Proper flow of authentic information flow to the media and maintaining of excellent PR.
- Coordination with NGOs/CBOs and other civil society partners.
- Army/paramilitary force assistance to be alerted.

**Superintendent of Police (SP):**

- There can be communication problems.
- There can be law and order situation in the affected areas.

- Routes might be blocked with carcasses/fallen trees.
- There will be traffic jams on the roads.
- Coordination with CPMFs and Armed Forces may be required.
- Possibility of law and order problems during VVIP visits.

**DHS:**

- There may be shortage of medicines/life saving drugs in the affected areas.
- There may be outbreak of epidemic or other medical emergency during/after the disaster.
- Contamination of water and food, requirement of adequate drugs and medical accessories.
- Location and operationalisation of medical camps/ emergency units.
- The number of dead/seriously injured is beyond the capacity of local hospitals. · Disruption of communication and transport facilities.
- Disruption of labs and hospitals and damage to medicine storage sites.
- Disruption of sanitation facilities.
- Loss of power and missing people in shelters may increase disease and injury.
- Requirement of psychological counseling for Post Traumatic Stress disorders in the survivors.

**PWD-PHE:**

- Most of the water available in the affected areas may be unfit for drinking.
- Existing storage bodies of water may be damaged and unusable.
- There will be an alternative need (poly packs) of water to assist survivors in rescue operation.
- Tankers and containers to be acquired for distribution of water.
- Sources of potable water sources and unacceptable water sources (for washing etc) to be identified.
- Water to be distributed to camps and hospitals.
- Normal transportation facilities may be affected due to disaster.

Taking into consideration, inter alia, the above mentioned planning assumptions, prevention and response strategies to be followed to handle any disaster situation especially floods and cyclones in North Goa district have been categorized into 4 broad time zones viz:-

S. No.	Response period
1	Pre-Disaster Period
2	Immediate Pre-Disaster Period

3	During Disaster
4	Post Disaster Period

## 7.2 PRE – DISASTER PERIOD:

PREPARATION	OBJECTIVE	ACTION
Meeting of DDMA – before 15th of April every year.	<ul style="list-style-type: none"> <li>➤ To make an assessment of the precautionary measures to be undertaken by various departments especially WRD, Civil Supplies, PWD, Panchayats, DMA, Police, Fire services etc.</li> <li>➤ To ensure that the Preparatory and precautionary works are executed in a time bound manner .</li> <li>➤ Prepare the DCR.</li> </ul>	<ul style="list-style-type: none"> <li>• Collector &amp; Chairman DDMA.</li> <li>• All HODs</li> </ul>

Identification of vulnerable points in all river systems.	<ul style="list-style-type: none"> <li>➤ Fortification of embankments/bunds etc.</li> <li>➤ Repairing of breaches.</li> <li>➤ Stocking of the sand bags.</li> </ul> <p>Alerting people near highly vulnerable areas.</p>	<ul style="list-style-type: none"> <li>• CE-WRD</li> <li>• Dy. Collectos &amp; Mamlatdars (Reporting &amp; Monitoring)</li> <li>CE-PWD</li> </ul>
Identification & indent of essential commodities the inaccessible/scarcity pockets.	<ul style="list-style-type: none"> <li>➤ Stocking of food grains</li> </ul>	<ul style="list-style-type: none"> <li>• Dy. Collectors &amp; Mamlatdars</li> <li>• Director Civil Supplies.</li> </ul>

Update inventory of Power Boats & Canoes.	<ul style="list-style-type: none"> <li>➤ To ensure easy and swift deployment of boats for Search, Rescue and Relief operation in the affected areas.</li> </ul>	<ul style="list-style-type: none"> <li>• Dy Collectors &amp; Mamlatdars.</li> <li>• COP.</li> <li>• Director Fisheries.</li> </ul>
Identification of shelter/Relief camp sites.	<ul style="list-style-type: none"> <li>➤ Awareness amongst about the location of the recamps identified. lief the public</li> <li>➤ Connecting Road Maps.</li> <li>➤ Provision of basic facilities like drinking water, sanitation etc.</li> </ul>	<ul style="list-style-type: none"> <li>• Deputy Collectors / Mamlatdars.</li> <li>• Director Education. · CE-PWD</li> </ul>
Assessment of Health infrastructure and adequacy for emergency response.	<ul style="list-style-type: none"> <li>➤ Stocking of necessary medicines and life saving drugs in the PHCs/UHCs at the vulnerable locations.</li> <li>➤ Formation of Quick Response Medical Teams (QRMT) for each location.</li> <li>➤ Ensure that each QRMT has a well defined staff and vehicle.</li> </ul>	<ul style="list-style-type: none"> <li>• D.H.S.</li> </ul>

Arrangement of Food and fodder for bovine population.	<ul style="list-style-type: none"> <li>➤ Stocking of the same.</li> </ul>	<ul style="list-style-type: none"> <li>• DAHVS.</li> </ul>
Check the communication network.	<ul style="list-style-type: none"> <li>➤ Test-check wireless/VHF systems between the headquarters and the field units</li> <li>➤ Ensure necessary repairs and upgradation.</li> </ul>	<ul style="list-style-type: none"> <li>• Police/DySP Wireless.</li> </ul>
Monitoring.	<ul style="list-style-type: none"> <li>➤ To take stock of overall situation</li> </ul>	<ul style="list-style-type: none"> <li>• District Collector.</li> </ul>

### 7.3 IMMEDIATE PRE – DISASTER:-

PREPARATION	OBJECTIVE	ACTION
<p>Receipt of disaster Early Warning.</p> <ul style="list-style-type: none"> <li>➤ From CR/Police /Fire Control Room.</li> <li>➤ News Bulletin of AIR &amp; DD</li> <li>➤ Weather warning from IMD/Coast Guard</li> <li>➤ From internet etc.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Swift dissemination of information to all Field level officers, HODs and line departments.</li> </ul>	<ul style="list-style-type: none"> <li>• DCR</li> <li>• Police Control Room.</li> <li>• Fire Services</li> <li>• Control Rooms of Talukas.</li> </ul>
<p>Immediate setting up and operationalisation of round-the-clock DCR.</p>	<ul style="list-style-type: none"> <li>➤ Overall coordination, execution and monitoring of the disaster response.</li> </ul>	<ul style="list-style-type: none"> <li>• District Collector.</li> <li>• Addl Collector.</li> <li>• All Dy Collectors / Mamlatdars.</li> <li>• All HODs of line departments.</li> </ul>
<p>Search, Rescue and evacuation.</p>	<ul style="list-style-type: none"> <li>➤ To undertake preemptive evacuation.</li> <li>➤ To undertake S &amp; R Operations to locate marooned people in the affected areas and to shift them to the shelter locations. Logistic arrangements for the shelters</li> </ul>	<p>Police personnel, Fire Services, Home Guards, CPMF/Armed Forces (if required), NGOs, Village volunteer groups, COP, Dir Transport. ·</p> <p>Addl. Collector-I Dy Collectors, Mamlatdars</p>
<p>Shelter management.</p>	<ul style="list-style-type: none"> <li>➤ To provide immediate relief and shelter to the survivors.</li> <li>➤ Provision of food, drinking water, mats etc.</li> <li>➤ Basic sanitation facilities.</li> <li>➤ Health care and medical camps</li> </ul>	<p>Dy Collector/ Mamlatdars.</p> <ul style="list-style-type: none"> <li>· DCS.</li> <li>· NGOs/CBOs.</li> <li>· CE-PWD.</li> <li>· DHS.</li> </ul>

		Dir Panchayats/ DMA-Local Bodies. NSS/NCC.
<p>Transportation:</p> <ul style="list-style-type: none"> <li>➤ Requisition of sufficient members of vehicle, Light/Medium/Heavy</li> <li>➤ Immediately freezing of 75% stock of POL bunkers/Oil companies.</li> <li>➤ Direct EE Fovt. Garage to ration POL to various vehicles.</li> </ul>	<ul style="list-style-type: none"> <li>➤ For rapid deployment in affected areas.</li> <li>➤ Ensure sufficient POL.</li> <li>➤ To ensure adequate POL for disaster management.</li> </ul>	<p>Collector.</p> <ul style="list-style-type: none"> <li>· Director Transport/MDKTC.</li> <li>· Dy Collectors/Mamlatdars.</li> <li>· RTOs.</li> </ul>
Arrangement of Power saws/ labourers etc.	<ul style="list-style-type: none"> <li>➤ To clear the road, Cut the fallen trees and remove the debris.</li> </ul>	<p>Director Fire Services.</p> <ul style="list-style-type: none"> <li>· PWD.</li> <li>· Local Bodies.</li> </ul>
Arrangement of DG and trucks.sets	<ul style="list-style-type: none"> <li>➤ To move to the field immediately after the disaste is over to ensure basic power supply.</li> </ul>	<p>PWD.</p> <p>Director Fire Services</p>

#### **7.4 DURING DISASTER:**

PREPARATION	OBJECTIVE	ACTION
Remain alert for further warnings and updates on the situation.	<ul style="list-style-type: none"> <li>• Remain in readiness to gear up in action immediately after the initials threat is over.</li> </ul>	<p>DCR/ Police &amp; Fire CRs/ Taluka CRs.</p> <p>District Collector.</p> <p>All HODs</p>
DCR to operate 24 hrs.	<ul style="list-style-type: none"> <li>• Listing all messages received from time to time and timely dispatch.</li> </ul>	<p>DCR ·</p> <p>All Line Dept.</p> <p>·All Dy Collectors, /Mamlatdars</p>

Continuous Monitoring.	<ul style="list-style-type: none"> <li>To assess the overall scenario.</li> </ul>	District Collector. Dy.Collectors,/Mamlatdars
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#### 7.5 POST – DISASTER:

<b>FOLLOW UP ACTION</b>	<b>OBJECTIVE</b>	<b>ACTION</b>
Search and Rescue operations in the affected areas	To locate marooned people and escort them to safety.	Director Fire/ SP. ·Deputy Collector,Mamlatdar Other NGOs/ CBOand civil society. NSS/NCC.
<p>Launch immediate Relief operation:</p> <ul style="list-style-type: none"> <li>➤ Operationalisation of the Relief camps at designated locations.</li> <li>➤ Proper shelter /camp management.</li> <li>➤ Distribution of Relief/ Emergent Relief as per the provisions of CRF/GSDMS.</li> <li>➤ Monitoring Relief Operation organized by outside agencies like UN Agencies/Red Cross/ NGOs/PSUs/ other states etc. through District Administration.</li> </ul>	<ul style="list-style-type: none"> <li>• To provide immediate shelter, food, drinking water and sanitation facilities to the evacuated/rescued people.</li> <li>• Provision of health care facilities to the people.</li> <li>• To maintain uniformity of Relief operation.</li> <li>• To avoid duplication of effort and resources.</li> </ul>	Deputy Collector, Mamlatdar CE-PWD DHS Other NGOs/CBOs and Civil society. NSS/NCC
Special care to Children, Pregnant and Lactating Mothers, Old & infirm.	<ul style="list-style-type: none"> <li>• To ensure adequate care and protection to the special needs of these vulnerable groups</li> <li>• To instill confidence in the</li> </ul>	DHS. ·Director (Women & Child Development).  Director (Social Welfare )

	people about the sensitivity and concern of the administration towards subjective needs.	Dy Collectors/Mamlatdars. NGOs/ Civil Society.
Restoration of infrastructure: ➤ Communication Roads & Railways. Electronic communication system.	<ul style="list-style-type: none"> <li>• For timely and prompt delivery /transportation of relief articles/ deployment of rescue team.</li> <li>• To ensure proper coordination linkage</li> </ul>	PWD, SP, CPMF/Armed Forces(if required). S.P./ DySP (Wireless). BSNL.
Ensuring transportation of Relief Materials to affected pockets.	<ul style="list-style-type: none"> <li>• To reach, at the earliest possible, after abatement of calamity to assuage the affected people and instill confidence in the administration</li> </ul>	Dy Collectors/mamlatdars Director Transport/MDKTC/ RTO. PWD/ Civil Supplies.
Deployment of Police forces for maintenance of Law and Order	<ul style="list-style-type: none"> <li>• To safeguard the property/belongings of the evacuees.</li> <li>• To prevent anti-social activities.</li> <li>• Prevent looting/ sabotage of relief materials.</li> <li>• Ensure peace and harmony at the relief camp sites.</li> </ul>	<ul style="list-style-type: none"> <li>• SP.</li> <li>• DG Home Guards.</li> <li>• Dy. Collectors/ Mamlatdar</li> <li>• NGOs /CBOs, and village volunteers etc.</li> </ul>
Removal of Debris & Disposal of carcasses	<ul style="list-style-type: none"> <li>• To prevent outbreak of epidemics &amp; maintain general hygiene in the area</li> </ul>	<ul style="list-style-type: none"> <li>• SP/director of fire Service</li> <li>• DMA/ Dir. Panchayat/Local bodies.</li> </ul>

	<ul style="list-style-type: none"> <li>• Spraying and. Fumigation in the affected area</li> </ul>	<ul style="list-style-type: none"> <li>• PWD</li> <li>• DHS/DAHVS</li> </ul>
<p>Helping the evacuees to return to their home &amp; hearth</p> <ul style="list-style-type: none"> <li>➤ Ensure adequate transportation facilities</li> <li>➤ Ensure that proper preventive measure have been taken for outbreak of diseases.</li> <li>➤ Ensure emergency relief as per the provision GSDMS has been provided</li> <li>➤ Ensure adequate deployment of Police</li> </ul>	<ul style="list-style-type: none"> <li>• Return and settlement of the evacuees with their belonging after normalcy.</li> <li>• Prevent any law and order problems in the initial vulnerable period.</li> <li>• To enable affected person to restart their livelihood.</li> </ul>	<ul style="list-style-type: none"> <li>• Dy. Collectors/Mamlatdars</li> <li>• SP.</li> <li>• DHS</li> <li>• Local Bodies</li> <li>• NGOs/Civil Society.</li> </ul>
<p>Protocol and management of VIP visits</p> <ul style="list-style-type: none"> <li>➤ A special team for protocol under charge of Addl. Collector-I/II.</li> <li>➤ Daily compilation of information and updation at 6 hrs. intervals.</li> <li>➤ Deployment of Police escort team/vehicle with VIP and also in the areas to be toured</li> </ul>	<ul style="list-style-type: none"> <li>• To ensure that no glaring faux pas in Protocol takes place.</li> <li>• To present correct picture and authentic date to the dignitaries.</li> <li>• To ensure law &amp; order</li> </ul>	<ul style="list-style-type: none"> <li>• Collector/Addl. Collector-I/II, Dy. Collector in-charge of Protocol</li> <li>• DCR/Field CRs.</li> <li>• SP</li> </ul>

<p>Overall Monitoring of the situation and assessment of additional resources.</p> <ul style="list-style-type: none"> <li>➤ Sector-wise additional resources required</li> <li>➤ Coordination linkages with NGOs/CBOs outside agencies for relief and rehab</li> </ul>	<ul style="list-style-type: none"> <li>• To takes stock of the day to day administrative response and sort out bottlenecks for proper implementation of relief/restoration/rehabilitation effort.</li> </ul>	<ul style="list-style-type: none"> <li>• District Collector</li> </ul>
<p>Meeting Officer both District and Field level, every 24 hours (if possible) to take review the effort.</p>	<ul style="list-style-type: none"> <li>• For effective coordination amongst all line departments involved in relief operation and to ascertain the progress thereof.</li> </ul>	<ul style="list-style-type: none"> <li>• District Collector</li> <li>• Dy. Collector/Mamlatdar at Sub Divisional/taluka level.</li> </ul>
<p>Information flow.</p> <ul style="list-style-type: none"> <li>➤ Collection and compilation of information in DCR.</li> <li>➤ Submission of daily situation report to Govt. through district Collector</li> <li>➤ Maintain liaison with field and state govt.</li> </ul>	<ul style="list-style-type: none"> <li>• 3 Dimensional linkage between filed, District and State Control Room and other State level officials for taking regular review and monitoring initiating corrective measures, if required.</li> </ul>	<ul style="list-style-type: none"> <li>• Collector/Addl. Collector-I</li> <li>• Dy. Collectors/Mamlatdar</li> <li>• SCR</li> </ul>
<p>Assessment of Damage</p>	<ul style="list-style-type: none"> <li>• To ascertain the exact loss in each sector- loss of life/loss of property/loss of infrastructure/loss of Agriculture/environmental</li> </ul>	<ul style="list-style-type: none"> <li>• Dy. Collectors/Mamlatdars</li> <li>• ZAO as far as crop damages concerned</li> <li>• All line Depts.</li> </ul>

	loss etc. for projection before govt.	
Documentation of entire events/Black & white/Audio & Video	<ul style="list-style-type: none"> <li>• To apprise the situation to different Central/State level dignitaries</li> <li>• To enable thorough post mortem of administrative response and effort</li> <li>• To understand the achievement and failures</li> <li>• To incorporate ways and means of improving the strategies based on experience.</li> <li>• To maintain institutional memory.</li> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>• Collector</li> <li>• Dy. Collectors/Mamlatdars</li> <li>• Line Departments</li> <li>• DIP</li> </ul>

## RESPONSE PLAN

In line with the Guidelines on the Incident Response System (IRS) as issued by the National Disaster Management Authority (NDMA) under section 6 of the DM Act, 2005 is being introduced as the response plan. Only the salient points of the District IRS are presented here. For the detailed guidelines the State IRS shall be referred and the same should be maintained in the District Emergency Operation Centers and District control Rooms. The District IRT has been formed and is presented in Appendix 1.

### 8.1 Response Structure during Warning Stage

At district level, before the occurrence of disaster and immediately after the disaster, the district administration will activate the district control room so that proper information will be provided to the concerned authorities.

### 8.2 Incident Response System (IRS)

#### **8.2.1. Purpose**

The main purpose of these Guidelines is to lay down the roles and responsibilities of different functionaries and stakeholders, at State and District levels and how coordination with the multi-tiered institutional mechanisms at the National, State and District level will be done. It also emphasizes the need for proper documentation of various activities for better planning, accountability and analysis. It will also help new responders to immediately get a comprehensive picture of the situation and go in for immediate action.

#### **8.2.2. IRS Organisation**

The IRS organisation functions through Incident Response Teams (IRTs) in the field. In line with the administrative structure and DM Act 2005, Responsible Officers (ROs) have been designated at the State and District level as overall in charge of the incident response management. The RO may however delegate responsibilities to the Incident Commander (IC), who in turn will manage the incident through IRTs. The IRTs will be pre-designated at all levels; State, District, Sub-

Division and Tehsil/Block. On receipt of Early Warning, the RO will activate them. In case a disaster occurs without any warning, the local IRT will respond and contact RO for further support, if required. A Nodal Officer (NO) has to be designated for proper coordination between the District, State and National level in activating air support for response whenever required.

Apart from the RO and Nodal Officer (NO), the IRS has two main components; a) Command Staff and b) General Staff. The structure is shown in Fig. 1.

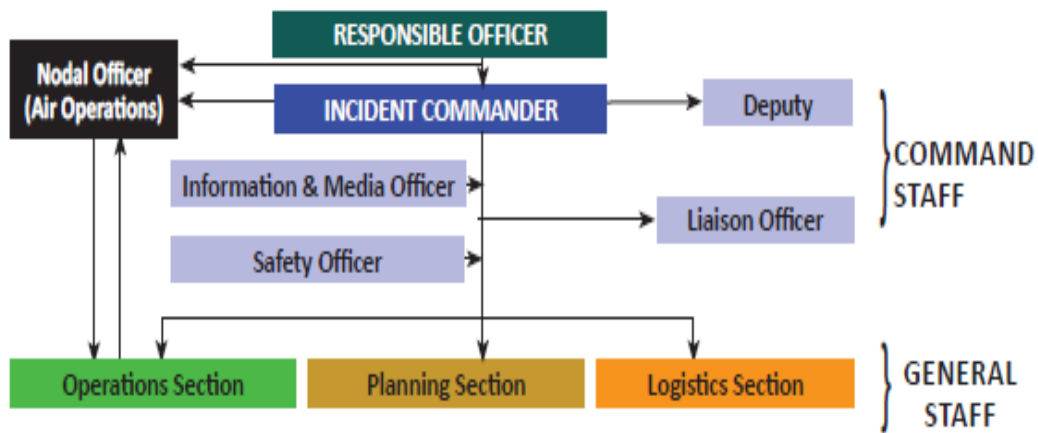


Fig. 1. IRS Organization

### 6.2.2.1. Command Staff

The Command Staff consists of Incident Commander (IC), Information & Media Officer (IMO), Safety Officer (SO) and Liaison Officer (LO). They report directly to the IC and may have assistants.

### 8.2.2.2. General Staff

The General Staff has three components which are as follows;

#### Operations Section (OS)

The OS is responsible for directing the required tactical actions to meet incident objectives. Management of disaster may not immediately require activation of Branch, Division and Group. Expansion of the OS depends on the enormity of the situation and number of different types and kinds of functional Groups required in the response management.

#### Planning Section (PS)

The PS is responsible for collection, evaluation and display of incident information, maintaining and tracking resources, preparing the Incident Action Plan (IAP) and other necessary incident related documentation. They will assess the requirement of additional resources, propose from where it can be mobilized and keep IC informed. This Section also prepares the demobilization plan.

#### Logistics Section (LS)

The LS is responsible for providing facilities, services, materials, equipment and other resources in support of the incident response. The Section Chief participates in development and implementation of the IAP, activates and supervises Branches and Units of his section. In order to ensure prompt and smooth procurement and supply of resources as per financial rules, the Finance Branch has been included in the LS.

### 8.2.3. Features of IRS

#### 8.2.3.1. Common Terminology

In IRS, common terminology is applied to Organisational Elements, Position Titles, Resources and Facilities which are as follows.

- a) **Organisational Elements:** There is a consistent pattern for designating each level of the organisation (e.g., Sections, Branches, Divisions and Units etc).
- b) **Position Titles:** Those charged with management or leadership responsibility in IRS are referred to by specific position titles such as Commander, Officer, Chief, Director, Supervisor, Leader, in-charge etc. It provides a standardised nomenclature for requisitioning personnel to fill various levels of positions.
- c) **Branch:** The organizational level having functional or geographic responsibility for major segments of incident operations. The Branch is found in Operations and Logistics Sections. It is based on various functional requirement of the Section.

- d) **Division:** Divisions are used to divide an incident into geographical area of operations. It is positioned in the IRS organization between the Branch and Groups. Divisions are established when number of resources deployed exceeds the span of control of the Operations Sections Chief. It is also activated for closer supervision when an area is very distant or isolated.
- e) **Group:** Group refers to only functional responsibilities for major segments of Incident operations. Group consists of different functional teams (Single Resource, Strike Team and Task Force).
- f) **Resources:** Resources are grouped into two categories: i) Primary and ii) Support. The Primary resources are meant for the responder and support resources are meant for the affected people. All resources are however designated according to the 'kind' and 'type'. 'Kind' would mean the overall description of the resource like Bus, Truck, Bulldozer, Medical Team. 'Type' would mean the performance capability of the resource which may be large, medium or small. This helps in ordering the exact and correct resource by the ordering unit. It also helps the deploying agencies to send the correct requirement.
- g) **Facilities:** Different kinds of facilities have to be established to meet the specific needs of the incident. IRS tries to standardise them by using common terminology like Incident Command Post, Staging Area, Incident Base, Camp, Relief Camp, Helibase, Helipad, etc. The details of facilities and its symbols are provided in chapter 3 at paras 3.15.1, 3.15.3, 3.15.4, 3.15.5, 3.15.8 and in chapter 6 at paras 6.2.1, 6.4.4.3. of the State IRS report.

#### 8.2.3.9. Accountability

Accountability of personnel and resources are ensured through use of various forms as suggested in the NDMA Guideline on IRS. The various procedures and forms in the IRS are as follows.

- a) **Incident Briefing – Form 001** helps in briefing everyone involved in the response activities. It also helps new responders to immediately get a complete view of status of response. It shows map of affected site, summary of current action, status of activated IRS organisation and resource summary.
- b) **Incident Status Summary (ISS) – Form 002** indicates the status of the tasks assigned, completed or still to be completed. It also has details of the weather conditions and other threats that may increase the severity of the incident.
- c) **Unit Log – Form 003** is a complete performance report of the IRT down to the different Sections, Branches, Groups indicating their locations and details of work assigned along with resources and the status of work done etc. The details of this information for the Unit Log will be obtained from the "Record of Performed Activities – Form 004".
- d) **Record of Performed Activities – Form 004** will be available with every responder under different Sections and will be a complete account of the activities performed during the concerned operational period. The information collected through this form will be compiled by OS and maintained in the Unit Log - Form 003.
- e) **Organisation Assignment List – Form 005** helps in performing the task in a focused manner. After preparation of the IAP in the briefing meeting, the IC and the different Section Chiefs will ensure that the activities required to be performed is listed in the form 005 and circulated among all the

concerned responders and supervisory staff of different Sections respectively. It will be like a check list in a particular operational period that helps responders to respond in a comprehensive and focused manner.

- f) **Incident Check-in and Deployment List – Form 006** helps to keep track of resources received at different facilities and dispatched to various incident site for response. This list will be maintained by the managers/in-charges of all the facilities that are set up for response.
- g) **On Duty Officers List – Form 007** the list contains details of the officers who have been deployed. It will be maintained at the Section level and sent to the RO through the IC. The list will help the RO and IC to easily locate officers and issue directions to them.
- h) **Medical Plan – Form 008** will be prepared by Medical Unit of the LS in accordance with IAP. This will contain the number of medical aid camps activated in various locations of affected sites, resources available; i) medical officer, ii) paramedics, iii) other volunteers, iv) lifesaving drugs, v) medicines / appliances, vi) list of referral services and blood banks, vii) availability and mobilization of ambulance services and viii) list of Government and private establishments for further support, etc.
- i) **Incident Communication Plan – Form 009** helps to provide a complete picture of the already existing, available communication facilities and where new facilities have to be setup for disaster response. It gives details of the type of communications available, the source of their power supply and whether alternative arrangements are available or not. The plan will also have a design for networking of inter organization communications facilities of the Police, NDRF, Armed Forces, and Irrigation Department etc. keeping in mind the conflicting codes that may be in use. Because of the large number and variety of sets and possibility of heavy communication traffic, a number of nets may have to be established like command net, operational net, logistics net and ground to air net. It will also help in working out the requirement of supervision, maintenance, replacement, repair and transportation for the maintenance of communication facilities.
- j) **Demobilization Plan – Form 010** will be prepared by the PS in consultation with IC and other Section Chiefs. It will have to be approved by the RO and widely circulated in advance. It has often been experienced that because of lack of a proper demobilization plan and a lack of its proper dissemination, resources (men and machines) mobilized for disaster response face difficulties in availing transportation while returning. Demobilization plan therefore is very important. It is equally important that everyone among the responders must know the date and time they have to move and what will be the modality of their movement.

Formats of all Forms are given in the Annexure I.

### **8.2.3.2. Resource Management**

Resources are managed and assigned under specific terminology to denote their employability. The terms used are as follows;

- a) **Resource Status:** Tactical resources assigned to an incident will always be in any one of the following

four status conditions.

- **Required:** Resources that would be needed to respond to disasters effectively and which need to be obtained;
- **Available:** Resources ready for deployment in the staging area;
- **Assigned:** Resources on active assignment; and
- **Out-of-Service:** Resources not assigned or not available because of repair or maintenance.

*(The resource status is maintained by the PS)*

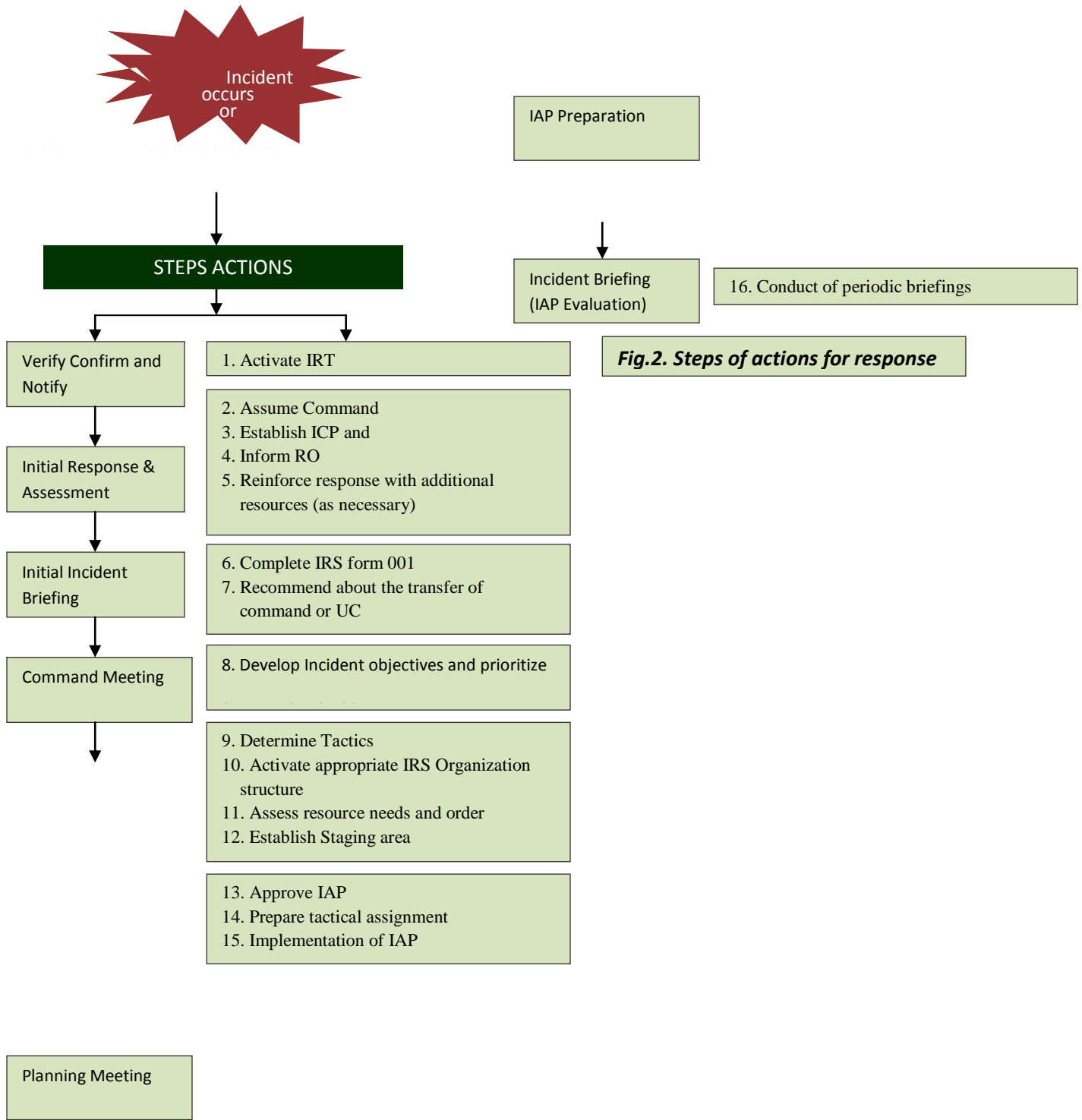
- b) **Single Resource:** Single Resource includes both personnel and their equipment.
- c) **Strike Team:** A Strike Team is a specified combination of a designated number of the same 'kind' and 'type' of resources with common communications and a leader. Strike Teams can be pre-designated or assembled at an incident site from the available Single Resources as per demand of the situation.
- d) **Task Force:** A Task Force is any combination of Single Resource of different 'kinds' and 'types' within the ambit of a specific span of control to perform different types of functions simultaneously. They are assembled for a multi-tactical task in a particular location with common communications and a leader. Task Forces can be pre-determined or assembled for response in an incident site from available Single Resources according to the requirement.

### **8.2.3.3. The Incident Action Plan (IAP), Briefing and Debriefing Meetings**

Management of every incident needs an action plan and proper briefing of all personnel. The purpose of the action plan and briefing is to provide all concerned personnel with appropriate directions for the various tasks in hand. Before taking up response activities, the RO/IC will need to take stock of the situation, availability and mobilization of resources for listing out the various tasks and to provide proper briefing to the responders. For this, he will need to hold a proper briefing meeting at the beginning of each operational period. At the end of the operational period, a debriefing meeting is equally important where he will be able to again review whether the objectives were achieved or not and then decide what further steps need to be taken in the next operational period. Both the briefing and debriefing meetings are the basis on which the IAP will be prepared and tasks assigned. For the convenience of the IC, a briefing form - 001 as suggested in NDMA guideline. The briefing form - 001 can also be used for briefing of senior officers who arrive on the scene.

In certain circumstances when important developments take place and further immediate Intervention is needed in-between the briefing & debriefing meetings, the IC may issue directions even before completion of one operational period.





**Fig.2. Steps of actions for response**

IAP can be written or oral depending on the duration and magnitude of the incident. The incident may be of low, medium or large levels. Low level incident would be of less than 24 hours, medium would be of more than 24 hours and less than 36 hours and a large incident would be of more than 36 hours of emergency operations. In low or medium level incidents, oral action plan may suffice. The directions given orally may be jotted down by the Command Staff and handed over to the PS to be integrated in the IAP.

At times there may be sudden disasters without warning and the IC may have to respond immediately. In such cases also the Command Staff will jot down the decisions taken for response and hand it over to the PS when it is activated and it should be incorporated in the IAP. In larger incidents when there is adequate early warning, a written IAP will be required. IAP may consist of incident objectives, organization assignment and division assignment list, incident communication plan, traffic plan, safety plan and incident map etc. Details of the IAP are given in the Planning Section, 7.1 of the State IRS report.

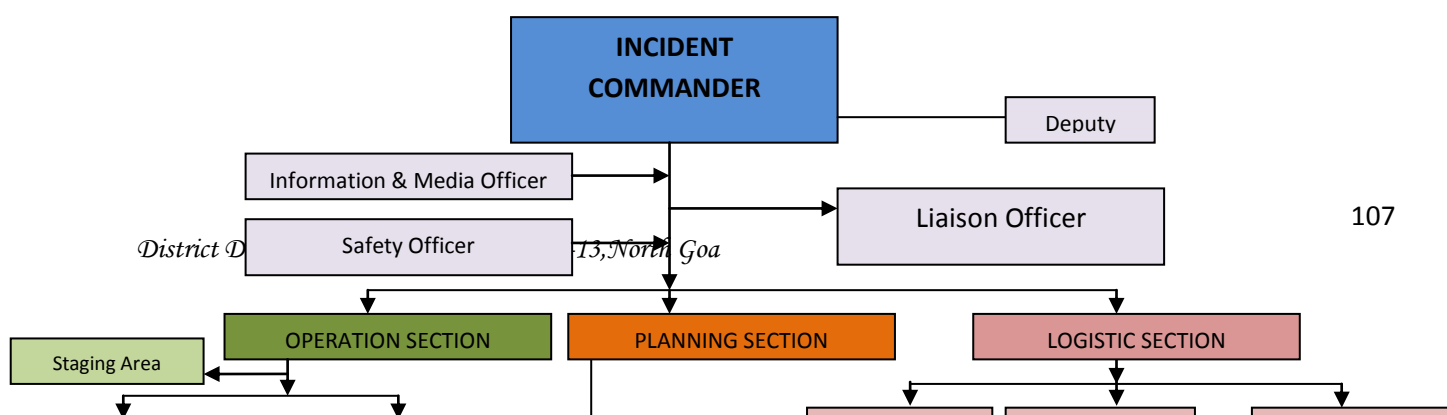
### **8.2.4. The Incident Response Teams (IRTs) at State , District and Tehsil/Taluka Levels**

The IRT is a team comprising of all positions of IRS organization as shown in Fig. 3 headed by IC. The OS helps to prepare different tactical operations as required. The PS helps in obtaining different information and preparing plans as required. The LS assesses the availability and requirement of resources and takes action for obtaining them.

IRTs will function at State, District, Sub-Division and the Tehsil / Taluka levels. These teams will respond to all natural and man-made disasters.

The lowest administrative unit (Sub-Division, Tehsil or Village Panchayat) will be the first responder as the case may be. If the incident becomes complex and is beyond the control of local IRT, the higher level IRT will be informed and they will take over the response management. In such cases the lower level IRT will merge with higher level IRT.

When a lower level of IRT (e.g. Tehsil) merges with a higher level (e.g. Sub-Division, District or State) the role of IC of lower level of IRT will change. When the Block level IRT merges with Sub-Division level IRT, IC of the Block level may play the role of Deputy IC or OSC or any other duty that the IC of higher authority assigns. This process will be applicable at all levels. The District/Sub-Division/Tehsil or Taluka Level Incident Response Team has been formed and the same is given in the Appendix.



### **8.2.5 Triggering Mechanism for Deployment of IRT**

Some of the natural hazards have a well-established early warning system. District also has a functional 24 x 7 EOC / Control Room. On receipt of information regarding the impending disaster, the EOC will inform the RO, who in turn will activate the required IRT and mobilise resources. The scale of their deployment will depend on the magnitude of the incident.

At times the information about an incident may be received only on its occurrence without any warning. In such cases the local IRT (Sub-Division, Tehsil) as the case may be, will respond and inform the higher authority and if required seek reinforcement and guidance.

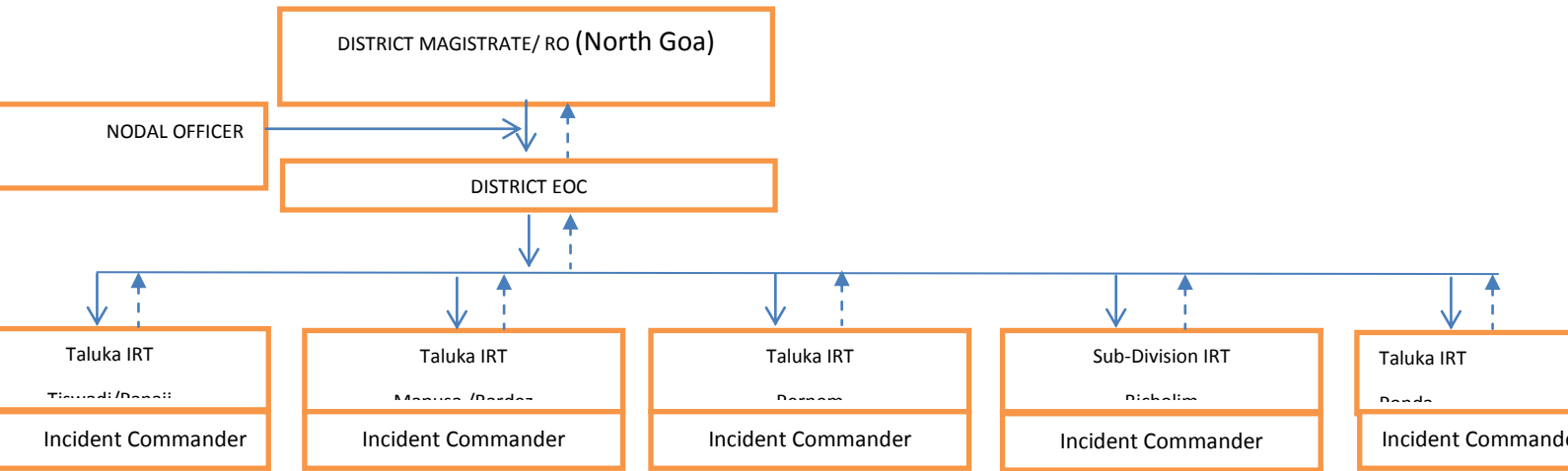
The measures decided to be taken for response will be jotted down by the Command Staff and later handed over to PS. It will thus form the initial IAP.

### **8.2.6. Coordination of Response at the District / Sub-division/ Taluka Level**

The District Magistrate/DC is the head of the District administrative set up and chairperson of the

DDMA as per the DM Act, 2005 He has been designated as the RO in the District.

## District Level



**Fig.4 IRTs at District Level (North Goa)**

Note: In case of Sub-divisions; Panaji , Mapusa, Pernem and Ponda location of Sub-divisional office and Taluka office are same. It is suggested that respective Mamlatdars of these Talukas will act as Incident Commander and the respective Sub-divisional Officers will play the role of Responsible officer.

## Sub-Divisional / Taluka Level

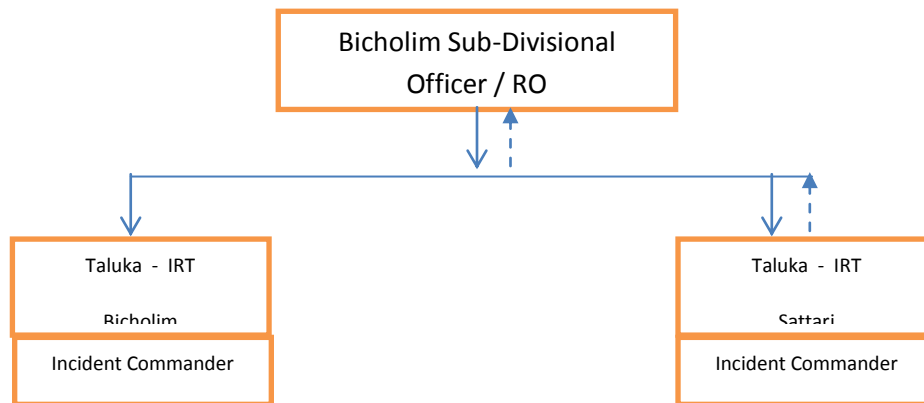


Fig. 5- IRTs at Tehsil/Taluka level

Note: At Block level/ Village Panchayat level there is no IRT. The Village Panchayat Disaster Management Committee will discharge the responsibility through various taskforces as indicated in the respective Village Panchayat Disaster Management Plan.

## 8.3 Roles and Responsibilities of the Key IRS Positions

The major responsibilities of the key positions of IRS are given below. For the detailed level reports the State level IRS shall be referred.

### **8.3.1. Roles and Responsibilities of District Magistrate as RO**

#### ***The District Magistrate / RO will:***

- i. Ensure that IRTs are formed at District, Sub-Division, Tehsil/Block levels and IRS is integrated in the District DM Plan as per Section 31 of the DM Act, 2005. This may be achieved by issuing a Standing Order by the RO to all SDOs, SDMs and Tehsildars/BDOs;
- ii. Ensure web based / on line Decision Support System (DSS) is in place in EOC and connected with Sub-Division and Tehsil / Block level IRTs for support;
- iii. Ensure that toll free emergency numbers existing for Police, Fire and Medical support etc. are linked to the EOC for response, command and control. For e.g., if there is any fire incident, the information should not only reach the fire station but also the EOC and the nearest hospital to gear up the emergency medical service;
- iv. Obtain funds from State Government as recommended by the 13th FC (Annexure – XVI) and ensure that a training calendar for IRTs of District is prepared and members of IRTs are trained through ATIs and other training institutions of the District;
- v. delegate authorities to the IC;
- vi. Activate IRTs at District headquarter, Sub-Division, Tehsil / Block levels, as and when required;
- vii. Appoint / deploy, terminate and demobilize IC and IRT(s) as and when required;
- viii. Decide overall incident objectives, priorities and ensure that various objectives do not conflict with each other;
- ix. Ensure that IAP is prepared by the IC and implemented;
  - x. remain fully briefed on the IAP and its implementation ;
  - xi. Coordinate all response activities;
  - xii. give directions for the release and use of resources available with any department of the Government, Local Authority, private sector etc. in the District;
- xiii. ensure that local Armed Forces Commanders are involved in the planning process and their resources are appropriately dovetailed, if required;
- xiv. ensure that when Armed Forces arrive in support for disaster response, their logistic requirements like camping grounds, potable water, electricity and requirement of vehicles etc. are sorted out;
- xv. appoint a NO at the District level to organise Air Operations in coordination with the State and Central Government NO. Also ensure that all ICs of IRTs of the District are aware of it;

- xvi. ensure that the NGOs carry out their activities in an equitable and non-discriminatory manner;
- xvii. deploy the District Headquarter IRTs at the incident site, in case of need;
- xviii. ensure that effective communications are in place;
- xix. ensure that telephone directory of all ESF is prepared and available with EOC and members of IRTs;
- xx. ensure provision for accountability of personnel and a safe operating environment;
- xxi. in case the situation deteriorates, the RO may assume the role of the IC and may seek support from the State level RO;
- xxii. mobilise experts and consultants in the relevant fields to advise and assist as he may deem necessary;
- xxiii. procure exclusive or preferential use of amenities from any authority or person;
- xxiv. conduct post response review on performance of IRTs and take appropriate steps to improve performance; and
- xxv. take other necessary action as the situation demands.

### **8.3.2. Roles and Responsibilities of IC**

***The IC will:***

- i. obtain information on:
  - a) situation status like number of people and the area affected etc.;
  - b) availability and procurement of resources;
  - c) requirement of facilities like ICP, Staging Area, Incident Base, Camp, Relief Camp, etc.;
  - d) availability and requirements of Communication system;
  - e) future weather behavior from IMD; and
  - f) any other information required for response from all available sources and analyze the situation.
- ii. determine incident objectives and strategies based on the available information and resources;
- iii. establish immediate priorities, including search & rescue and relief distribution strategies;
- iv. assess requirements for maintenance of law and order, traffic etc. if any at the incident site, and make arrangements with help of the local police;
- v. brief higher authorities about the situation as per incident briefing form - 001 enclosed in Annexure-I and request for additional resources, if required;
- vi. extend support for implementation of AC and UC if considered necessary by the RO;
- vii. establish appropriate IRS organisation with Sections, Branches, Divisions and/or Units based on the span of control and scale of the incident;
- viii. establish ICP at a suitable place. There will be one ICP even if the incident is multi-jurisdictional. Even a mobile van with complete communication equipment and appropriate personnel may be used as ICP. In case of total destruction of buildings, tents, or temporary shelters may be used. If appropriate or enough space is not

- available, other Sections can function from a different convenient location. But there should be proper and fail safe contact with the ICP in order to provide quick assistance;
- ix. ensure that the IAP is prepared;
  - x. ensure that team members are briefed on performance of various activities as per IAP;
  - xi. approve and authorise the implementation of an IAP and ensure that IAP is regularly developed and updated as per debriefing of IRT members. It will be reviewed every 24 hours and circulated to all concerned;
  - xii. ensure that planning meetings are held at regular intervals. The meetings will draw out an implementation strategy and IAP for effective incident response. The decision to hold this meeting is solely the responsibility of the IC. Apart from other members, ensure that PSC attend all briefing and debriefing meetings;
  - xiii. ensure that all Sections or Units are working as per IAP;
  - xiv. ensure that adequate safety measures for responders and affected communities are in place;
  - xv. ensure proper coordination between all Sections of the IRT, agencies working in the response activities and make sure that all conflicts are resolved;
  - xvi. ensure that computerized and web based IT solutions are used for planning, resource mobilization and deployment of trained IRT members;
  - xvii. consider requirement of resources, equipment which are not available in the functional jurisdiction, discuss with PSC and LSC and inform RO regarding their procurement;
  - xviii. approve and ensure that the required additional resources are procured and issued to the concerned Sections, Branches and Units etc. and are properly utilised. On completion of assigned work, the resources will be returned immediately for utilisation elsewhere or to the department concerned;
  - xix. if required, establish contact with PRIs, ULBs, CBOs, NGOs etc. and seek their cooperation in achieving the objectives of IAP and enlist their support to act as local guides in assisting the external rescue and relief teams;
  - xx. approve the deployment of volunteers and such other personnel and ensure that they follow the chain of command;
  - xxi. authorise release of information to the media;
  - xxii. ensure that the record of resources mobilised from outside is maintained so that prompt payment can be made for hired resources;
  - xxiii. ensure that Incident Status Summary (ISS) is completed and forwarded to the RO (IRS form-002 is enclosed at Annexure-II);
  - xxiv. recommend demobilisation of the IRT, when appropriate;
  - xxv. review public complaints and recommend suitable grievance redressal measures to the RO;
  - xxvi. ensure that the NGOs and other social organisations deployed in the affected sites are working properly and in an equitable manner;
  - xxvii. ensure preparation of After Action Report (AAR) prior to the demobilisation of the IRT on completion of the incident response.

- xxviii. perform any other duties that may be required for the management of the incident;
- xxix. ensure that the record of various activities performed (IRS Form-004 enclosed in Annexure-IV) by members of Branches, Divisions, Units/Groups are collected and maintained in the Unit Log (IRS Form-003) enclosed at Annexure-III;
- xxx. perform such other duties as assigned by RO.

### **8.3.3. Roles and Responsibilities of IC and RO at the Sub-Division and taluka Level**

The roles and responsibilities of Responsible Officer (RO) and Incidence Commander (IC) for Sub-Division and Taluka level will be same as that of District level as indicated in para 8.3.1 and 8.3.2 in their respective area of jurisdiction.

## **8.4. STANDARD OPERATING PROCEDURES**

## 8.4.1 Standard Operating Procedures

### Revenue Department

#### A. Normal Time Activities (Checklist)

- | A map of disaster prone areas in the district, history of the district, geographical conditions occupational details, settlements, rain, irrigation and industries etc.
- | Safe alternative routes to utilize during disaster in the disaster prone areas.
- | Key officers of all the departments, staff, vehicles and buildings.
- | Details of control room arrangement.
- | Details of geographical groups and assignment of Zonal Officer.
- | Details of food grain storage places in the district and the Fair Price Shops.
- | Details of vehicles, boats and equipments available in the district for rescue operation.
- | Setting up of communication to communicate the messages from village to village.
- | Details of operating systems for District Disaster Management Committee.
- | List of NGOs and self help groups and their addresses and phone numbers in the district in the prescribed annexure
- | Orientation Training to various District level officers and departments for effective functioning of control room, co-ordinations and operations.
- | Special appointments of persons in charge of control room.
- | Hazard analysis, seasons, and possibilities of disasters and review of disaster history.
- | Review of disaster prone areas, risks, response plan, resource and utility of resources and equipments.
- | Strategy for disaster management
- | To update the DDMP.
- | To check the condition of safe shelter during his visits in the district places and if necessary gets it repaired by co-coordinating with the local authorities, available financial resources and voluntary organizations.

- | Repairing of roads and ways leading to safe shelters by co-ordinating with various development plans/schemes.
- | Evacuation plan as a part of DDMP.
- | To undertake development projects like rural housing, scarcity of relief works, disposal of rainwater and water conservation and water harvesting.
- | To co-ordinate scheme for poverty eradication, self-employment and the schemes of other departments.

**B. On receiving the warning**

- | Will review the alarming situation in the meeting of DDMC.
- | Assigning the work as to what to be done by which officer in case the disaster hits.
- | Will review and have co-ordination task
  
- | Will alert and activate the functionaries' related to early warning and communication looking to the possibilities of disaster and will see that the messages are intimated to the members.
- | Distribution of work for operation of round the clock control room.
- | Will send the vehicles with mikes and sound system for the areas of top priorities.
- | Will instruct all the staff to remain present at their respective places.
- | Shifting the people living in low lying areas, seashores, and economically weaker people socially and economically backward families and houseless families to safe places.
- | Will workout the arrangements for search and rescue operation, shifting of people and utilization of human resources as per necessity with the help of DMTs and local community through zonal officers.
- | Will arrange for temporary shelter for the people evacuated by giving the warning in advance.
- | Will provide the vehicles to shift the people to the safer place when necessary.
- | Will undertake the operation of forceful evacuation of people if they are not ready to leave even after warning.
- | Will arrange for food, drinking water, medicines at temporary shelters and relief camps with the help of local NGOs, doctors, industrial houses, etc.
- | Will make in advance preparations for relief activities through local NGOs, industrial houses, and donors over and above normal norms of the relief.

Will work out the financial estimates for search and rescue and immediate relief.

### **C. Post Disaster Activities**

Will segregate the villagers and areas victimized by the disaster and activate the DMTs.

Will start relief activities including emergency relief distribution and work out the strategy of damage assessment and provide the formats for the same and explain to all the staff members.

Will guide the team members about the payments of relief accident to damage as per the rules and policies of the government before the start of duty.

Will make arrangements for the transportation and distribution of Govt. relief amount and materials.

Will make due arrangements to see that there should be no haphazard distribution of relief material so that needy people are not deprived of it.

Will arrange for drinking water and essential things at community kitchen / relief camps as per the necessity.

Will work out the primary estimates of the damage.

Will undertake the rescue operations to save the trapped people through DMTs trained police personnel and swimmers on need base.

Will requisite more vehicles for rescue work, shifting the people to temporary/permanent dispensary for treatment through DMTs, NCC, Home Guards, Local Police, and Para Military Forces etc.

Will arrange for identification of the people, who died, maintain the dead bodies till legal procedure is over.



## **Police Department**

### **A. Normal Time Activities**

The Superintendent of Police will co-ordinate the work of disaster management as nodal officer. He will prepare a separate and comprehensive plan of district regarding the department of police and also prepare details of resources as a part of DDMP. He will consider the following in it.

- | Details of contacts of all the staff members under the district.
- | Maps and statistical data of district areas.
- | Resources and human resources useful at the time of disaster.
- | Details of police staff and retired officers/staff of the police and the control room.
- | Details of functions of staff of the district control room.
- | Appointment of the nodal officer in the control room.
- | Traffic arrangements towards the disaster affected areas.
- | Details of anti social elements.
- | Security arrangements at relief camps and food storages.
- | Security for the transportation of the relief material.
- | Immediate police procedures for human death.
- | To assist the authorities for the evacuation of people from disaster affected areas.
- | Adequate equipments for communication.
- | List of swimmers.
- | Wireless stations in the district and communication network.
- | To update the related details of Disaster Management Plan.

### **B. On receiving the warning**

- | Will contact the district collector.
- | Make advance preparation to implement the action plan for search and rescue.

- | Will prepare a plan for police personnel for search and rescue.
- | Will arrange to communicate the messages through all the equipments of communication and vehicles as per the necessity.
- | Will requisite vehicles after obtaining the orders for the same from the district authorities.

**C. Post Disaster Activities**

- | Will arrange law and order against theft in the disaster affected area.
- | Will co-ordinate the search and rescue operation through NCC/VTF/NGO.
- | Will arrange for security at the relief camps/relief materials storages.
  
- | Will see the law and order is maintained at the time of distribution of relief material.
- | Will assist the authorities for evacuation of people to the safer places.
- | Will make due arrangements for post mortem of dead persons, and legal procedure for speedy disposal.

**Health Department**

**A. Normal Time Activities**

While preparing the DDMP / updating the same, the health department shall take care to include the following particulars carefully.

- | A separate plan for disaster management regarding health.
- | Arrangements for exchange of information in the control room.
- | Appointment of nodal officer.
- | Advance arrangements for life saving medicines, insecticides and vaccines.
- | Maintenance of vehicles such as ambulance, jeep and other equipments such as generators etc.
- | Distribution of work by forming groups of staff during emergency.
- | List of private practicing doctors / medical facilities.
- | Arrangement for survey of disaster.
- | Mobile dispensary units.
- | Information regarding proper places for on the spot medical services in various village during disaster.
- | Dissemination of information among the people regarding the death, injury.
- | Primary information of disaster related relief activities to all the staff members.
- | Training to PHC / Community Health Centre staff to prevent spreading of diseases among the people, animals, and advance planning for the same.
- | Blood group wise list of blood donors with contact telephone numbers and addresses.
- | Training of DMTs regarding first aid.
- | To prepare an action plan for the availability of equipments to be useful at the time of disaster management for medical treatment.
- | Co-ordination with various government agencies – schemes to meet the necessity of equipments in emergency.
- | To see that all vehicles like ambulance, jeep and equipments like generators and equipments essential for health care are in working condition.

**B. On receiving the warning**

- | Will ensure the availability of important medicines, life saving medicines, insecticides and if necessary contact for additional supply.

- | Round the clock control room at the district level.
- | Will send the health staff for duty in their areas as per the plan of disaster management.
- | Activate the mobile health units for the post disaster situation.
- | Will organize in advance to mobilize the local doctors and local voluntary agency for emergency work.
- | Will contact the blood donors for blood donation, on the basis of lists prepared.

### **C. Post Disaster Activities**

- | Provide first aid to the injured and shifting of seriously injured people to the nearby hospital.
- | Send sufficient stock of medicines to the affected areas immediately.
- | Will make arrangements for the available additional health staff in the affected areas deputed by the state authority.
- | Will organize to get the insecticides to prevent spreading of diseases.
- | Will ensure the purity of drinking water by testing the sources of water.
- | Will depute the mobile units for first aid.
- | Distribution of chlorine tablets and other necessary medicines from house to house.
- | Will shift the seriously injured people to the hospital.
- | Will immediately start the procedure for post mortem of the dead persons as per the rules.

## **Water Resource Department**

### **Water supply function**

#### **A. Normal time activities**

The water resource dept. shall ensure the following to be included in the DDMP:-

- | Setting up of control room and arrangement for the control room operator.
- | Assign the responsibility as nodal officer to the Executive Engineer or any other officer.
- | Prepare an alternative contingency plan to provide drinking water in case of failure of regular water distribution system during disaster.
- | Detailed information of available water resources throughout the district.
- | Arrangement of Govt. or private tankers to provide water temporary and immediately.
- | Preventive measures for water borne diseases and chlorination of water.
- | Availability of safe drinking water in the affected areas.
- | Inform the staff about the disaster.

#### **B. On receiving the warning.**

- | Organize the teams to check the sources of water / drinking water.
- | Standby arrangements of tankers for drinking water through tankers or any other available source.
- | Will make available chlorine tablets in sufficient quantity and arrange to distribute through DMTs.

#### **C. Post disaster work.**

- | Implement the alternative contingency plan to provide drinking water in case of failure of regular water distribution systems during disaster.
- | Will start work for immediate repairing of water pipes in case of damage.
- | Will arrange to check the water tanks, overhead tanks, and pumps, reservoirs and other water resources.

- | Will contact the electricity authorities to re-establish the electric supply in case of failure.
- | Will provide chlorinated water either by activating group water supply schemes individual schemes or through tankers.
- | Will provide drinking water to the relief camps / relief kitchens, shelters etc. through available resources.

### **Irrigation Function**

#### **A. Normal time activities**

The irrigation department shall carefully include the following particulars while preparing / updating the DDMP:-

- | Contact address and phone numbers of all the staff / officers, vehicles and swimmers of the District.
- | Details of irrigation related factors in the district such as rivers, pools canals, large and medium dams, etc.
- | Control room arrangements and appointment of Nodal Officer.
- | Details of damage prone areas.
- | Location of water level gauge station for flood situation.
- | To disseminate information /warning to the damage prone areas in case of flood situation.
- | Details of immediate action to be taken in case of leakage in large water storage reservoirs.
- | Supervision over major storage / reservoirs.
- | Very clear explanation of disaster and priorities during disasters to all the staff.
- | Effective working of control room at every major dam.
- | Enough and ultra modern equipments for communication.
- | Periodical checking of Dam /Waste veer, canal –tunnel, roads leading to Dams etc. for maintenance during normal time.

**B. On receiving warning**

Ensure that communication equipments like telephone, mobile phone, wireless set and siren etc. are in working conditions.

Keep the technical and non-technical staff under control, ready and alert.

Get status report of ponds, dam, canal and small dams through technical persons.

Will take decision to release the water in consultation with the competent authority and immediately warn the people living in low lying areas in case of increasing flow of water or overflow.

Keep the alternative arrangements ready in case of damage to the structure of dam / check dam to leakage or overflow in the reservoirs.

Make due arrangements to disseminate the information about the increasing and decreasing water level whatever it may be to the community, media etc.

A senior office will remain and work accordingly at large storage reservoirs.

Will arrange to provide the dewatering pumps, generators, trucks and bulldozers, excavator, boats for search and rescue operations wherever required.

**B. Post disaster work.**

Will obtain the clear picture of the condition of all the reservoirs through teams of technical officers.

Ensure about no overflow or no leakage.

If overflow or leakage is found, start immediate action to avoid adverse effect to the reservoir as per the action plan.

If there is no possibility and risk, keep the people and media informed about "everything is safe".

If overflow or any leakage is found, he will immediately warn the people living in the low lying areas.

Will take due care for the transportation of drinking water if drinking water is provided through irrigation scheme.

Will assist the local administration to use boats, dewatering pumps, etc. search and rescue operations.

## **Agriculture Department**

### **A. Normal time activities**

All the details of his subordinate staff with addresses and phone numbers and resources of irrigation for agriculture in all the villages.

Details of buildings, vehicles and equipments under his control and list of contractors with vehicles and equipments used by them.

Maps showing details of agricultural resource laboratory, seed center, agriculture training school with statistical data.

Details regarding agricultural production, extension, seed growth centers, agriculture university campus, training centers etc;

Action plan regarding the repair/alternative arrangement in case of agricultural production related facilities are disrupted.

Will prepare the action plans to avail the technical, semi technical and administrative employees along with vehicles from near by district and taluka offices.

Will inspect the sub-ordinate offices, other centers and sub-centers under his control, which are damage prone.

Will prepare a sub-plan for timely and speedy availability of machines and equipments to restoration of the economic activities in case of loss of properties as well as crops.

Will maintain the departmental equipments such as diesel generators, dumpers, generator, cutters, tree cutters, ladders, ropes, flood lights, shovels, axes, hammers, RCC cutters, cable wires, fire equipments, de-dusting equipments etc; which can be used during emergency and ensure every 3 months those are in working condition.

Will prepare a list of public properties related to agriculture in the damage prone areas and will in advance make arrangements to lessen the damage.

Will take due care to see that the emergency services at hospital, shelters, with special reference to agriculture are not disrupted.

## **B. On receiving warning**

- | Will immediately contact the District Control Room and will assist in the work assigned to him as a part of his duty.
- | Will ensure that the staff under this control is on duty at the headquarters.
- | Will assign the work to his subordinate officers and staff the work to be done regarding agriculture under DDMP and will send them to their sites.
- | Will receive instruction from the district liaison officer and will take necessary action.
- | Will ensure the availability of resources included in the DDMP and will make due arrangement to get those during emergency.
- | Will make groups having vehicles for emergency work and will assign the areas to them.
- | Will set up a temporary Control Room for the dissemination of information for emergency work and will appoint a nodal officer.

## **C. Post Disaster Activities**

- | Will follow the instruction of the District Liaison Officer.
- | Will carry out the duty assigned to him for search and rescue work.
- | Will deploy the resources and manpower available to manage the disaster.
- | Will review the matters regarding discontinuation of movement for safety measures and will see that it is restarted very soon.
- | Will send DMTs with necessary equipments in case the crop is washed away, and if there is water logging in a very large amount.
- | Will act in such a way that the human life is restored again speedily and timely in the priority areas.
- | Will contact the circle office or central control room if machines equipments, vehicles, man power, technical personnel are required to restore the agricultural activities.
- | Will make arrangement to avail the external helps to manage to disaster.
- | Will collect the details of loss of crops to send it to the district administration.
- | Should have the details of village wise various crops in the district.
- | Will prepare a primary survey report of crop damage in the area and will send the same

to district control room and also to the administrative head

Will immediately put the action plan in real action during the emergency.

## **S.E.B.G**

### **A. Normal time activities**

While preparing a separate plan regarding S.E.B.G (State Electricity Board Goa) will prepare the list of available resource as a part of DDMP. It will include the following:

- | Details of the staff members with their contact addresses and telephone numbers.
- | Maps showing the power stations, sub-stations, Diversification of Power units (DPs), transformers and major electric lines with detail information.
- | Other important details like water supply scheme depending on electricity, drainage systems, railway stations, bus-depots, ports, strategically important places, army, air force, navy camps, light houses, major hospitals and for that he will check and ensure of electric supply during emergency.
- | Prepare an action plan for repairs / alternative arrangement in the case of electricity disruption as a part of DDMP.
- | Inspect at every 3 months the power stations. Sub-stations etc; which are damage prone.
- | The, plan should include for timely supply of electric poles, D.Ps, transformers etc; at the time of line disruption.
- | To prepare an action plan for immediate procurement of the required tools and equipments for restoration of electric supply on temporary bases.
- | To prepare a list of public properties related to S.E.B.G, which are in the damage prone areas and will make advance arrangements to minimize the damage.

## **B. On receiving the warning**

- | To contact the District Control Room and assist in their work.
- | To ensure that all the employees remain present on duty at the taluka head quarter.
- | To assign work to all officers/employees related to S.E.B.G.
- | Will ensure to make available the resources available and will establish contacts for the same to deploy those at the time of emergency, which are included in the DDMP.
- | To consult the District Liaison Officer to discontinue the supply in case of damage in the line or for the safety of the people and property.
- | To make groups having vehicles for the emergency work and will assign the areas.
- | To immediately set up a temporary control room in the office for dissemination of information during the disaster and will appoint a nodal officer from S.E.B.G for this work.

## **C. Post Disaster Activities**

- | To follow the instructions of the district liaison officer.
- | To perform the duties assigned for the search and rescue work.
- | To deploy the resources and manpower required for the disaster management.
- | To dispatch the task forces with necessary equipments to the place where the electric supply is disrupted and ensures that the same is restarted at the earliest.
- | Contact the circle office or the Central Control Room of SEBG to procure the machines and equipments, vehicles, manpower, technical personnel for restoration of the electric supply.
- | To utilize the external resources and manpower allotted to him in a planed manner for disaster management.
- | To immediately undertake the emergency repairing work as mentioned in the action plan.
- | To prepare a primary survey report regarding damage in the area and send the same to the district control room and to the own administrative head immediately.
- | To make temporary arrangement for electric supply to the places like hospitals, shelter, jail, police stations, bus depots etc; with D.G. sets in.

## **Public Works Department**

### **A. Normal time activities**

- | Details of the staff members with their contact addresses and telephone numbers.
- | Details of buildings, vehicles and equipment as well as the names of contractors and the vehicles & equipment used by them.
- | Maps of the areas in the district with the statistical data related to available resources.
- | The position of approach roads and other road of all the villages including bridges, railway crossing etc.
- | To strictly observe the rules during the constructions regarding earthquake and cyclone proof materials.
- | The PWD will inspect periodically the buildings, residences, high rise buildings under their control.
- | Damage prone road bridges and arrangement for their inspections
- | Action plan for emergency repairs.
- | Will appoint an officer of the rank of Assistant Engineer to coordinate during emergency at the District Control Room.
- | Will maintain the departmental equipments such as bulldozers, tractors, water tankers, dumpers, earthmovers excavator, de-watering pumps, generators, cutters, tree cutters, ladders, ropes, flood lights, shovels, axes, hammers, RCC cutters etc; which can be used during emergency and will quarterly check up these to ensure in working condition.

### **B. On receiving the warning**

- | Will immediately contact the District Control Room for assistance.
- | Will ensure that all the staff members remain on duty at the headquarters.
- | Will send the officers and the staff assigning them specific duties for the DDMP

Undertake all the action for the disaster management required to be done by the PWD after receiving instructions from district liaison officer.

### **C. Post Disaster Activities**

Will follow the instructions of the District Liaison Officer

Will remain active for search and rescue activities

Will provide all the available resources and manpower for disaster management.

Will mobilize the service of technical personnel for the damage survey work to help the district administration

Will prepare a primary report of damage in the affected area within 12 hrs / 24 hrs looking to the emerging situation

Will make arrangements for electricity, water, and latrines in the temporary shelters. Will also inspect the approach roads leading to the temporary shelter and repair the same if so required.

## **Telephone Department**

### **A. Normal time activities**

Details of the staff members with their contact addresses and telephone numbers.

Details of buildings, vehicles and equipments including the contractors and the vehicles and equipments used by them.

Maps showing the details of telephone exchanges, D.Ps, important telephone lines, hot lines, telex lines, microwave towers with statistical data.

Details of telephone numbers of water supplies, Control Room, hospitals, drainage system, railway stations, bus depots, strategically important places, ports, Army, Air force, Navy camps, Jail, Police Station and other sensitive places, light houses, major industrial units, and other communication channels which can be used during emergency.

Action plan for repairs/alternative arrangement in case of disruption of telephone line and microwave towers.

- | Inspect the telephone exchanges/sub-exchanges in the damage prone area at every 3 months.
- | To appoint an officer not below the rank of telephone inspector to coordinate the district control room during emergency.

- | To maintain the equipments such as diesel generators, dumpers, generator, cutters, tree cutters, ladder &, ropes, flood lights, shovels, axes, hammers, RCC cutters, cable wires, fire equipments, etc; which can be used during emergency and ensure every month that these are in working condition.
- | To ensure that the telephone lines at the shelters, emergency hospitals, police stations, control room and other places of emergency services, which can be used during disaster, are not disrupted.
- | To prepare a list of public properties related to the telephone department which are in damage prone areas and will make arrangements to lessen the damage.

**B. On receiving the warning**

- ◆ To contact the District Control Room and assist in the work.
- ◆ To ensure that the staff are on duty at the headquarters.
- ◆ To assign work to the subordinate officers as per the DDMP and send them to the sites.
- ◆ To receive the instructions from the District Liaison Officer and to do the needful.
- ◆ To ensure availability of resources included in the DDMP and establish contacts for the same during emergency.
- ◆ To setup a temporary control room for the exchange of information for emergency work and will appoint a nodal officer.

**C. Post Disaster Activities**

- ◆ To follow the instructions of District Liaison Officer.
- ◆ To perform the duties assigned for search and rescue work.
- ◆ To deploy the resources and manpower available to manage the disaster.
- ◆ To review the situation regarding disconnected telephone lines due to safety measures and reestablish the communication network as soon as possible.
- ◆ To send the Disaster Management Teams with the necessary equipments for restoration of the telephone lines speedily where the lines are disrupted and to such places, which are strategically important.

- ◆ To make arrangements to obtain external help to manage the disaster.
- ◆ To prepare a primary survey report of damage and to send the same to the District Control Room and also to the administrative head within 6 hours.
- ◆ To arrange for temporary hotline services or temporary telephone connections at the District Control Room, hospitals, shelters, ports, jails, police station, bus depots, etc.
- ◆ To immediately undertake the emergency repairing work.
- | To make an action plan to avail immediately and timely, telephone poles, D.Ps, transformer to the established the communication system.
- | To prepare an action plan to avail temporarily, technical personnel from the near by district, staff and vehicles from the district office which are not affected in consultation with the district authority.

## **Animal Husbandry**

### **A. Normal time activities**

- ◆ Addresses of members with telephone numbers.
- ◆ Details of veterinary centers, artificial insemination centers, veterinary dispensary, veterinary colleges' buildings, vehicles, mobile dispensaries and
- ◆ equipments and also the details of vehicles and equipments used often by out source.
- ◆ Maps showing the details of animal breeding laboratories, animal vaccination centers, animal husbandry training school with statistical data.
- ◆ Details of essential facilities to be provided at sensitive place such as important animal husbandry centers, veterinary college campus, training center etc;
- ◆ Arrangement of repairs/alternative arrangements in case the facilities related to animal husbandry and veterinary services are disrupted.

- ◆ To make arrangements to necessary medicines, vaccines and other material, for treatment of animals.
- ◆ To collect the details of cattle in each village of the taluka, details of safe places for the treatment of animal, milk dairies, other private veterinary doctors and facilities related to it.
- ◆ To appoint an employee not below the rank of livestock inspector to coordinate the District Control Room during emergency.
- ◆ To maintain the equipments available such as stands to keep animals, sharp instruments, insecticides, diesel generators, dumpers, generator, cutters, tree cutters, ladders, ropes, flood lights, shovels, axes, hammers, RCC cutters, cable wires, fire equipments, de-dusting equipments etc; which can be used during emergency and will also ensure that they are in working condition.
- ◆ To see that essential services related to animal husbandry and  
Veterinary services are not disrupted at the time of emergencies.
- ◆ To prepare a list of public properties related to animal husbandry, which are damage prone areas and will make advance planning to lessen the damage.

**B. On receiving the 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.

**C. Post Disaster Activities**

- ◆ To follow the instruction of the District Liaison Officer.

- ◆ To carry out the duty assigned to him for search and rescue work.
- ◆ To deploy the available resources and manpower to manage the disaster.
- ◆ To review the matters to restart the milk collection activity where it has been closed for security measures.
- ◆ To send DMTs with necessary equipments in case of cattle death are there in the affected areas for the disposal of carcass with a view to restoration of public life and result oriented work. To arrange to treat the injured cattle.
- ◆ To contact the State Director of A.H. if additional equipments vehicles,

manpower, technical personnel etc; are required for restoration of the cattle related activities.

## **State Transport**

### **A. Normal time activities**

- ◆ Details of the staff with contact numbers, details of bus drivers, conductors,  
mechanical and supervisory staff.
- ◆ Details of location of buses in all the areas of the district available round the clock.
- ◆ Details of fuel arrangements for buses for emergency work.
- ◆ Do's and Don'ts to be observed strictly during emergencies and details of priorities should be given to the staff.
- ◆ Arrangement for additional buses for evacuation of people from the affected areas.
- ◆ Details of buildings, vehicles and equipments under his control and list of contractors with vehicles and equipments used by them.
- ◆ Map showing S.T. depots, pick up stand, control point, S.T. garages and important routes with equipments of communication, telephone line, telex lines, megaphone, amplifiers with statistical data.
- ◆ Details of important telephone numbers of water supply schemes, control room hospitals, drainage system, railway stations, bus depots, strategically important places, ports, Army Air force Navy camps and other sensitive places, light houses, major industrial units, and other communication channels which can be used during emergency/calamity.
- ◆ Action plan regarding repairs/alternative arrangement in case of disruption of transport services.
- ◆ Alternative routes for the transportation and road network.
- ◆ To inspect the damage prone S. T. Depots, pick up stand, control points, garages etc; at the frequency of every three months.
- ◆ To plan out for restoration of goods transportation in case of damages observed, to the buses & parcel van.

- ◆ To prepare an action plan to procure temporary buses, the technical personnel from the near by district which are not affected.
- ◆ To maintain the equipments available such as cranes, diesel generator, earth over machines, de-dusting pumps, cutters, tree cutters, ladders, ropes, flood lights, shovels, axes, hammers, RCC cutters, etc. which can be used during emergency and will ensure that those are in the working conditions.
- ◆ To take due care to see that the transportation at shelters and emergency hospital is not disrupted during calamities.
- ◆ To prepare a list of public properties related to transport department, which are in the damage prone area and will arrange in advance to minimize the damage.

**B. On receiving the warning**

- ◆ To set up a temporary special control room and information center at the main bus station.
- ◆ 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 receive instructions from the district liaison officer and will do the needful.

To ensure for not allowing passenger buses to move out of the S.T. Depots during final warnings of cyclone, flood etc; to take safety measures for passengers who cannot return back to their home.

- ◆ To ensure the availability of resources included in the DDMP and will make due arrangements to get those during emergency.
- ◆ To consult the Liaison Officer to close the transportation in the damage prone areas for the safety of the people and the property.
- ◆ To make groups having vehicles for emergency work and will assign the areas to them.
- ◆ To set up a temporary control room for the dissemination of

information for emergency work and will appoint a nodal officer.

- ◆ To make available the sufficient number of S.T. buses to the state administration for the evacuation of the people to safe places from the disaster prone areas.
- ◆ To assist the administration to send the messages of warning to the remote areas through the drivers/conductors on transport routes.

### **C. Post Disaster Activities**

- | To follow the instructions of District Liaison Officer.
- | To carry out the duty assigned for search and rescue work
- ◆ To engage the resources and manpower available to manage the disaster.
- ◆ To review the matter regarding closing of movement of buses for safety reason and see that those are restarted very soon.
- ◆ To send DMTs with necessary equipments if the transportation is disrupted.
- ◆ To contact the District Control Room if additional equipments, vehicles, manpower, technical personnel, which are required to restore the transportation related activities.
- ◆ To prepare a primary survey report on damage in the area and will send it to the district control room and also to the administrative head within 6 hours.
- ◆ To make temporary arrangement of transportation for control rooms, hospitals, shelters, bus depots etc.
- ◆ To immediately undertake repairs needed at the bus stations.
- ◆ To collect the details of roads, damaged and will get them repaired  
in co-ordination with competent authority and will restore the bus services.

## **Forest Department**

### **A. Normal time activities**

- ◆ Addresses of members with telephone numbers.
- ◆ Details of veterinary centers, artificial insemination centers, veterinary dispensary, veterinary colleges' buildings, vehicles, mobile dispensaries and equipments under his control and also the details of vehicles and equipments used often by out source.
- ◆ Maps showing the details of area with statistical data.
- ◆ Approach roads under forest department and their condition including bridges, causeways, railway crossing etc.
- ◆ Inspection of damage prone roads, bridges, check dams, causeways, under forest department
- ◆ To inspect periodically the buildings, residencies, high causeways under forest department
- ◆ To maintain the equipments available such as sharp instruments, insecticides, diesel generators, dumpers, generator, cutters, tree cutters, ladders, ropes, flood lights, shovels, axes, hammers, RCC cutters, cable wires, fire equipments, de- dusting equipments etc; which can be used during emergency and will also ensure that they are in working condition.
- ◆ To take care of public shelters, other places to be used for evacuation with primary facilities like water
- ◆ To prepare a list of public properties in the damage prone forest areas and will make advance arrangements to lessen the damage.

#### **B. On Receiving the 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 in advance arrangement for fuel wood and bamboos for priority areas.

### **C. Post Disaster Activities**

- | To follow the instructions of District Liaison Officer
- | 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 latrine 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.

## **Port Office**

### **A. Normal time activities**

- | Details of the staff with their address and phone numbers, details of port workers, securities, mechanics and supervisory staff. Details of location of ports & jetties in all the areas of the district working round the clock.
- | Details of fuel arrangement for ships-mechanized launches at the time of emergency.
- | Do's and Don'ts to be observed during emergencies and details of priorities should be given to the staff.
- | Set up for evacuation of people from affected area of the port area.
- | Details of buildings, vehicles and equipments and list of contractors with vehicles and equipments.
- | Map showing ports, Jetties, light houses, signals, as well as important routes, communication equipments, telephone line, telex lines, megaphone, amplifiers with statistical data.

- | Details of important telephone numbers of water supplies, control room, hospitals, drainage system, railway stations, bus depots, strategically important places, Army Air force Navy camps and other sensitive places, light houses, major industrial units, and other communication channels which can be used during emergency.
- | Arrangement for transportation & evacuation of people from the affected areas.
- | Action plan regarding repairs and alternative ways in case of disruption of transportation.
- | Plan showing the alternative routes and arrangement for transportation of goods etc; during emergencies.
- | To inspect the port, jetties, lighthouses, signals, pick up stand, garages, control point etc; which are damage prone.
- | To make due arrangement for materials to restore the facilities in case the movement of the materials and goods on the ports are damaged.
- | To prepare an action plan to avail on temporary bases, the technical personnel from the near by district which is not affected. Will also collect the details of swimmers in the district.
- | To make arrangement for sufficient fuel during emergency.
- | To maintain the equipments available such as cranes, diesel generator, earth mover machines, de-dusting pumps, cutters, tree cutters, ladders, ropes, flood lights, shovels, axes, hammers, RCC cutters, etc. which can be used during emergency and will ensure that those are in the working conditions.
- | To take due care to see that the transportation at shelters and emergency hospital is not disrupted during calamities.
- | To prepare a list of public properties related to transport department, which are in the damage prone area and will arrange in advance to minimize the damage.

**B. On receiving the warning**

- | To set up a temporary special control room and information center at the main bus station.

- | To immediately contact the district control room and will assist in the work
- | To ensure that the staff is on duty at the headquarter.
- | 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 specifically take action to ensure that the port workers, tourists and fishermen do not move out for fishing as well as sailing during the final warnings of cyclone, flood, etc.
- | To evacuate the fishermen and saltpan workers to a safe place and if they deny, to get it done forcefully.
- | To ensure that the warning signals are received in time and shown immediately to the people.
- | To undertake the work of search and rescue and also the relief work in co-ordination with Navy Coast Guard.
- | To ensure the availability of resources included in the DDMP and will make due arrangements to get those during emergency.
- | To consult the liaison officer to close the ports and sailing in the sea, which is damage prone or dangerous for the safety of the people as well as the property.
- | To assist the administration to send the messages regarding warning to the remote area as well as the coastal areas through the port staff.

### **C. Post Disaster Activities**

- | To follow the instructions of District Liaison Officer.
- | To carry out the duty assigned for search and rescue work.
- | To engage the resources and manpower available to manage the disaster.
- | To review the matters regarding closing of movement at the port for safety measures and will ensure that it is restarted very soon.
- | To contact the district control room if additional equipments, vehicles, manpower, technical personnel are necessary to restore the port related activities.
- | To prepare a primary survey report of damage and send it to the District Control Room and to the administrative head.

- | To collect the details of ports, jetties, light houses as well as approach roads connecting the damaged ports and will get them repaired in co-ordination with the competent authority and will help for restoration of the economic activities pertaining to ports.

### **8.4.1 Checklist of Various Department**

#### **Preparedness Checklist for the District Collector**

- | Preparation of the DDMAP with the assistance of DDMC.
- | Setting up District Control Room.
- | Under the DDMP, district level agencies would be responsible for directing field interventions through various agencies right from the stage of warning to relief and rehabilitation.
- | At the disaster site, specific tasks to manage the disaster will be performed.
- | Collector will be an integral part of the DCR.
- | Collector will be assisted by SOC.
- | SOC will be headed by a Site Manager.
- | Site Manager will co-ordinate the activities at various camp sites and affected areas.
- | The site Operations Centre will report to the District Control Room.
- | The Collector will co-ordinate all the field responses which include, setting up  
Transit Camps, Relief Camps and Cattle  
Camps.

#### **Preparedness Checklist for the Police Department**

The department is familiar with the disaster response plan and disaster response

procedures are clearly defined.

- | Orientation and training for disaster response plan and procedures undertaken.
- | Special skills required during emergency operations imparted to the officials and the staff.
- | Reviewed and updated the precautionary measures and procedures, the precautions to be taken to protect equipment, the post-disaster procedures to be followed.
- | Adequate warning mechanisms established for evacuation.
- | An Officer has been designated as Nodal Officer for Disaster Management.
- | Sources of materials required for response operations have been identified.

### **Preparedness Checklist for the Health Department**

- | The department is familiar with the disaster response plan and disaster response procedures are clearly defined.
- | Orientation and training for disaster response plan and procedures undertaken.
- | Special skills required during emergency operations imparted to the officials and the staff.
- | Reviewed and updated the precautionary measures and procedures, the precautions to be taken to protect equipment, the post-disaster procedures to be followed.
- | A hospital plan for the facilities, equipment and staff of that particular hospital based on “The Guide to Health Management in Disasters” has been developed.
- | Hospital staff is aware of which hospital rooms / buildings are damage- proof.
- | All the staff of the hospital has been informed about the possible disasters in the district, likely damages and effects, and information about ways to protect life, equipment and property.
- | An area of hospital identified for receiving large number for casualties.
- | Emergency admission procedures with adequate record keeping developed.
- | Field staff oriented about DDMP, standards of services, and procedures for tagging.

- | An Officer has been designated as Nodal Officer for Disaster Management.
- | Sources of materials required for response operations have been identified.

### **Preparedness Checklist for S.E.B.G**

- | The department is familiar with the disaster response plan and disaster response procedures are clearly defined.
- | Orientation and training for disaster response plan and procedures undertaken.
- | Special skills required during emergency operations imparted to the officials and the staff.
- | Reviewed and updated the precautionary measures and procedures, the precautions to be taken to protect equipment, the post-disaster procedures to be followed.
- | An Officer has been designated as Nodal Officer for Disaster Management.
- | Sources of materials required for response operations have been identified.

### **Preparedness Checklist for Water Resource Department**

- | The department is familiar with the disaster response plan and disaster response procedures are clearly defined.
- | Orientation and training for disaster response plan and procedures undertaken.
- | Special skills required during emergency operations imparted to the officials and the staff.

- | Reviewed and updated the precautionary measures and procedures, the precautions to be taken to protect equipment, the post-disaster procedures to be followed.
- | Adequate warning mechanisms for informing people to store an emergency supply of water have been developed.
- | Established for the emergency distribution of water if existing supply is disrupted.
- | An Officer has been designated as Nodal Officer for Disaster Management.
- | Sources of materials required for response operations have been identified.

### **Preparedness Checklist for Irrigation Department**

- | The department is familiar with the disaster response plan and disaster response procedures are clearly defined.
- | Orientation and training for disaster response plan and procedures undertaken.
- | Special skills required during emergency operations imparted to the officials and the staff.
- | Reviewed and updated the precautionary measures and procedures, the precautions to be taken to protect equipment, the post-disaster procedures to be followed.
- | Flood monitoring mechanisms can be activated in all flood prone areas from 1<sup>st</sup> June.
- | All staff is well aware of the precautions to be taken to protect their lives and personal property.
- | Each technical assistant has instructions and knows operating procedures for disaster conditions.
- | Methods of monitoring and impounding the levels in the tanks evolved.
- | A system of alerting officers on other dam sites and the district control room, established.
- | Mechanisms evolved for forewarning settlements in the downstream, evacuation, coordination with other dam

authorities.

- | An Officer has been designated as Nodal Officer for Disaster Management.
- | Sources of materials required for response operations have been identified.

### **Preparedness Checklist for Telephone Department**

- | The department is familiar with the disaster response plan and disaster response procedures are clearly defined.
- | Orientation and training for disaster response plan and procedures undertaken.
- | Special skills required during emergency operations imparted to the officials and the staff.
- | Reviewed and updated the precautionary measures and procedures, the precautions to be taken to protect equipment, the post-disaster procedures to be followed.
- | An Officer has been designated as Nodal Officer for Disaster Management.
- | Sources of materials required for response operations have been identified.

### **Preparedness Checklist for PWD**

- | The department is familiar with the disaster response plan and disaster response procedures are clearly defined.
  - | Orientation and training for disaster response plan and procedures undertaken.
  - | Special skills required during emergency operations imparted to the officials and the staff.
  - | Reviewed and updated the precautionary measures and procedures, the precautions to be taken to protect equipment, the post-disaster procedures to be followed.
1. All officers are familiar with pre-disaster precautions and post-disaster procedures for road clearing and for defining safe evacuation routes

where necessary.

! An Officer has been designated as Nodal Officer for Disaster Management.

! Sources of materials required for response operations have been identified.

### **Preparedness Checklist for Agriculture Department**

! The department is familiar with the disaster response plan and disaster response procedures are clearly defined.

! Orientation and training for disaster response plan and procedures undertaken.

! Special skills required during emergency operations imparted to the officials and the staff.

! Reviewed and updated the precautionary measures and procedures, the precautions to be taken to protect equipment, the post-disaster procedures to be followed.

! Information provided to all concerned officers about the disasters, likely damages to crops and plantations, and information about ways to protect the same.

! The NGOs and the other relief organizations are informed about the resources of the department.

! An Officer has been designated as Nodal Officer for Disaster Management.

! Sources of materials required for response operations have been identified.

### **Preparedness Checklist for Animal Husbandry**

#### **Department**

! The department is familiar with the disaster response plan and disaster response procedures are clearly defined.

! Orientation and training for disaster response plan and procedures undertaken.

! Special skills required during emergency operations imparted to the officials and the staff.

! Reviewed and updated the precautionary measures and procedures, the

precautions to be taken to protect equipment, the post-disaster procedures to be followed.

- | Hospital staff is aware of which hospital rooms / buildings are damage-proof.
- | All the staff of the veterinary hospitals and centers have been informed about the possible disasters, likely damages and effects, and information about the ways to protect life, equipment and property.
- | An area of the hospital identified for receiving large number of livestock.
- | Emergency admission procedures with adequate record keeping developed.
- | An Officer has been designated as Nodal Officer for Disaster Management.
- | Sources of materials required for response operations have been identified.

# CHAPTER – 9

## MITIGATION STRATEGIES FOR SECTOR-WISE

### VULNERABILITY REDUCTION

#### 9.1 Sector wise Vulnerability Reduction Measures (Short Term)

Type of Sector	Mitigation Measures	Responsibility Dept.	Time Frme
INFRASTRUCTURE DEVELOPMENT	<p>AWARENESS:</p> <ul style="list-style-type: none"> <li>Posters, rallies, street plays, volunteers training, task force training</li> </ul>	DIP, NGOS / CBO / SHGs, BDOs.	During the 2 <sup>nd</sup> quarter of April & 1 <sup>st</sup> week of May every year
	<p>ROADS:</p> <ul style="list-style-type: none"> <li>Repair vulnerable points identified by the departments</li> </ul>	PWD, RD, DMA, Director Panchayat	By 1 <sup>st</sup> of May
	<p>EMBANKMENTS:</p> <ul style="list-style-type: none"> <li>Receiving the Height of the embankment points identified.</li> <li>Repair of vulnerable points identified.</li> </ul>	WRD, Irrigation Department	By 1 <sup>st</sup> of May
	<p>RELIEF SHELTERS:</p> <ul style="list-style-type: none"> <li>Ensure</li> </ul>	PWD, Mamlatdar, Dir Education & owners of	By 1 <sup>st</sup> of May

	maintenance of shelters	concerned buildings	
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9.2 Sector wise Vulnerability Reduction Measures (Long Term)-

<b>SECTOR</b>	<b>MITIGATION MEASURES</b>	<u>AGENCY RESPONSIBLE</u>
INFRASTRUCTURE DEVELOPMENT	<ul style="list-style-type: none"> <li>• IEC ACTIVITY: Improving Information Education and communication activities through posters, street plays, volunteers training, village task force training, mass rallies during normal period.</li> </ul>	DIP, Leading NGOs / CBOs / VOs / SHGs.
	<ul style="list-style-type: none"> <li>• ROADS: Repairs/ Restoration of vulnerable points on <b>Roads</b> before onset of monsoon.</li> </ul>	PWD, RD, DMA, Panchayat at Samiti.
	<ul style="list-style-type: none"> <li>• EMBANKMENTS: Repairs of Vulnerable points in river / canal <b>Embankment</b> during free flood period.</li> </ul>	WRD/ Irrigation/ Minor irrigation.
	<ul style="list-style-type: none"> <li>• RELIEF SHELTERS: Ensuring proper maintenance of <b>relief shelters / shelter designated places.</b></li> </ul>	Mamlatdar/ owner of the building / Block-village level committee (if formed).

	<ul style="list-style-type: none"> <li>• COMMUNICATION: Provision of VHF in all Taluka Headquarters.</li> <li>▪ Ensure maintenance and proper functioning of electronic communication system.</li> <li>▪ Proper maintenance of VHF system.</li> </ul>	<u>State Govt.</u> <ul style="list-style-type: none"> <li>• Telecom Dept.</li> <li>• S.P. (North) / Head of office of the concerned location.</li> </ul>
	<ul style="list-style-type: none"> <li>• WATER SUPPLY: Immediate Response for Repair / Replacement of Tube wells / Pipe line water supply system.</li> </ul>	PHE/ Irrigation Dept.
HEALTH/ ANIMALHUSBANDRY	<ul style="list-style-type: none"> <li>• IEC ACTIVITIES: By way of posters, street play, village task force/ volunteers training, during normal period.</li> </ul>	By leading NGOs. & DAHVS (Animal Husbandry Dept.)
	<ul style="list-style-type: none"> <li>• VACCINATION: Adequate stock piling of vaccines should be ensured for vaccination before disaster.</li> </ul>	DHS, DAHVS

	<ul style="list-style-type: none"> <li>• <b>TRAINING:</b> Training Programme of common people should be programmed for Health care, sanitation and first Aid from village level of district level.</li> </ul>	DHS, DAHVS.
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LIVELIHOOD SECTOR	<ul style="list-style-type: none"> <li>• <b>AWARENESS:</b> By way of <b>IEC activities</b> through walling posters, street play, village task force / volunteers training, during normal period.</li> </ul>	DIP, Lead Banks, lead NGOs / CBOs/ SHGs.
	<ul style="list-style-type: none"> <li>• <b>AGRICULTURE:</b> To reduce adverse impact on agriculture, farmers should be advised: <ul style="list-style-type: none"> <li>• Alternate cropping pattern,</li> <li>• Flood resistance crops,</li> <li>• Ensuring crop insurance,</li> <li>• Raising of Nursery in the horticulture farms &amp; insurance coverage of horticultural products.</li> </ul> </li> </ul>	Director, Agriculture,  Director, Horticulture.
INSURANCE	<ul style="list-style-type: none"> <li>• <b>IEC ACTIVITY:</b> IEC Activities to be carried out through posters, street play, village task force/ volunteers training, during normal period</li> </ul>	DIP, Lead NGO / CBO / SHG, Lead Bank.

	<ul style="list-style-type: none"> <li>• Promote insurance of livestock, crops, work-sheds, houses, shops, valuables etc.</li> <li>• Promote micro-insurance facilities.</li> </ul>	Lead NGOs / CBO/ SHG, Agricultural Co-operative Societies (IF any), Insurance Companies.
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## CHAPTER– 10

### INFORMATION, EDUCATION AND COMMUNICATION (IEC)

#### 10.1 Plan Dissemination and Evaluation:

For any DDMP to be effective, it is important that the whole plan and the various procedures and strategies therein, are understood not only by the different disaster response agencies but also the general public. To achieve this, it is *sine quo non* that wide ranging publicity is given to the DDMP. The dissemination must be at two levels:

1. To the various district authorities, HODs, Line departments, Dy Collectors, Mamlatdars, BDOs, PRIs, Local Bodies, NGOs, other civil society partners, other agencies and institutions within the district.
2. To the general Public.

After dissemination of the plan is undertaken, necessary feedback, comments, observations and suggestions should also be obtained so that the same may be incorporated in the DDMP after due consideration.

#### 10.2 Dissemination of Other IEC Materials:

The DIP at the state and district level will carry on the dissemination of IEC materials and the local bodies like Village Panchayats and Urban local bodies in coordination with leading

NGOs / CBOs will undertake IEC activities at the Taluka / Village level. The various modes of IEC activities may include, inter alia,

- Poster campaign.
- Pamphlets and brochure preparation and distribution.
- Foot-march / Padyatra,
- Cycle Rallies,
- Street plays,
- Volunteers training,
- Task force training, etc.

<u>MODE</u>	<u>AGENCY RESPONSIBLE</u>
Wall Paintings, street plays, Village level task force / Volunteers training.	<ul style="list-style-type: none"> <li>➤ Dy Collector / Mamlatdar.</li> <li>➤ Local Bodies-VPs / ULBs.</li> <li>➤ NGOs / CBOs and other volunteer groups.</li> </ul>
Slides in Cinema Halls.	<ul style="list-style-type: none"> <li>➤ Magisterial Branch, Collectorate.</li> </ul>
Hand Bills, Paper advertisements.	<ul style="list-style-type: none"> <li>➤ Director of Information &amp; Publicity.</li> <li>➤ Local Bodies-VPs / ULBs.</li> <li>➤ Private sponsorships.</li> </ul>
Media & Press releases.	<ul style="list-style-type: none"> <li>➤ Director of Information &amp; Publicity.</li> <li>➤ Station Director AIR / DD.</li> <li>➤ Local FM Channels.</li> <li>➤ Cable TV networks.</li> </ul>
Posters, Cartoons, Charts, Photographs, Folk songs.	<ul style="list-style-type: none"> <li>➤ Director of Information &amp; Publicity.</li> <li>➤ Local Bodies-VPs / ULBs.</li> <li>➤ NGOs / CBOs etc.</li> </ul>
Training Camps, Group discussion and special lectures by Community leaders.	<ul style="list-style-type: none"> <li>➤ Dy Collector / Mamlatdars.</li> <li>➤ SP / Director Fire Services.</li> <li>➤ DIP.</li> <li>➤ Local Bodies- VPs / ULBs.</li> <li>➤ NGOs / CBOs etc.</li> </ul>

### 10.3 Training and Drills:

The training programmes need to be organized for different levels of functionaries at the district level, officials of the line departments, identified NGOs / CBOs, Private Sector organizations etc, in order to equip them to extend training facilities of functionaries at blocks and village level as well as organize mock-drills / simulation exercises within the community.

The objective of full scale drill includes evaluation of the following:

- Practicality of the DDMP (Structure and organization).
- Adequacy of communication and interactions among the agencies and the public.
- Emergency equipment effectiveness.
- Adequacy of first aid and search and rescue procedures.
- Adequacy of emergency personnel response and training.
- Public relation skills.
- Evacuation and count procedures.
- Timely updating of information at the DCR.
- Coordination with the CBOs / NGOs.

MODE	AGENCY RESPONSIBLE
Training Programme for Search & Rescue, Relief	Director of Fire & Emergency Services.
Training for Common People on Health Care, Sanitation & First Aid.	DHS / Mamlatdars.
Disaster Orientation Training of Police / Fire Personnel / Medical Staffs.	SP / DHS / Director of Fire & Emergency Services.

#### 10.4 Community Based Disaster Preparedness Plans and Mock Drills:

The role of the community as a whole cannot be overlooked in any preparedness and response strategy in tackling a disaster scenario. Quite often the disaster creates havoc and destruction on a scale that is unprecedented and to cope with such magnitude of

destruction, the entire administrative machinery in collaboration with the community as a whole has to be galvanized into action.

The community plays a very critical role in the following areas:

- First respond to a disaster.
- Participate in preparedness activities.
- Active suggestions in formulation of response strategies.
- Sharing of disaster preparedness and response cost.
- Acts as a pressure group / advocacy of new ideas and techniques.
- Supporting communication System.

The Community needs to be actively involved in the disaster preparedness and formulation of local disaster response plans. The Dy. Collector / Mamlatdars and the local bodies – Village Panchayats, Municipal Councils etc have a very crucial role to play in this regard.

- Formation of Taluka-Level Disaster Management Committees.
- Training of line department officials and volunteers.
- Formation of VP-Level Committees and enrolling of volunteers.
- Developing Contingency Plans at the village-level.
- Training of Task Forces
- Periodic mock drills.
- Regular meetings and coordination between VPs and Taluka-level Committees.
- Updating resource inventory and information at local level.

Role & Responsibility of the Community	First & Prompt response to Disaster.
Disaster Preparedness Initiatives	Community Preparedness Programme.
➤ Preparation of Taluka-level DMP.	Action: <ul style="list-style-type: none"> <li>➤ Dy Collectors / Mamlatdars / BDOs.</li> <li>➤ Local bodies-VPs / Municipal Councils.</li> <li>➤ NGOs / CBOs.</li> </ul>

➤ Mapping of Vulnerability Zones.	Action:  ➤ Mamlatdars / Deputy Collector. ➤ Local Bodies. ➤ Voluntary Groups.
➤ Identification of Shelters / relief campsites.	Action:  ➤ Dy. Collector / Mamlatdars. ➤ CE-PWD. ➤ Local Bodies.
➤ Formation of Disaster Preparedness Committee in the villages.	Action:  ➤ Mamlatdars / BDO. ➤ Local Bodies – Village Panchayats.
➤ Mock Drills.	Action:  ➤ Dy Collector / Mamlatdars / BDO. ➤ Director Fire Services. ➤ SP ➤ Local Bodies – Village Panchayats. ➤ NGOs / CBOs and other voluntary groups.

Mock drills are important in normal times as well as during the emergency. The mock drill and preparedness for disaster are a concerted and coordinated affair, which requires the interplay and cohesion of various departments. The primary responsibility of carrying out the mock-drills would rest with the SP, Director Fire Services, Inspectorate of Factories and Boilers, PWD and DHS. Every six month, there should be a mock drill in all of the police stations and fire stations of the district to make them alert / fit to cope with any situation. The Off-site Management Plan should be reviewed by the Inspectorate of Factories and Boilers and mock-drills should be carried out for chemical accidents. Similarly, all police stations should have internal security scheme, based on which they should have mock drills and update it for safety measures as per requirement.

Besides, a realistic contingency drill should be enacted during the flood / cyclone season so that everyone knows what he / she should do and where he / she should go. It is advisable to have a mock drill at night during the rain, by cutting of the electricity in the

village / block (as per the time chosen for the mock drill at each level). This exercise will provide a hand –on experience to the officials involved in disaster response as well as the public at large and give an idea of the possible problems that would be faced. These learned lessons Could be utilized in the updation and improvement of the DDMP and the Taluka – level DMPs.

### **Setting up of Village –Level Disaster Volunteer Force – Identification and Training.**

A Formidable yet essential task in ensuring the prompt and effective disaster management is to involvement of the village community in disaster response. The most well –accepted way of achieving this is the constitution of Village –Level Disaster Volunteer Force (VLDVF). The VLDVF is further subdivided into Specific Task Groups (STG) to take care of a particular and Specific activity in disaster management. This is essential to avoid duplication of work and confusion during times of crisis. The motivated and willing men and women have to be identified and organized into STGs and trained in their respective roles and responsibilities. The following is an indicative list of the STGs that can be formed and trained at the village level:-

<b>Sr. No.</b>	<b>Name of STG</b>	<b>Role &amp; Responsibility</b>
1.	Warning Group	<ul style="list-style-type: none"> <li>◆ Young men and women (15 -25 yrs)</li> <li>◆ Training to understand radio warnings /Signals from PCR/Fire CR / Taluka CRs.</li> <li>◆ Act quickly and spread the message in the whole village.</li> </ul>
2.	Rescue and Evacuation Group.	<ul style="list-style-type: none"> <li>◆ Physically strong men and women (18-35 years )</li> <li>◆ Try to include all ex-servicemen / Civil defence personnel in this group.</li> <li>◆ Training on TRIAGE/ rescue infrastructure and equipment.</li> <li>◆ Knowledge of nearest safe mounds, shelter locations.</li> </ul>
3.	Water and Sanitation Group	<ul style="list-style-type: none"> <li>◆ Manage drinking water and sanitation indoors and outdoors in Relief camps /shelters</li> </ul>

		<ul style="list-style-type: none"> <li>◆ Need training in proper hygiene and handling of water.</li> </ul>
4.	Relief Group	<ul style="list-style-type: none"> <li>◆ Collect relief material from the authorities like food, clothing, bedding, kerosene etc.</li> <li>◆ Distribution to the affected families.</li> <li>◆ Coordination of relief effort by other agencies.</li> <li>◆ Should be able to rationally assess the requirements and convey it to the authorities.</li> </ul>
5.	Shelter management Group	<ul style="list-style-type: none"> <li>◆ Very crucial in ensuring equitable and efficient running of relief camps.</li> <li>◆ Members should be respected apolitical village men and women. (More women members like Anganwadi Workers etc are preferred)</li> <li>◆ Food, water, sanitation, and medication requirements at the relief camps /shelters.</li> </ul>
6.	First Aid and Medical Group.	<ul style="list-style-type: none"> <li>◆ Equal number of male and female members preferable.</li> <li>◆ Persons with some medical./nursing knowledge desirable.</li> <li>◆ Need to be trained extensively in TRIAGE/ First - Aid procedures.</li> <li>◆ Need to liaise with and in constant interaction with local PHCs /UHCs.</li> </ul>
7.	Patrolling Group	<ul style="list-style-type: none"> <li>◆ Maintain peace and harmony in the relief camp /Shelters.</li> <li>◆ Safeguard belongings of evacuees in the camps.</li> </ul>

		<ul style="list-style-type: none"> <li>◆ Interact with policy and follow necessary directions.</li> </ul>
8.	Liaison Group	<ul style="list-style-type: none"> <li>◆ Educated (preferably XII<sup>th</sup> /graduates) persons.</li> <li>◆ Need to be educated on the inter-departmental coordination aspects of DDMP and local Taluka – level DMP.</li> <li>◆ Should be aware of all the Nodal Officers of line departments and their contact numbers/addresses.</li> <li>◆ To keep liaison with governmental and non – governmental organizations.</li> </ul>

## CHAPTER – 11

### EVACUATION PROCEDURES AND GUIDELINES

#### 11.1 Operating Procedure for Evacuation

Disasters like floods, cyclones etc invariably require evacuation of communities before-hand to safer places which are to be identified in the Taluka-level DMPs and Community based Village-level contingency plans. It is important to understand the nature of threat and the procedures to be adopted after receiving warning. All agencies involved in evacuation must have a common understanding of their roles and responsibilities in order to avoid confusion and panic behaviour. All evacuations will be ordered only by the Collector/Mamlatdar or by the SP or Fire Brigade, after consultation with the District Collector. SP should ensure appropriate security and maintenance of law and order during evacuation process and render all possible assistance to the Village level Task Force members. All voluntary evacuations should be immediately reported to the Collector or SP/

#### 11.2 General Guidelines for Evacuation:-

Any evacuation can be undertaken in an orderly and smooth manner if the background work has been done carefully. The Taluka/Village level exercise of preparation of DMPs/Contingency plans is generally expected to identify the risk prone locations and possible areas for evacuation. The local DMPs also identify the safe locations which can be used as emergency shelters/sites for temporary evacuations. The map indicating the location of flood/cyclone shelter should be with the concerned agencies responsible for this operation.

- ❖ The selection of such safe sites should be done keeping in mind the following
  - Shelter sites are within one hour's walk (5 kilometer) of dwellings.
  - The evacuation routes are away from the coast or flood-prone areas.

- Evacuation routes do not include roads likely to be submerged in flood, but may include pathways.
  
- ❖ It is the responsibility of administration to ensure proper evacuation by seeking community participation along the following lines:
  - Evacuation is undertaken with assistance from village-level Task Force members and community based Organisations (CBOs) like youth clubs for appropriate security and order.
  - Care is taken to see that evacuation routes are not blocked.
  - It is always preferable to encourage the entire family to evacuate together as a unit.
  - In case of inadequate transport or limited time, encourage community for emergency evacuation in the following order:
    - Seriously injured and sick.
    - Children Women and handicapped.
    - Old.
    - Able bodied.

(An evacuation plan on priority basis helps avoid stampede and confusion)

### **Emergency Evacuations Procedure**

Families should be encouraged to take adequate supplies of water, food, clothing and emergency supplies.

- Proper awareness should be created at the village-level and people need to be trained to assemble the following Emergency Kits on receipt of the first disaster warning.
  - Adequate supply of water in closed unbreakable containers.
  - Adequate supply of non-perishable packaged food and dry rations.
  - A change of clothing and rain gear.
  - Blankets, Plates, glasses, mugs made of plastic.
  - A battery-powered radio, torch, lantern matches.
  - Cash and jewellery.
  - Personal medicines.
  - A list of important family documents including ration card, passport, bank passbook address/telephone book (of relatives), certificates driving licence, property documents, insurance documents etc.

- Special items including foods, for infants elderly or disabled family members.
  
- o Ask people to shut off electricity, gas and water at main switches and valves before leaving.
  - Ask people to listen to a battery-powered radio and follow local instructions.
  - Secure their homes close and lock doors and windows.
  - Turns off the main water valve and electricity.
  - Leave early enough to avoid being trapped.
  - Follow recommended evacuation routes. Shortcuts may be blocked.
  - Not to move or drive into flooded areas.
  - Stay away from downed power lines.
  - Domesticated animals/livestock may be freed from their harness.
  
- o If possible, the community may be advised to carry the livestock along.

❖ **Procedure for Evacuation of Marooned Persons:**

Despite all efforts of the administration for early warning and evacuation there may be possibility of people getting marooned who will have to be rescued and evacuated to safety.

In case the administration decides to evacuate marooned persons:

- o Evacuation must be carried out within the shortest possible time
- o The marooned persons must be transferred to transit camps.
- o Marooned people must be provided water, medicines, First aid, Cooked food etc.
- o Emergency transport for the seriously injured by Motorised boats.
- o The Senior medical officer of PHC should accompany the rescue team along with required medical kit and ensure priority for shifting of those seriously injured or requiring immediate medical attention.



## CHAPTER - 12

### MEASURES TO MAKE DDMP EFFECTIVE

#### 12.1 Dissemination of DDMP:

The responsibility for dissemination of the plan is vested with DCR at the Collectorate.

In order for the DDMP to be effective it must be disseminated at two levels:

- To the district authorities, government departments, NGOs and other agencies and institutions within the district.
- To general public.

Effective dissemination of plan requires a well designed and focused training.

Training activities are to be carried out under the guidance and direction of the state-government and the Collector.

#### 12.2 Mock Drill:-

For the DDMP to be successful, it is important of mock drills of the plan be carried out in presence of and under the supervision of nodal officer deputed for District Collector. The periodicity of the mock drills should be clearly established and ideally should cover all the important aspects of the plan like preparedness, authenticity of resource inventory, institutional capacity of the various agencies, response time of the players etc.

- The mock drills should be carried out twice a year, one of which should necessarily be in the pre disaster season. The performance of the mock drill should be assessed and evaluated in the District Disaster Management Committee Meeting.
- The mock rehearsal should normally start from the District Control Room. This will help in finding out the preparedness level for the district level functionaries.

### **12.3 Plan Evaluation:**

The purpose of evaluation of DDMPs is to determine

- General understanding of the plan by the various actors.
- Understanding of the plan by the public.
- The adequacy of resources.
- Coordination between various agencies.
- Community participation
- Partnership with NGOs
- Standardization of the response procedures.

The plan shall be compulsorily reviewed and updated after every Post-disaster evaluation.

The plan can also be updated when shortcomings are observed in-

- Organizational structures.
- Available technologies
- Response mechanism following reports on drills or exercises.

### **12.4 Post-Disaster Evaluation:-**

The essence of success of any DDMP lies in the dispassionate and comprehensive Post-Disaster Evaluation after the withdrawal of relief and rehabilitation activities. The post – Disaster Evaluation should be in the nature of a post-mortem, conducted elaborately and as scientifically as possible to assess, interalia

- The nature of state intervention and support
- Suitability of the organizational structure.
- Institutional Arrangements.

- Response time of various agencies.
- Adequacy of operating Procedures.
- Monitoring mechanism.
- Information tools.
- Equipments
- Communication system etc.

Evaluation exercise may be undertaken to understand the perceptions about disaster response in terms of

- Adequacy of training
- Alert and warning system
- Control Room functions
- Communication plans
- Security
- Containment
- Recovery procedures.
- Monitoring.

### **12.5 Plan Update:**

The DDMP is a handy “Working Guide” to enable the various district level authorities to tackle any disaster situation effectively and efficiently. It will be the duty of the Collector to ensure that the DDMP is updated every year before the month of April and should be placed before the DDMA for review and approval.

The updates should be necessarily incorporate the following details:-

- Updates on resource requirements.
- Updates of resource inventory
- Updates on human resources.
- Technology to be used.
- Coordination issues.

In order to ensure that the entire administrative machinery responds in a well oiled manner to any contingency, it is essential that all the line departments like Police, P.W.D., D.H.S., Fire Services, Irrigation, Water Resources, Civil Supplies, Electricity etc prepares similar Infra-Departmental Plans on the lines of the DDMP and should also ensure that the same are updated every year before April. A soft copy of the DDMP will be available with the District Control Room, which can be obtained at any point of time and it would also ensure the easy updation of the DDMP regularly. All the line departments at the district level should have a latest copy of the DDMP with them.

## CHAPTER – 13

### DETAILS TO BE MAINTAINED AT DISTRICT LEVEL AND PERIODICITY OF UPDATES

<b>Schedule for updating the District database.</b>	
<b><u>District Database</u></b>	<b><u>Scheduled time</u></b>
Updating Rainfall Database	Fortnightly / Monthly
Updating NGOs/Voluntary Database	Quarterly
Updating Important Telephone Nos. Database	Monthly
Updating Shelter Database	Quarterly
Updating Weak & Vulnerable Points Database	Monthly
Updating Agricultural Database	½ Yearly
River System with Gauge Reading Database	Daily in Case of Emergency / Monthly
Relief Material Storage Points	Quarterly
Relief Material Stock Points	Monthly
List of Rescue Equipments	Quarterly
List of Private Equipments Holders	Quarterly
List of Task Forces	Quarterly
List of Resources / Personnel in Private	Quarterly
List of Chemical Hazard Prone Factories	Quarterly
List of Mounds / Helipads	½ Yearly
List of Talukas / G.P.s / Villages / Population	½ Yearly
Alternate Route Charts	½ Yearly
Animal Population	Yearly
Health / Police / Educational Institutions	Yearly
VHF Points	½ Yearly
Vehicle List	½ Yearly
List of Boat Points / Boatmen	½ Yearly
List of Dry Stuffs / Local Millers	½ Yearly
List of Warning Centres / Gauge Centres	½ Yearly
<b>SCHEDULE FOR UPDATING PLANS</b>	

Plans	Updating Time
District Disasters Management Plan (DDMP)	Yearly (APRIL)
Line Departments Disasters Management Plan	½ Yearly (MARCH & OCTOBER)

# ANNEXURES

## IRS Forms



3. Summary of Current Actions

a. Action already taken


b. Action to be taken


d. Difficulties if any in response including mobilization of resources and manpower




Prepared by (Name and Position):

\_\_\_\_\_  
Signature

*\*ETA: Expected Time of Arrival*

# Annexure-II

## Incident Status Summary (ISS) – IRS Form 002

(Major Components)

*Attach a separate sheet in case space is not sufficient*

<b>1. Name of the incident :</b>		<b>2. Name of the IRT:</b>			<b>2. Operational Period</b>		<b>4. Prepared</b>	
							Date:	
							Time:	
<b>5. Name of the IC: _____</b>				<b>6. Phone No. : _____</b>				
<b>7. Current Situation (Nos. of Casualty)</b>								
(a)	(b)	(c)	(d)	(e)	Dead	Identified and cremated / buried dead bodies	Un-identified dead bodies	
Locations	Injured	Treated	Discharged	Patients referred (Specify Hospitals with locations)				
<b>8. Status of Infrastructure (Put tick mark)</b>					<b>9. Threats, if any which may be increase severity of incident may be indicated</b>			
(a)	(b)	(c)	(d)					
Infrastructure	Not Damaged	Partially Damaged	Completely Damaged					
Road								
Railways								
Airport								
Water Supply								
Electricity Supply								
Communication Network								
Communities / Critical								
Residence								
Any Other (Specify)								

*Contd.....*

10. Resources deployed for response with descriptions							
(a)	(b)				(c)		(d)
Locations	Resources				ESF involved		Activities
	Human Resources	Equipments			Gov.	Non Gov.	
		Kind	Type	Quantity			
11. Need for additional resources							
(a)						(b)	
Resource Details						Source of Mobilization	
Kind			Type	Quantity			
12. Remarks if any:							

# Annexure-III

## Unit Log – IRS Form 003

(Major Components)

Attach a separate sheet if space is not sufficient

<b>1. Name of the incident:</b>		<b>2. Name of the Section:</b>	<b>3. Operational Period:</b>	<b>4. Prepared</b>	
				Date:	
				Time:	
<b>5. Name of the Units</b>	<b>6. Work Assigned with Resources</b>	<b>7. Name of the Site</b>	<b>8. Status of work</b>		
			(a)	(b)	
			Completed	Not completed	
<b>9. Specify accident / incident / weather conditions which may increase severity of incident</b>					
(a)	(b)	(c)			
<b>Time</b>	<b>Locations</b>	<b>Action taken or suggested</b>			

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Source: Adapted from ICS Form 214



# Annexure-V

## Organization Assignment List – IRS Form 005

(Major Components)

*(Attach a separate sheet if space is not sufficient)*

This assignment list will be prepared as per IAP and will be circulated among all the responders and supervisory staff at the beginning of each operational period by the respective Section chiefs.

<b>1. Name of the Incident:</b> _____	<b>2. Operational Period:</b> _____	<b>3. Prepared:</b>
		Date: _____
		Time: _____
<b>4. Name of the section to whom work assigned:</b> _____		
<b>5. Name of the supervisory Officer concerned:</b> _____		
<b>6. Name of the responder:</b> _____		
<b>7. list of task assigned</b>		
(a) _____		
(b) _____		
(c) _____		
(d) _____		
(e) _____		
(f) _____		
(g) _____		
(h) _____		
(i) _____		
<b>8. Name and designation of officer Prepared by:</b>		<b>9. Approved by:</b>

## Incident Check-in and Deployment list – IRS Form 006

(Major Components)

(Attach a separate sheet if space is not sufficient)

<b>1. Name of the Incident:</b> _____		<b>2. Name of the Section / Branch / Division / Unit and Facility:</b> _____				<b>3. Operational Period:</b> _____		<b>4. Prepared</b> Date: _____ Time: _____		
<b>5. Resource Check-in Information</b>		<b>6. Source of Mobilisation</b>		<b>7. Check-in</b>		<b>8. Status of Resources</b>				
(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(c)	(d)	(e)
Personnel	Equipment	Govt	Private	Date	Time	If still in Facility	Sick / Out of service / maintenance	Location of site if deployed (Specify)	Date	Time
	Kind      Type					<i>Put Tick mark</i>				
<b>9. Name and designation of officer Prepared by:</b>										

## Annexure-VII

### On Duty Officer List – IRS Form 007

(Major Components)

*(Attach a separate sheet if space is not sufficient)*

*This will be maintained by all the Section and sent to RO through IC*

<b>1. Name of the incident:</b> _____		<b>2. Name of Section / Branch / Division / Unit (Specify):</b> _____			<b>3. Operational Period:</b> _____		<b>4. Prepared</b>	
							Date: _____	
							Time: _____	
SI	5. Name of Officer	6. Designation in Normal Period	7. Phone No. / E-mail ID	8. IRS Position for the Incident	9. Location of Deployment	10. Location of Camp with Contact Details	11. Any other Information	

<b>12. Name and designation of officer Prepared by</b>								<b>14. Dispatch</b>	
								Date	
								Time	

## Annexure-VIII

### Medical Plan – IRS Form 008

**(Major Components)**

*Attach a separate sheet if space is not sufficient*

<b>1. Name of the incident:</b>	<b>2. Operational period:</b>	<b>3. Prepared</b>	<b>4. Total Nos. of medical aid camp to be established:</b>
		Date:	

				Time:										
4.1 Sl.No.	4.2 Location (s)	4.3 Resources Available in the medical camp												
		(a)	(b)	(c)	(d)		(e)		(f)					
		No. of Medical Officers	No. of Paramedics staff	Others (ANM & trained volunteers) Specify	life saving drugs / Appliances Yes      No		Facilities of referral services and Blood Banks Yes      No		Any other (Specify)					
5. Status of Ambulances Services				6. Availability of Regular Medical Facilities (Specify in Nos.)										
(a)	(b)	(c)		6.1 Govt					6.2 Private					
Name of the Ambulance Service Provider	Address & Contact No.	Paramedics		(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)	(f)
			No	Locations	Sub	PHC	Hospitals	Medical	Locations	Clinic	Nursing	Hospitals	Medical	RMP
7. Road map of the area circulated among the ambulance service				8. Referral Medical Facilities in the Neighborhood										
(a)		(b)		(a)				(b)				(c)		
Yes		No		Location				Address				Specialization		
9. Name and designation of officer Prepared by (Medical Unit)														

# Annexure-IX

## Communication Plan – IRS Form 009

(Major Components)

(Attach a separate sheet if space is not sufficient)

<b>1. Name of the Incident:</b>					<b>2. Operational Period:</b>					<b>3. Prepared</b>				
										Date:				
										Time:				
<b>3. List of locations where communication is available</b>														
(a)	(b)	(c)		(d)										
Name of location	Organisation	Requirement of Backup Power Supply		Type of communication										
				Wireless			Telephone			HAM Radio	Web			
				HF	VHF	Morse	Land line	Mobile	Satellite		E-mail	Skype		
		Yes	No											
<b>4. List of locations where communication has to be setup</b>														
(a)	(b)	(c)		(d)		(e)								
Name of location	Organization responsible	Requirement of Backup Power Supply		Personnel requirement (Specify Nos. if required)		Type of communication								
						Wireless			Telephone			HAM Radio	Web	
						HF	VHF	Morse	Land line	Mobile	Satellite		E-mail	Skype
		Yes	No	Yes	No									

5. Arrangements for repair and replacement of faulty sets:								6. In stock available sets (Specify Nos., kind and type):						
7. Networking plan for integrating inter-organisational communication facilities with the local setup (Army / NDRF, etc.) – weather repeater or relay setup is required or not										8. Transport requirements for supervision and maintenance:				

## Annexure-X

### Demobilisation Plan - IRS Form 010

1. Name of the incident:	2. Name of Section / Branch / Division / Unit to be demobilized (Specify): _____			3. Operational Period:		4. Prepared	
						Date:	Time:
5. Name of responder (s) / details of resources to	6. Location from where demobilization will take place	7. Date & Time	8. Mode of transport	9. Transit destination, if any	10. Final Destination & name of agency to whom returned	11. Ultimate destination agency notified or not	
						Yes	No
(a)	(b)	(c)	(d)	(e)	(f)	(g)	

(Major  
*(Attach a  
 sheet if space  
 sufficient)*)

Name of sick personnel / out of service	Location from where demobilisation will take place	Date & Time	Mode of transport	Transit destination, if any	Final Destination & name of agency to whom returned	Ultimate destination agency notified or not	
						Yes	No

Components)  
*separate  
 is not*

13. Name and designation of officer Prepared by \_\_\_\_\_

15. Issued by \_\_\_\_\_

# **APPENDIX I**

## **Incident Response Team for District,Sub division and Taluka level**

IRS Position	District Level	Sub- Division Level	Taluka Level
Incident Commander	Addl.Collector/ADM	Dy.Collector & SDM	Mamlatdar
Dy. IC	Dy.Collector	Mamlatdar	AK
Information & Media Officer	Information Officer DIP	Jt.Mamlatdar	CI
Liasion Officer	Dy.Collector I/C Disaster Management	Jt.Mamlatdar	CI
Safety Officer	Depending on the nature of the disaster respective Departmental in charges, like Health services/Police/Animal Husbandry & veterinary Services/Fire & Emergency will be the safety officer		
OPERATIONS SECTION CHIEF	Depending on the nature of the disaster respective Departmental in charges, not below the rank of Deputy Collector, like Health services/Police/Animal Husbandry & veterinary Services/Fire & Emergency		
Staging Area Manager	AK	Talathi	Talathi
Response Branch Director	Dy.SP of affected area or as deputed by RO/IC	PI of affected area	PSI of affected area

Division supervisor	ADFO	Station Officer	Station Officer
Task Force	Middle level Officer of Police, Fire, Home Guard, Electricity, WRD, PWD, DHS Forest , Fisheries,NGOs,CBOs, Etc.		
Single Resource	Field level Officer of Police, Fire, Home Guard, Electricity, WRD, PWD, DHS ,Forest Fisheries, Etc.		
Transport Branch	Dy. Director Transport	Asst. Director of Transport	Motor Vehicle Inspector/Police Inspector
Road Group			
Group Incharge	ADT	MVI	AMVI
Vehicle Co-ordinator	Motor vehicle Inspector		
Loading Unloading INcharge	Asst. Motor Vehicle Inspector		
Rail Group			
Group Incharge	Regional Manager KRC	Senior Traffic Manager KRC	Station Supt. KRC
Vehicle Co-ordinator	Senior Traffic Manager		
Loading Unloading In charge	Station Superintendent		

Water Group			
Group Incharge	Senior officer Captain of Ports	Middle Level Officer , captain of Ports	Field Officer, COP
Vehicle Co-ordiantor	Middle Level Officer , captain of Ports		
Loading Unloading INcharge	Field Officer, COP		
Air Operation Group In charge	Addl. Dist. Magistrate		
Co-ordinator Heli base	Co-ordinator, Director Airport Authority of India		
Loading Unloading Incharge	Traffic Manager, airport Authority of India		
PLANNING SECTION CHIEF	Dy. Collector (Civil Admin. Branch)	Mamlatdar	Jt.Mamlatdar
Resource Unit	Dy.Collector(Rev)	Jt.Mamlatdar	AK
Check in Status Recorder	Jt.Mamlatdar of affected area	Talathi	Talathi
Situation Unit Leader	Mamlatdar of affected area	Talathi	Talathi

Display Processor	DIO, NIC	DEO at Taluka HQ	
Field Observer	PI of affected area		
Weather observer	Senior Personnel of IMD		
Documentation Unit Leader	Dy. Collector DRO	Head Clerk/TI/Steno	
Demobilization Unit	Sr. Dy. Director of Transport	ADT	MVI
Technical Specialist	Suitable officer from Dept. from Meteorology, Fire, Forest, F& B, Health, PWD, PHD, IRRG. Etc. depending on incident		

<b>Logistic &amp; Finance Section Chief</b>	DDP/Addl. Director of Municipal Administration	BDO of the Taluka	
Service Branch Director	BDO/ CO of Municipality of the affected area	ERO	
Communication Unit	Incharge Police wireless/Dy. JTO, BSNL/Ham Operators		
Medical unit	MS Of district Hospital	Health Officer Incharge of taluka hospital /CHC/PHC	
Food Unit	Asst. Director Civil Supplies	Civil supply Inspector	
Support Branch Director	DDP/Chief Officer	BDO/ME	
Resource Provisioning Unit	SE ,PWD for Rds. & Blgs.	EE, PWD for Rds. & Blgs	AE ,PWD for Rds. & Blgs
Resource Ordering Incharge	EE, PWD (R & B)	AE PWD for Rds. & Blgs	JE, PWD for Rds. & Blgs
Receiving & Distribution in charge	Asst. Engineer PWD	JE, PWD	
Tools & Equipments Specialist	Tech. Asst. PWD/WRD/Elect.		
Facilities Unit	PO, DRDA		

Facility Maintenance Incharge	AE, PWD at Dist. HQ.		
Security Incharge	PI at Dist. HQ	PI	PI
Ground Support	EE, Vehicle Maintainenc	ITI Instructor Mechanical	
Finance Branch Director	AAO of Collectorate		
Time Unit	Sub Treasurer at District HQ	Sub Treasurer at Taluka HQ Treasury	
Compensation/Claim Unit	Head Clerk Incharge of Dist. Mgt.	Dealing Hand incharge of Dsit. Mgt.	
Procurement Unit	Mamlatdar in Collectorate	Jt.Mamlatdar	
Cost Unit	Accountant in Collectorate	Cashier	Cashier

## APPENDIX – II

### **SECTOR WISE SUB PLANS:**

#### **(a) HEALTH SERVICES:**

##### ORGANIZATION AND CONTROL

##### State Government

The Coordinating Authority at the state level will be the Director of Health Services. The Health Department through the Director of Health Services would be responsible for the following:

- a. Planning emergency health services within the state
- b. Coordinating all district plans and ensuring mutual aid and mobile support by dividing state into regions or sectors
- c. Setting up of an emergency health advisory committee for the state at the time of emergency
- d. Controlling the emergency health services within the state
- e. Making adequate provision for personnel, equipment and stores to meet any emergency
- f. Training of personnel

##### Districts

The coordinating authority here will be the District Medical Officer/Medical Superintendent of Asilo hospital/Hospicio hospital and will be responsible for all emergency Health Services in the district. Other services will be like those of the Director of Health Services but confined to his own district.

## Hospital Disaster Manual

The hospital disaster manual is written statement of disaster plan, which is activated during disaster. It can be divided into five sections.

### **Introduction**

The introduction should include disaster alert code, general principles of conduct and brief synopsis of total plan. When the alert is given all personnel must report to duty and takeover their assigned jobs.

### **Distribution of Responsibilities**

a. **Authority-and-command-nucleus:**

1. Superintendent of the hospital
2. District Health officer /civil surgeon
3. Consultant Emergency Medicine /surgery/Medicine
4. Matron

A small disaster management committee consisting of:

Should be constituted which will run the control room

b. **Action-cards**

The duties of each individual and department is put on a “action Card”

These cards describe in details the responsibilities and the actions to be taken by each and every member of hospital staff starting from hospital administration to stretcher bearers and ward boys. Action card can be carried at all times and/or kept at command.

### **Chronological action plan**

The action plan be listed in chronological order. Its salient points are as follows:

- a. **Initial-alert:** This may be received through casualty itself or through telephones or through authority like police. On receipt of this information, the concerned person must gather information regarding the place, time and type of emergency and the estimated number and type of casualty, and the sources of communication. He should also have a call back number if possible to remain in constant contact with the reporting personnel. This would help in determining the time available to prepare (reaction time) for the emergency and necessary reorganization of hospital services to cope up with the same.
- b. **Activate-hospital-action-plan:** The designated hospital staff activates the disaster plan. All the departments and people involved get into readiness to attend to casualties and depending upon the nature and the number of casualties, crisis, expansion of hospital beds is undertaken, utilizing additional space, by discharge of minor cases and transfer of cases to other hospitals.
- c. **Formulation-of-command-nucleus:** The command nucleus should be formed and locate in casualty department
- d. **Management-of-casualties:** The next phase in the hospital will involve further treatment of patients and collection of information for management, and for relatives and media.  
This deals with the admission of patients and, triage and organization of clinical services.
- e. **Hospital-management:** Once a disaster call is made and the hospital control unit is established, the mobilization of the hospital services may proceed at the speed required with minimum loss of time. Usually a number of designated areas will need to be created.

## **I Reception**

An initial reception area acts as the first point of triage in the hospital and distributes patients to appropriate treatment zones. In addition; the initial reception will involve the documentation for casualties.

The most experienced surgeons available should undertake triage, and if staffing permits, assign specific members to care of each patient needing urgent attention. Ambulatory patients and those needing less urgent care should go to a separate area to await treatment at a convenient time.

## **II Resuscitation**

A large well lit open space is needed for effective resuscitation which prepares for surgery those needing it, and allows admission to the wards, when their conditions become stable. A senior “anesthetist” is the best choice to supervise resuscitation and to prepare, with surgical advice, the theatre schedules.

## **III Operation Theatres**

Strict sorting is necessary to avoid blocking theatre space with patients with trivial injuries and who happen to arrive first. They may be treated in a separate theatre (M.O.T) or at convenient times when other major problems are dealt with. Treatment in wards or I.C units will need to be organized to follow initial care in accident department and the theatres. E.M.B. should maintain a register of such patients so that they do not get LOST.

## **IV Radiology**

Proper radiology assessment is needed for the correct management of many casualties. Strict triage for radiology should be practiced by staff to avoid bottleneck in radiology department and overuse and failure of X-ray machines or shortage of X-ray films

Portable X-ray machines would be preferred in Orthopaedic O.T and image intensifiers should be used in O.T. if available

## **V Blood Transfusion**

1. Initial replacement of blood volume can be carried out by using plasma expanders.
2. Patients having more than 9.0% Hb should not be given blood.
3. Blood is a scarce commodity and even freshly collected blood has to be now AIDS tested which requires additional facilities and time.
4. In most of the cases plasma expanders will suffice, exceptions being riots and major accidents with surgical trauma. Hence, exact policy to be used in regards to blood collection and storage should be set out in the Disaster plan.

## **VI Work load**

Major disasters can produce situations in which staff works round the clock for long hours under greater pressure. The time of continuous working by any member should be limited by I/C of units to a period acceptable for efficient function, and the rosters amended as necessary.

## **VII Training**

Disasters strike without warning and have been known to recur particular in the context of waves of urban violence. Training to cope with the disasters is thus always needed. The objectives of training are to familiarise all staff concerned with overall strategy of the accident plan and with their individual roles. In the training some parts of the plan need to be tested frequently. A disaster management drill in parts may also be carried out and deficiencies can be identified and solved before full-scale exercises are undertaken.

## **VIII Evaluation**

A system of evaluation must be built into any disaster plan to detect any deficiency in planning and training and ensure that the responses are sufficiently flexible to meet the variety of needs found at disasters.

## **IX Conclusion**

Major disasters; provide a sudden, perhaps massive, overloading of the capacity of a hospital to provide for proper quality of care of all casualties. Planning for such disasters seeks to minimize the effect of overload by ensuring specially that those in the urgent need receive treatment at the earliest possible time.

To attain this objective, it is necessary to create an appropriate command, stricture to take necessary decision, to make a reconnaissance to assess the problems and to create a triage system whereby the patients are dealt with according to the severity of the injuries. Attention to communication is vital if these functions are to be performed effectively.

Planning for major disasters must include methods for the training of the staff involved and for the evaluation of that training and of the lessons of any disaster that occur.

## MANAGERIAL ISSUES IN DISASTER MANAGEMENT

The issues could be clinical/administrative.

- a. **Clinical-issues:** Clinical issues involved the triage of the mass casualties which arrive at the hospital, the non-serious patients which arrive earlier than the serious patients and demand attention, the unknown nature of disaster specially if it is a chemical hazard and hence dilemma in treatment or specific drugs being not available and the crisis expansion of the emergency services. These and such issues should be considered and planned in advance and formulating in the disaster plan of the hospital and district.
  
- b. **Administrative-issues:** The proper execution of disaster management a disaster management team should be formed under the chairmanship of disaster control officer who should be the senior hospital administrator. Administrative issues involved are:
  1. **Documentation:** proper documentation on previously structure forms should be done to save time. The unconscious patient and those dead on arrival may pose some problems, but MLC papers should also be prepared for these. The list may be computerized, one to be kept with Medical records, second with casualty, the third with PRO and one may be sent to police/district collector for revenue records in case the question of compensation arises in future. Each patient should be tagged on arrival and a case sheet be given. The daily status reports of casualties, and deaths with their PM reports or discharges, should be recorded. At the time of discharge, a modified discharge card, with the photograph and thumb impressions of the victims may be provided so that true identity of the victims can be established later. One copy should be kept in medical records and one should be sent to revenue officers/collector to be used when deciding about compensation and other benefit claims of the victims
  
  2. **Police-Documentation:** This may be assisted by PRO and other staff not involved in medical care.

3. **Communications:** Telephone lines should be kept in order, and additional lines with restricted numbers for priority messages should be installed specially with STD facilities, with the help of telephone authorities. Such emergency lines are permissible, desirable and should be available. The communication should be maintained round the clock and all messages to be written down in the log book in details for follow –up. Wireless services with police assistance and hotline with the collector can also be used in emergency. Fax should be used for asking help about drugs equipment/appliances as detailed specification and qualities can be given on fax and there is no chance of confusion, which can occur as in telephonic conversation. Messengers may also be kept ready for use.

4. **Friends-and-relatives:** The anxious, excited friends and relatives want to know the welfare of their kith and kin and hospital authority should calm them down, consol and give them all possible details from time to time from information booth. List of patients may also be displayed with their ward location. The number of relatives attending the patients should be kept at minimum, as this adds to already crowded space and also creates problem in giving emergency care. In disasters like earthquakes where the patients and relatives have lost everything the question of giving food and clothing to these attendants also arises.

5. **Crowd Control:** Large crowds of curious people gather in hospital premises and even in reception and treatment areas. They should be controlled, evacuated and only person with authorized passes be allowed to enter the Hospital. There should only be one entry guarded by the police. This is very important as these days from the point of security and safety.

6. **Involvement of voluntary workers:** The requirement of voluntary workers and their disposition should be

decoded by the hospital administrator and if these are not required, they may be politely told that they will be called when required by the hospital. No Organization should be shown favour, as others will be hurt. Their contact numbers and the names of contact persons should be kept on records.

7. **Blood-Donation:** There is usually over response to disaster and lots of people rush to donate blood. Blood donation can be arranged as and when blood is required. And should have low priority in other disasters except riots and bomb blasts where surgical injuries are more and blood is necessary. In other situations the list of volunteers and contacts may be kept ready. Additional storages capacity for blood has to be created. AIDS testing has also to be arranged.
8. **Donation-of-foods,-clothes,-drugs,etc.:** Similarly, the response of donation of food material - cooked food, drugs etc. should also be regularized and controlled as many times the foods go waste. The medicine samples of various kinds and drugs, which are not wanted, are also donated in assorted quantities. This creates problems in inventory, storage, utilization as well as quality control. It was observed that substandard drugs or even near expiry of expired drugs have been donated.
9. **Patient's-Property:** The normal procedure of listing every single item of patient's property is not practicable in disaster. A large polythene bag should be kept separately. The property of each patient admitted with identification tags inside. It can later be sorted and listed in the wards. Care should be taken to see that valuables and cash are not pilfered.

10. **Press-and-Broadcasting-service:** There should be only one person to give press release in hospital. People should be discouraged to give interviews and their personal opinions as it can create confusion and mislead the lay people and even authorities.
11. **Ambulance-Service:** Ambulance vans of hospital should be maintained in order and additional vans can be requisitioned from nearby hospitals and social organizations. These are to be kept under control of one person, stationed in control room, who would only authorize their trips. The drivers and the attendants must be sitting in the vans all the time.
12. **Emergency-Light:** Arrangement for additional lights in triage area, treatment area, and maintenance of continuous to X-ray department and OT and blood Bank should be ensured. Generator should be installed immediately. Reception area and approach road for ambulances should be well lighted.
13. **Disposal-of-Dead:** The arrangement for prompt disposal of dead should be made, since at times, the hospital mortuary may not be able to cope up with large no of dead bodies and which may pose public relations and public health problems
14. **V.I.P-visits:** As far as possible, these should be avoided during first few days as it interferes with hospital work and entails additional security problems, involves E.M. physicians with non-productive activities. Later on also, visits by various political and social organization or their spokesman should be discouraged or arranged to suit hospital convenience and not theirs
15. **Teams-of-doctors-and-other-professionals:** The word should be passed that unless asked for or appealed such teams should not on their own rush to the site. As it hampers rescue work and many times they have no work and get dissatisfied.

## **The checklist of manpower, drugs and equipment.**

### **Manpower**

For managing the disaster, following categories of additional staff may be required:

1. Doctors both male and female including specialists and District Health Officer.
2. Nurses fully trained.
3. Auxiliary Nurse Midwives (ANMs), L.H.Vs, Health supervisors, Health Inspectors and H.W.(M)
4. Pharmacists and compounders
5. Dressers
6. X-ray, Laboratory And Dressers
7. Class IV Employees
8. Stretcher bearers
9. District Media and Information officers
10. General duty personnel-Drivers, Social workers and administrative officer
11. Secretarial personnel-clerks, accountants, store-keepers
12. Cooks, dhobis and sweepers

The C.M.O/D.H.O/ Med.Suptd. Should ensure the above staff availability by commissioning them from C.H.Cs/P.H.Cs, voluntary organizations and from private practitioners.

### **List of Medicines**

1. Inj. Hydrocortisone

2. Inj. Dexamethasone
3. Inj. Mephentine
4. Inj. Adrenaline
5. Inj. Mannitol
6. Inj. Antihistamine
7. Inj. Xylocaine
8. Inj. Pethidine/morphine/Fortwin
9. Disposable I.V.sets
10. Disposable syringes 10ml/5ml/2ml
11. Disposable needles No 21,22,23
12. I.V Fluids
  - i. " Dextrose 5%
  - ii. " Dextrose saline
  - iii. " Isotonic Saline
13. Savlon
14. Tincture Benzoin
15. Xylocaine Skin Ointment
16. Eye and Ear Ointment

**List of instruments/equipment's**

1. Endotracheal tube/Laryngoscope
2. Tracheostomy set

3. Venesection tray complete
4. Ambu's bag
5. Airways with tongue clip
6. Oxygen cylinders with face mask, pressure gauge and flow meter
7. Artery forceps
8. Suturing needles
9. Tourniquets
10. Splints
11. Cotton
12. Bandages
13. Suction Machine (foot operated)
14. B.P. Apparatus
15. Stethoscope, torch and hammer
16. Ryle's tube
17. Foley's catheter and rubber catheter
18. Kidney tray and urine bottle
19. Band aids of different sizes
20. Crepe bandages and elastic bandages
21. Scissors with sticking plaster
22. Blood donation and transfusion sets

**Activation of Operational plan:**

**The injuries expected are mostly Burns, fractures, soft tissue injuries, asphyxia etc.**

On receiving an alert regarding Mass Casualty/Disaster, following actions are to be taken:

1. Casualty Staff Nurse on duty will inform the Medical Officer on duty/Casualty Ward Sister/OPD Ward Sister/Night Super/Matron. She will try to find out the number of casualties needing medical attention. She will try to assess the situation if possible She will note down the call back number for more information in future.
2. Senior most nurse/Ward Sister will alert X-ray department/ technician OT, Laboratory, Pharmacy and Ambulance Driver. She will also mobilize additional nursing staff and servants.
3. The senior most nurse/Ward Sister will then inform the heads of Departments of Surgery, Medicine Orthopaedic, Anesthesiology, radiology etc.
4. Casualty Medical Officer will try to assess the situation and call back on the given number if required to get additional inputs regarding place, time, estimated number of casualties. He will inform the PRO team.
  
5. Medical Superintendent/Health Officer/senior most Medical Officer takes control of the 'command nucleus' and the staff is put into action as per their action cards.
6. Small teams will be formed to execute the tasks like,
  - a. Expansion of hospital beds
  - b. Discharge of patients, Classification of patients, who need attention at OPD level only, who can be discharged after first aid, patients who need investigations, patients needing urgent care/surgery etc.
  - c. Referral
  - d. Disposal of dead bodies.
7. Administrative staff will help to make arrangements for:
  - a. Registration
  - b. Documentation
  - c. Crowd control with the help of Police.
  - d. Organizing the help from volunteers
  - e. Blood donations
  - f. Help from private hospitals

- g. Arranging transport.
- 8. Once all these arrangements are done MS/HO will inform the Director of Health Services, who is the State Authority for Coordinating Committee for Disaster management.
- 9. Depending on the magnitude of the disaster MS/Asilo Hospital/Hospicio Hospital, who is the Coordinating Authority for the district will decide and call for help from the neighboring PHCs/CHCs.

**Stock Position**

No	Item	Asilo Hospital	Hospicio Hospital
1	Stretchers	13	10
2	Wheel chairs	6	20
3	Ambulances	1	4
4	Mobile phones for CMO & Nodal Officer	0	0

Medical Superintendents of District Hospitals may be provided with Mobile Phones for effective communication.

For the city of Panaji, Dy. Director (Public Health) will be the Nodal Officer. He will coordinate with the Health officer of Urban Health Center Panaji and Medical Superintendent, Goa Medical College, Bambolim

Director of Health Services has written to the President of Association of Private Nursing Homes, Goa, requesting them to keep beds reserved for emergencies.

The President and Secretary of the Association have responded promptly to the request assuring all help and co-operation to provide services as required, if need arises.

The above plan is prepared keeping in mind the possibility of man made disaster like bomb blast resulting in mass casualties, which may cause loss of life of around 30-40 people& other injuries for 100 people.

Bomb blasts are usually in series and multiple and usually with time interval of half an hour to one hour, therefore unless confirmed Nodal Officer from PHCs should not leave their Head Quarters.

## **Action by State Control Room**

**1. Procurement of Medicines if required**

Action by: Dy. Director (Medical), Chief Pharmaceutical Chemist

**2. Assessment of Sanitation and Hygienic conditions:**

Action by: Dy. Director (Public Health)

**3. Suitability of Drinking Water (Testing of water samples)**

Action by: State Epidemiologist

**4. Vaccination**

Action by CMO, Family Welfare Bureau

5. **Intersectoral coordination, Interstate Coordination (incase border areas are affected)**

Action by: Director of Health Services & State Epidemiologist

**Mobilization of Assistance from External Agencies**

**Communication:**

Additional lines for priority messages may be installed.

Wireless services with police assistance may be provided.

Collector should allow use of Hotline.

Fax facilities also may be provided when needed.

**Crowd Control:**

Police manpower may be provided to control the curious large crowds at the entry & exit gates. This is very essential from the point of security and safety.

**Emergency Light:**

Collector/Dy. Collector may help with additional requirement for generators if any.

**Disposal of Dead bodies:**

When the cause of death is well known, the authority should allow speedy disposal of dead bodies without resorting to *post mortem*. Otherwise may pose a public relations and public health problems.

Concerned Municipalities / Panchayats may be contacted for speeding up the process.

**Drinking Water:**

District authority may help with the provision of drinking water.

**Ambulances:**

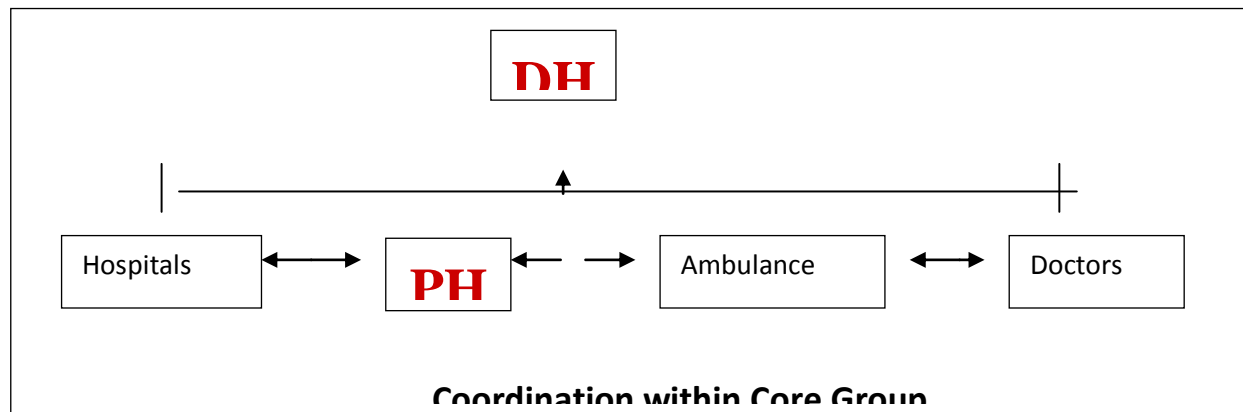
Directorate of Health Services has limited number of ambulances, however during disaster ambulances from nearby PHCs can be mobilized. Also ambulances with Fire Brigade and Police Department have to be mobilized.

**Conclusion - Our District Hospitals and PHCs have responded promptly to the emergencies in the past and have earned reputation. To enhance our commitment**

**to the cause we have started getting prepared with utmost dedication. All mechanisms have been activated and would be in action at the earliest alert.**

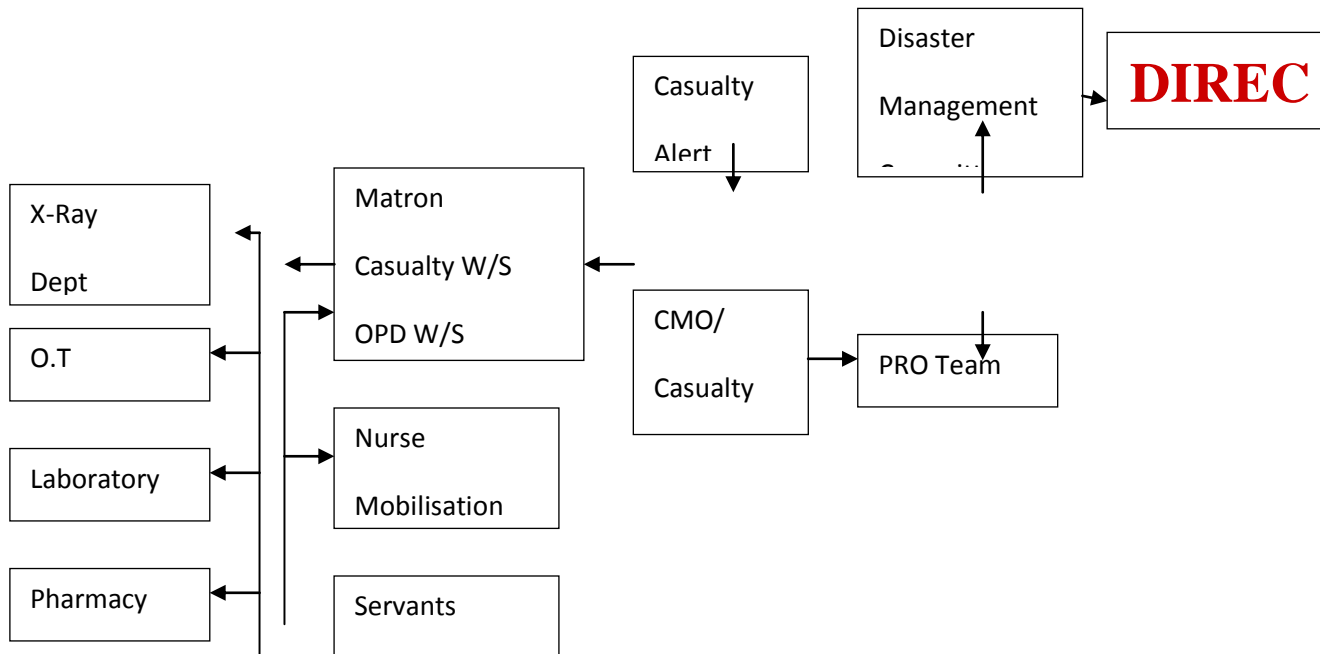
It is hoped that we will be serving the people in the hour of need, with the help, support and co-operation of all concerned.

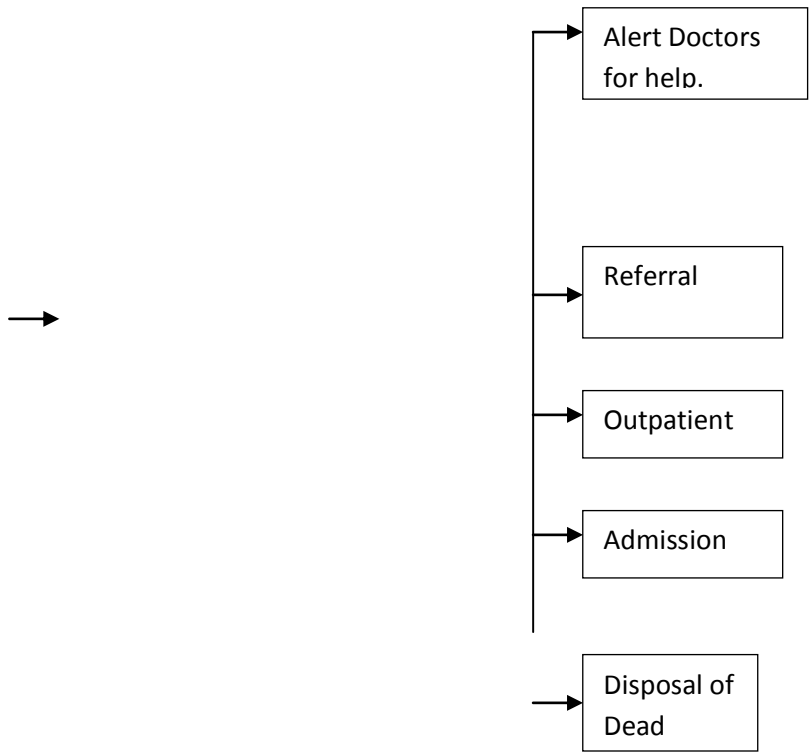
**Medical Core Group**





Mass casualty /Disaster Management Plan for District Hospital







(b) **CIVIL SUPPLIES AND CONSUMER AFFAIRS**

I. **Aims and objectives of the Department:**

The Department of Civil Supplies and Consumer Affairs is dealing with the supply of Controlled commodities, viz. rice, wheat, levy sugar and kerosene to the consumers in the State under the Targetted Public Distribution System. The Department is committed to implement TPDS to the best advantage of the beneficiaries with full transparency and efficiency of operations and accountability of the authorities implementing it.

Besides, this role the Department is also committed to protect and guard the interest of the consumer in Goa under Consumer Protection Law.

II. **Role of the Department**

As per the Disaster Management Plan of Goa formulated by the Government the role of the Department is limited.

During emergency situation the Department has to make arrangement for providing food grains to victims affected by disaster.

**The Department of Civil Supplies and Consumer Affairs issue rice to the victims as an emergency aid from the respective Taluka Civil Supplies godowns and the cost is borne by the Government of Goa.**

### **III. Procedure involved in distribution of PDS:**

The Headquarter of the Civil Supplies Department is located in Panaji. It has got its field staff working in all eleven talukas which are directly under the control of the Mamlatdars. The Mamlatdars of the Taluka/Inspectors of Civil Supplies is incharge for distribution of the essential commodity under the PDS System.

The essential commodities viz. the rice and wheat are brought to the State of Goa by the Food Corporation of India (FCI) as per the allotment made of Government of India and stored in their godowns at Sada Depot, Vasco-da-Gama.

These commodities are lifted by the Department through the transport contractors and stored in Civil Supplies godowns located in all Eleven Talukas of the State. Same is lifted by the Fair Price Shops as per the quota allotment made by the Department every month and then distributed to the Consumers.

### **IV. Action Plan of the Department in case of Disaster:**

The Department of Civil Supplies has made adequate arrangements to provide food grains (rice) to the disaster affected victims for North Goa District. Department has reserved stock of 5 MTs. of rice in Civil Supplies Godown at Sanquelim in Bicholim Taluka to be distributed to the victims of North Goa District during any eventualities.

The Mamlatdar of the Taluka Bicholim under whose jurisdiction the aforesaid godown is located has been instructed to direct the godown keepers to issue rice from their respective godowns as per the requirement and orders from the District Collector.

The Mamlatdar of the Taluka has been informed about the reservations of rice and requested to issue necessary instructions to the concerned authorities to make necessary arrangements for transportation of rice to affected areas for distribution during the disaster

5 MTs. of rice stored in Civil Supplies godowns Sanquelim in Bicholim Taluka (North Zone) to meet an eventualities.

### **(c) ANIMAL HUSBANDRY & VETERINARY SERVICES**

#### **Preparedness Plan –**

The Department has stock of vaccines like HS & BQ, FMD, Anthrax, Enterotoxaemia vaccines to be utilized during epidemics. The whole area reported under epidemic or disaster will be quarantined and preventive measures will be taken in all the neighbouring areas. Treatment will be undertaken by the Departmental Area Officers under the guidance of the Disaster Management Committee of the Department.

The Department is fully prepared to meet any eventuality as it has a Central Store which is fully equipped with all life saving drugs, vaccines for taking up preventive measures and disease investigation unit to identify the disease.

#### **EVACUATION PLAN:-**

The evacuation of animals will be done by road. Vehicle such as tempo, pickups and trucks will be utilized for the purpose. In case of large animals carcasses, cranes will be used to lift the carcasses and showels from Agriculture Department will be deployed. The assistance of the NGOs dealing with Animal Welfare activities and Fire Services will be taken in evacuation of animals.

## **RESOURCES/EQUIPMENT AVAILABLE FOR DEPARTMENT AT DISTRICT AND FIELD LEVEL.**

### **The checklist of manpower, drug and equipments**

#### **Manpower**

For managing the disaster, following categories of additional staff may be required:

1. Veterinary Doctors
2. Veterinary Assistants
3. Attendant Dressers/Bull Attendants
4. General duty personnel-Drivers, NGOs and Administrative Officer
5. Secretarial personnel- clerks, accountants, storekeepers

#### **ROLE & RESPONSIBILITY OF DEPARTMENT:**

## **Activation of Operational plan**

### **The injuries expected are mostly burns, fractures, soft tissue injuries, asphyxia etc.**

On receiving an alert regarding Disaster, following actions are to be taken:

1. Official on duty will inform the Veterinary Officer/ Assistant Director on duty.
2. Local Veterinary Officer will try to assess the situation and call back on the given number if required to get additional inputs regarding place, time, estimated number of casualties. He will inform the State Nodal Officer.
3. Area Veterinary Doctor takes control of the situation and the staff is put into action as per action plan.
4. Administrative staff will help to make arrangement for:
  - a. Registration
  - b. Documentation
  - c. Organizing the help of police, NGOs and Fire brigade
5. Once all these arrangements are done the State Nodal Officer will inform the Director of Animal Husbandry & Veterinary Services who is the Member of State Authority Coordinating Committee for Disaster management.
6. Depending on the magnitude of disaster the Assistant Director, Veterinary Hospital Tonca Caranzalem/Veterinary Hospital Sonsodo, Salcete and Assistant Director, Incharge Cattle Farms, Poultry and Piggery Farm will coordinate and decide or call for help from the neighboring Veterinary Dispensaries.

**The Director, Assistant Director(AH)-Nodal Officer, Assistant Director(DIU), Assistant Directors of Veterinary Hospitals- Margao/Tonca Hospitals and Assistant Directors Incharge of Cattle, Piggery & Poultry Farms may be provided with mobile phones for effective communication.**

For the city of Panaji, Assistant Director, Veterinary Hospital, Tonca will be nodal Officer.

## **Mobilization of Assistance from External Agencies**

### **Communication:**

Additional lines for priority message may be installed.

Wireless services with police assistance may be provided.

Fax facilities also may be provided when needed.

### **Crowd Control:**

Police manpower may be provided to control the curious large crowds at the entry & exit gates. This is very essential from the point of security and safety.

### **Emergency Light:**

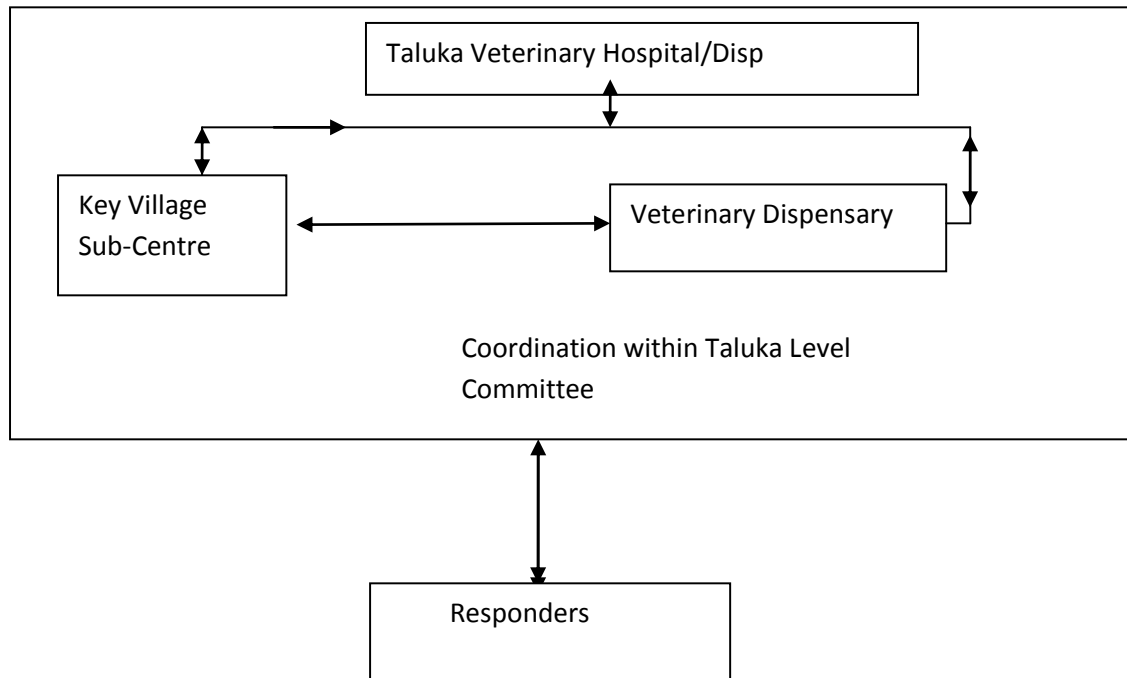
Collector/ Dy. Collector may help with additional requirement for generators if any.

### **Disposal of Dead bodies of livestock:**

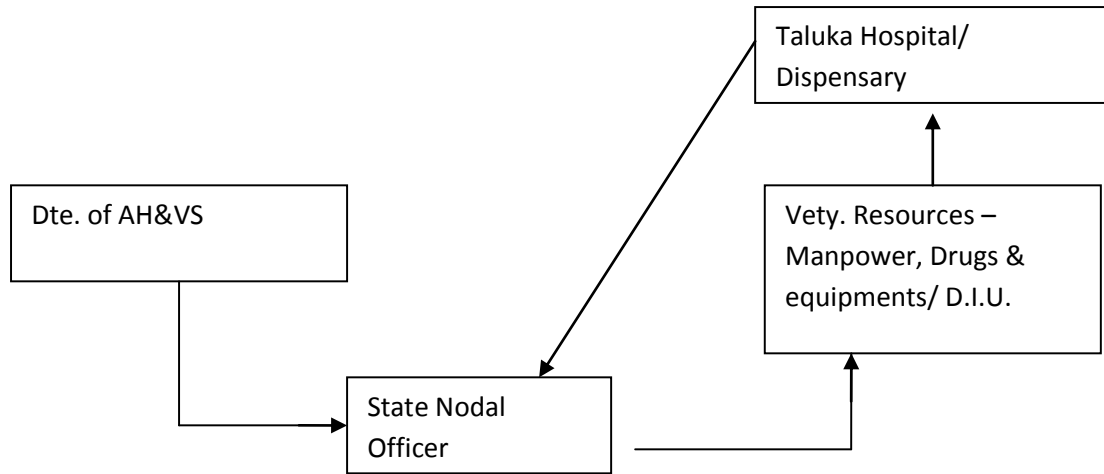
When the cause of death is well known, the authority should allow speedy disposal of dead bodies of the livestock without resorting to *post mortem*. Otherwise the decomposition of the carcass may pose a public health problem.

Concerned Municipalities/Panchayats may be contacted for speeding up the process and help disposal of carcasses.

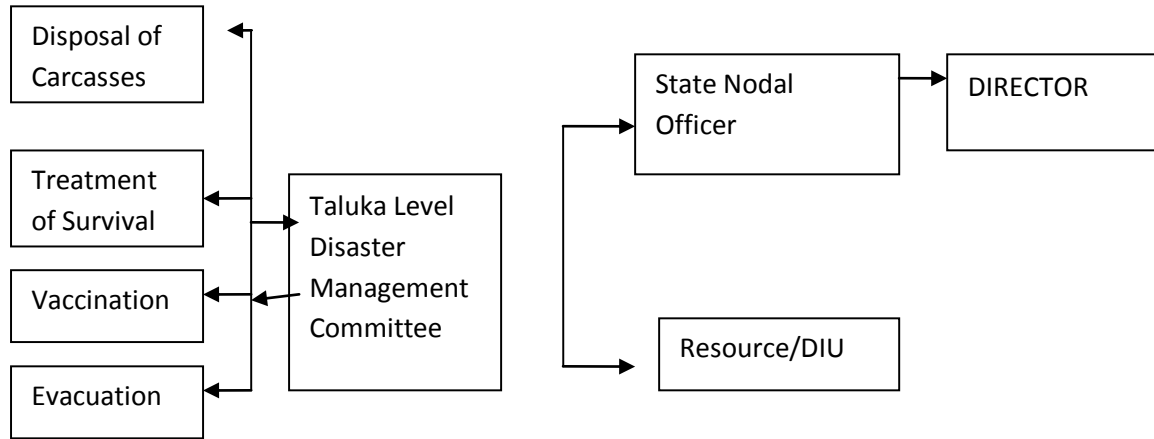
### **Taluka Level Committee**



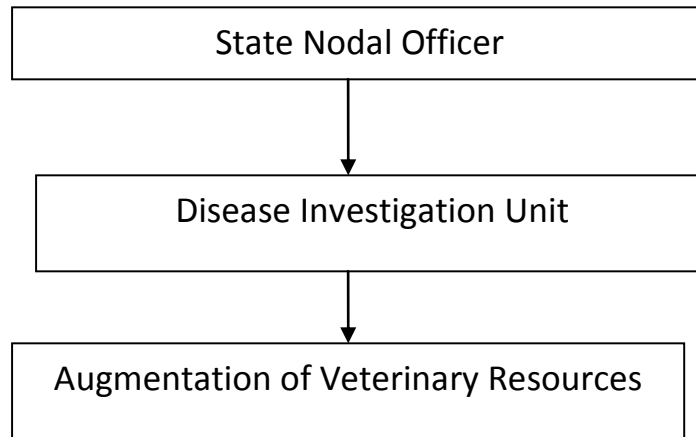
**Veterinary Services Communication Core Group**



**Mass casualty/Disaster Management Plan for Taluka Veterinary Hospital/Dispensary**



**Veterinary Services Action at site of Disaster**



- Render Local First Aid in the field
- Stage a Treatment centers in Near Scene Areas if required
- Formal treatment from Veterinary sub-centers, Veterinary Dispensaries and Veterinary Hospitals.
- Keep ready emergency Medicine Protocols from the Central Stores, Panaji

## **ORGANISATION AND CONTROL**

### **State Government**

The Coordinating Authority at the state level will be the Director of Animal Husbandry & Veterinary Services. The Animal Husbandry & Veterinary Services Department would be responsible for the following:

- a. Planning emergency veterinary health services within the State.

- b. Coordinating all district plans and ensuring mutual aid and mobile support by dividing state into regions or sectors.
- c. Setting up of an emergency veterinary health advisory committee for the state at the time of emergency.
- d. Controlling the emergency veterinary health services within the State.
- e. Making adequate provision for personnel, equipment and stores to meet any emergency.
- f. Training of personnel.

### **Districts**

The coordinating authority here will be the Assistant Director, Veterinary Hospital Tonca Caranzalem for North Goa District and Assistant Director, Veterinary Hospital Sonsodo, Raia Salcete for South Goa District.

### **Veterinary Hospital/Cattle,Piggery,Poultry Farms Disaster Manual**

The Veterinary hospital disaster manual is written statement of disaster plan, which is activated during disaster. It can be divided into five sections:

#### **Introduction**

The introduction should include disaster alert code, general principles of conduct and brief synopsis of total plan. When the alert is given all personnel must report to duty and takeover their assigned jobs.

#### **Distribution of Responsibilities**

**a. Authority-and-command-nucleus:**

A small disaster management committee consisting of:

1. Assistant Director of the Area Veterinary Hospital\_Cattle, Piggery,  
Poultry Farms
2. Veterinary Officer of the Area Veterinary Dispensary
3. Veterinary Assistant of the Key Village Sub Centre
4. Bull Attendant/Attendant Dresser.

Should be constituted which will run the control room.

**b. Action-cards**

The duties of each individual and department is put on a “action Card”. These cards described in details the responsibilities and the actions to be taken by each and every member of staff starting from administration to lower Group “D” staff. Action card can be carried at all times and/or kept at command.

**Chronological action plan**

The action plan be listed in chronological order. Its salient points are as follow:

**a. Initial alert**

This may be received through telephones or through authority like police. On receipt of this information, the concerned person must gather information regarding the place, time and type of emergency and the estimated number and type of casualty, and the sources of communication. He should also have a

call back number if possible to remain in constant contact with the reporting personnel. This would help in determining the time available to prepare (reaction time) for the emergency and necessary reorganization of Veterinary Health services to cope up with the same.

***b. Activate-hospital-action-plan:***

The designated veterinary staff activates the disaster plan. All the departments and people involved get into readiness to attend to casualties and depending upon the nature and the number of casualties, crisis, expansion of hospital facility is undertaken, utilizing additional space, by discharge of minor cases and transfer of cases to other veterinary hospitals.

***c. Formulation-of-command-nucleus:***

The command nucleus should be formed and locate in casualty department.

***d. Management-of-casualties***

The next phase in the veterinary hospital will involve further treatment of affected livestock and collection of information for management and for owners of livestock and media.

***e. Hospital-management***

Once a disaster call is made and veterinary hospital control unit is established, the mobilization of the Veterinary hospital services may proceed at the speed required with minimum loss of time. Usually a number of designated areas will need to be created.

***I Reception***

An initial reception area acts as the first point of triage in the Veterinary Hospital and distributes livestock to appropriate treatment zones. In addition, the initial reception will involve the documentation for casualties.

## **II Operation Theatres**

Strict sorting is necessary to avoid blocking theatre space with livestock with trivial injuries and who happen to arrive first. They may be treated in a separate theatre or a convenient times when other major problems are dealt with. Treatment in wards will need to be organized to follow initial care.

## **III Radiology**

Proper radiology assessment is needed for the correct management of many casualties. Strict triage for radiology should be practiced by staff to avoid bottleneck in radiology department and overuse and failure of X-ray machines or shortage of X-ray films

## **IV Workload**

Major disasters can produce situations in which staff works round the clock for long hours under greater pressure. The time of continuous working by any member should be limited by Incharge of units to a period acceptable for efficient function and the rosters amended as necessary.

## **V Training**

Disasters strike without warning and have been known to recur particular in the context of waves of urban violence. Training to cope with the disasters is thus always needed. The objectives of training are to familiarize all staff concerned with overall strategy of the accident plan and with their individual roles. In the training some parts of the plan need to be tested frequently. A disaster management drill in parts may also be carried out and deficiencies can be identified and solved before full-scale exercises are undertaken.

## **VI Evaluation**

A system of evaluation must be built into any disaster plan to detect any deficiency in planning and training and ensure that the responses are sufficiently flexible to meet the variety of needs found at disasters.

## **VII Conclusion**

Major disasters provide a sudden, perhaps massive, overloading of the capacity of a hospital to provide for proper quality of care of all casualties. Planning for such disasters seeks to minimize the effect of overload by ensuring especially that those in the urgent need receive treatment at the earliest possible time.

To attain this objective, it is necessary to create an appropriate command, structure to take necessary decision, to make a reconnaissance to assess the problems and to create a triage system whereby the livestock are dealt with according to the severity of the injuries. Attention to communication is vital if these functions are to be performed effectively.

Planning for major disasters must include methods for the training of the staff involved and for the evaluation of that training and of the lessons of any disaster that occur.

## **MANAGERIAL ISSUES IN DISASTER MANAGEMENT**

The issues could be clinical/administrative

### **a. Clinical-issues**

Clinical issues involved the triage of the mass casualties which arrive at the Veterinary hospital/dispensary, the non-serious livestock which arrive earlier than the serious livestock and demand attention, the unknown nature of disaster especially if it is a chemical hazard and hence dilemma in treatment or specific drugs being not available and the crises expansion of the emergency services. These and such issues should be considered and planned in advance and formulating in the disaster plan of the veterinary hospital and district.

### **b. Administrative issues:**

The proper execution of disaster management a disaster management team should be formed under the chairmanship of disaster control officer who should be the senior departmental officer of the rank of Deputy Director. Administrative issues involved are:

#### **1. Documentation:**

Proper documentation on previously structure forms should be done to save time. The unconscious patient and those dead on arrival may pose some problems, but MLC papers should also be prepared for these. The list may be computerized, one to be kept with Medical records, second with casualty, the third with PRO and one may be sent to police/district collector for revenue records in case the question of compensation arises in future. Each patient should be tagged on arrival and a case sheet be given. The daily status reports of casualties and deaths with their PM reports or discharges should be recorded. At the time of discharge, a modified discharge card with the photograph and thumb impression of the victims may be provided so that true identity of the victims can be established later. One copy should be kept in medical records and one should be sent to revenue officers/collector to be used when deciding about compensation and other benefit claims of the victim.

#### **2. Police-Documentation:**

This may be assisted by PRO and other staff not involved in medical care.

### **3. Communications:**

Telephone lines should be kept in order, and additional lines with restricted numbers for priority messages should be installed especially with STD facilities with the help of telephone authorities. Such emergency lines are permissible, desirable and should be available. The communication should be maintained round the clock and all messages to be written down in the log book in details for follow-up. Wireless services with police assistance and hotline with the collector can also be used in emergency. Fax should be used for asking help about drugs equipment/appliances as detailed specification and qualities can be given on fax and there is no chance of confusion, which can occur as in telephonic conversation. Messengers may also be kept ready for use.

### **4. Medicines etc.**

Similarly, the medicines should also be regularized and controlled. The medicine samples of various kinds and drugs, which are not wanted should be kept separately or else this creates problems in inventory, storage, utilization as well as quality control.

### **5. Press-and-Broadcasting-service:**

There should be only one person to give press release. People should be discouraged to give interviews and their personal opinions as it can create confusion and mislead the lay people and even authorities.

### **6. Vehicles Service:**

Vehicles should be maintained in order and additional vehicles can be requisitioned from nearby hospitals and if need be taken on contract. These are to kept under control of one person, stationed in control room, who would only authorize their trips. The drivers and the attendants must be sitting in the vans all the time.

### **7. Emergency-Light**

Arrangement for additional lights in triage area, treatment area and maintenance of continuous to X-ray department and OT should be ensured. Generator should be installed immediately. Reception area and approach road for ambulances should be well lighted.

## **8. Disposal of Dead Livestock**

The arrangement for prompt disposal of the dead livestock should be made.

## **Activation of Operational plan**

**The injuries expected are mostly burns, fractures, soft tissue injuries, asphyxia etc.**

**On receiving an alert regarding Disaster, following actions are to be taken:**

7. Casualty staff/Official on duty will inform the Veterinary Officer/ Assistant Director on duty.
8. Casualty Veterinary Officer will try to assess the situation and call back on the given number if required to get additional inputs regarding place, time, estimated number of casualties. He will inform the PRO team.
9. Assistant Director Area Veterinary Hospital takes control of the command nucleus' and the staff is put into action as per their action cards.
10. Small team will be formed to execute the tasks like,
  - a. Expansion of hospital rooms.
  - b. Discharge of patients, Classification of patients, who need attention at OPD level only, who can discharge after first aid, patients who need investigations, patients needing urgent care/surgery etc.
  - c. Referral
  - d. Disposal of dead bodies of Livestock.

11. Administrative staff will help to make arrangement for:
  - a. Registration
  - b. Documentation
  - c. Crowd control with the help of police.
  - d. Organizing the help of police
  - e. Help from private Veterinary clinics, if required
  - f. Arranging transport
12. Once all these arrangements are done Area Assistant Director (Hospital) will inform the Director of Animal Husbandry & Veterinary Services who is the State Authority for Coordinating Committee for Disaster management.
13. Depending on the magnitude of disaster Assistant Director, Veterinary Hospital Tonca Caranzalem/Veterinary Hospital Sonsodo, Salcete and Assistant Director, Incharge Cattle Farms, Poultry and Piggery Farm who is the Coordinating Authority for the district will decide and call for help from the neighboring Veterinary Dispensaries.

**Assistant Directors of Veterinary Hospitals-Margao/Tonca Hospitals and Assistant Directors Incharge of Cattle, Piggery & Poultry Farms may be provided with mobile phones for effective communication.**

For the city of Panaji, Assistant Director, Veterinary Hospital, Tonca will be nodal Officer. He will coordinate with the Veterinary Officer of concerned area Veterinary dispensary.

*The above plan is prepared keeping in mind the possibility of man made disaster like bomb blast resulting in mass casualties, which may cause loss of life of around 30-40 Livestock other injuries for 100 livestock.*

*Bomb blast are usually in series and multiple and usually with time interval of half an hour, therefore unless confirmed Nodal Officer from Veterinary Hospitals should not leave their Head Quarters.*

### **Action by State Control Room**

**1. Procurement of Medicine if required**

Action by: Dy. Director(SLBP) Head Office

**2. Assessment of Sanitation and Hygienic condition”**

Action by: Dy. Director (Epidemiology) Head Office

**3. Vaccination**

Action by; Assistant Director, Central Stores Veterinary Hospital Tonca

4. **Intersectoral coordination, interstate Coordination (incase border areas are affected)**

Action by: Director of Animal Husbandry & Veterinary Services.

## **Mobilization of Assistance from External Agencies**

### **Communication:**

Additional lines for priority message may be installed.

Wireless services with police assistance may be provided.

Fax facilities also may be provided when needed.

### **Crowd Control:**

Police manpower may be provided to control the curious large crowds at the entry & exit gates. This is very essential from the point of security and safety.

### **Emergency Light:**

Collector/ Dy. Collector may help with additional requirement for generators if any.

### **Disposal of Dead bodies of livestock:**

When the cause of death is well known, the authority should allow speedy disposal of dead bodies of the livestock without resorting to *post mortem*. Otherwise may pose a public relations and public health problems.

Concerned Municipalities/Panchayats may be contacted for speeding up the process.

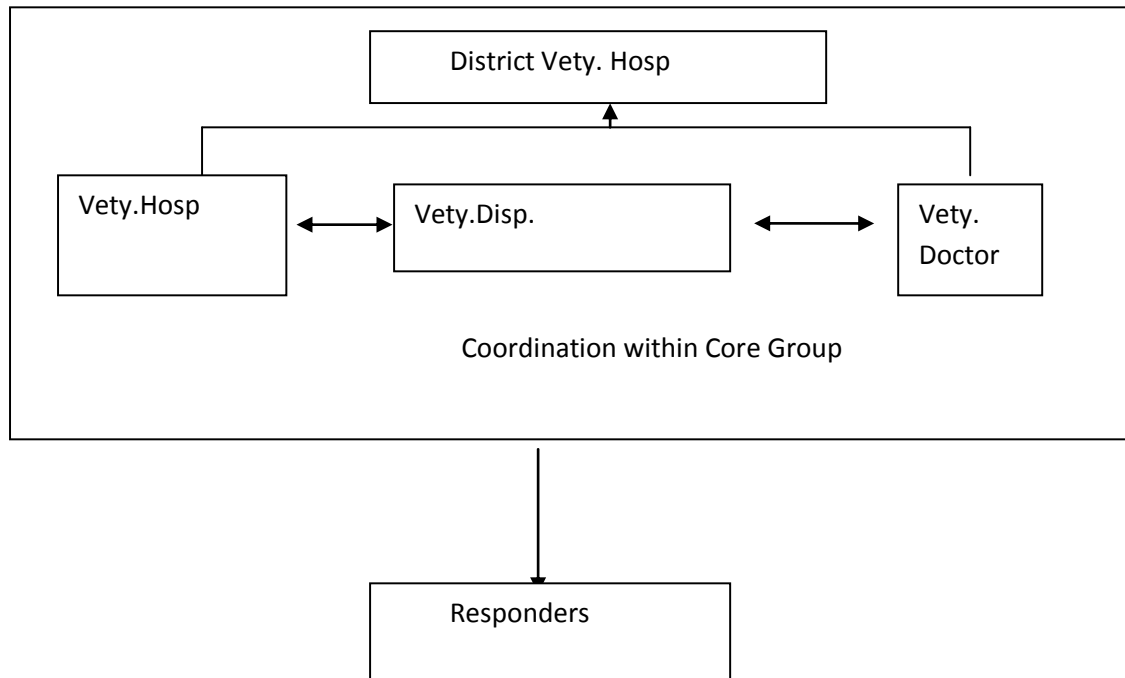
### **Drinking Water:**

District authority may help with the provision of drinking water.

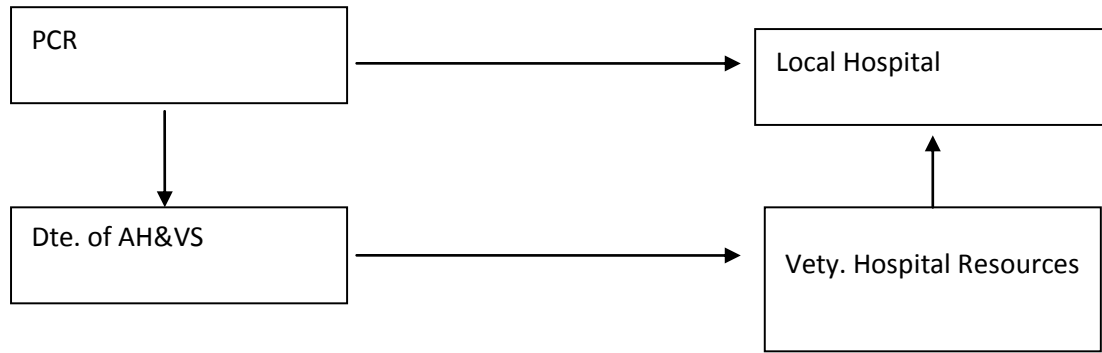
### **Ambulances:**

Directorate of Animal Husbandry & Veterinary Services Panaji has limited number of vehicles however during disaster vehicles from nearby Veterinary Dispensaries can be mobilized. Also ambulance with Fire Brigade and Police Department have to be mobilized.

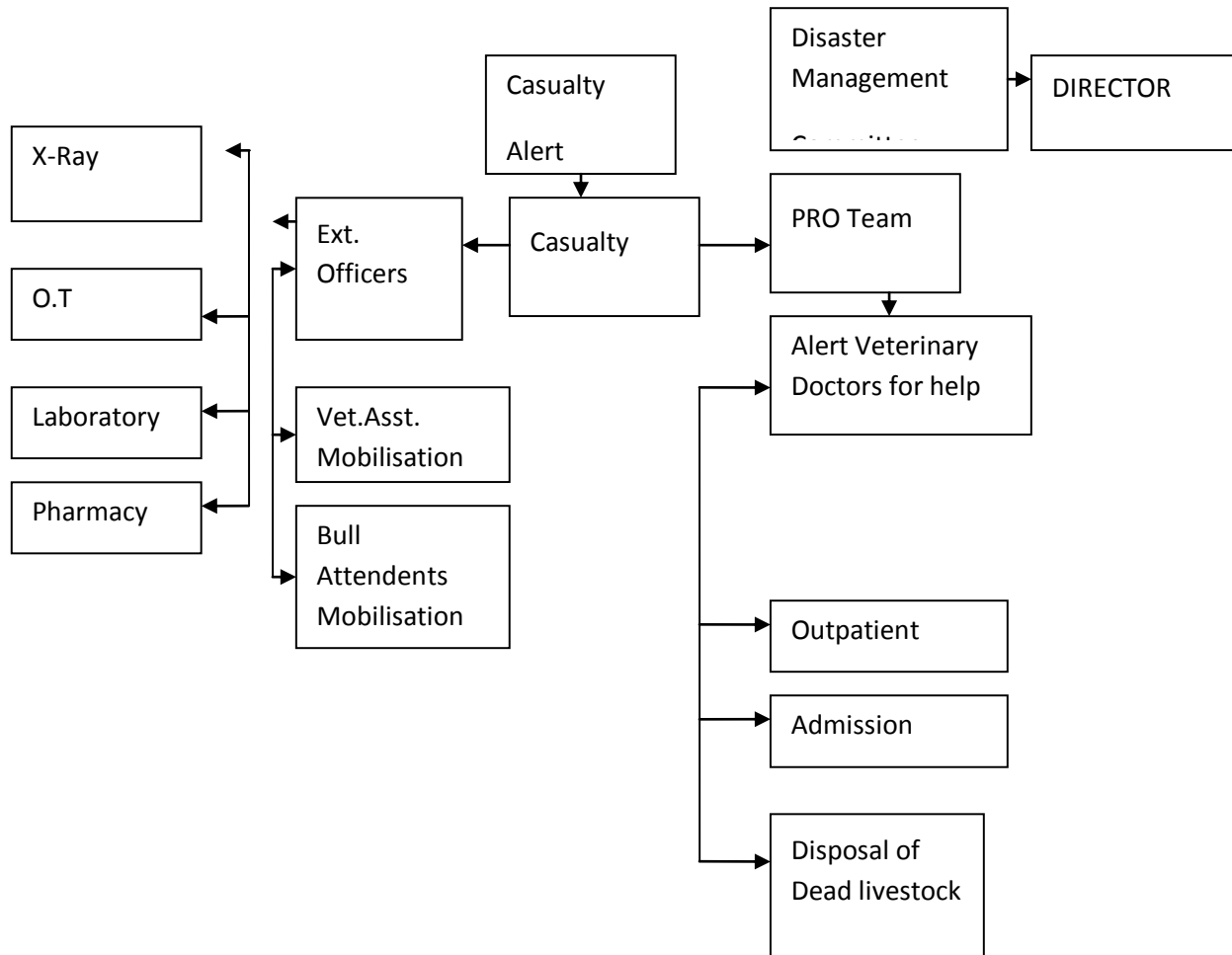
## **Veterinary Core Group**



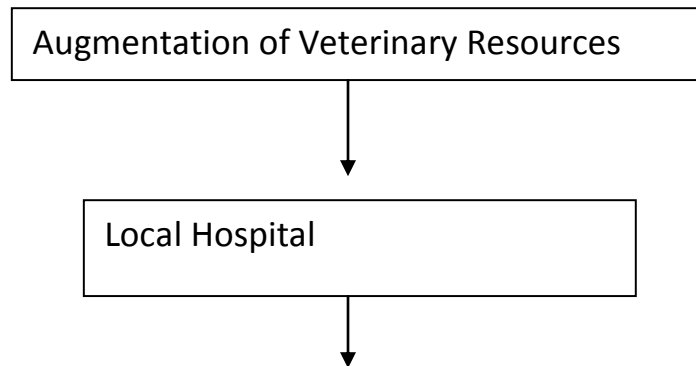
**Veterinary Services Communication Core Group**



**Mass casualty/Disaster Management Plan for District Veterinary Hospital**



## Veterinary Services Action Core Group



Render Local First Aid in the field if required

- Stage Treatment centers in Near Scene Areas
- Formal treatment in Veterinary sub-centers, veterinary Dispensaries and Veterinary Hospitals.
- Keep ready emergency Medicine Protocols.

### **Preparedness for the forthcoming monsoons**

The Department of Animal Husbandry & Veterinary Services has planned action in view of the preparedness for the forthcoming monsoon. The probable hazards that would occur during the monsoon are as follows:-

- (1) Flood
- (2) Cyclone
- (3) Landslides
- (4) Collapse of the cattle sheds
- (5) Electrocutation
- (6) Lightening Stroke

### **Precautionary measures to avoid flooding**

The dairy, poultry and piggery farmers are requested to open the trenches near the sheds so that there is no rain water stagnation and there is proper drainage of the rain water into the public drainage system.

The public is requested to contact the local Area Officers in case any disaster or the State Nodal Officer, Head Office, Panaji

### **Core Committee**

- 1) Dr. V. L. Bhaje, Assistant Director(AH), Directorate of Animal Husbandry & Veterinary Services, Patto, Panaji Goa. --- State Nodal Officer
- 2) Dr. Ernest D'Costa, Assistant Director, Directorate of Animal Husbandry & Veterinary Services, Patto, Panaji ----- to advise on medical requirements etc
- 3) Dr. U. V. T. Pednekar, Assistant Director, Disease Investigation Office, Tonca, Caranzalem --- purchase and supply of medicines, vaccines, for quick arrangement of postmortems and providing of kits if required.

Sub Committees are formed at Taluka Level under the direction of Local Area Officer

## **(d) DEPARTMENT OF AGRICULTURE**

Agriculture is prone to vagaries of nature and production and success of this sector is very often determined by climatic and other natural factors. Some of the commonly encountered disaster and calamities in agriculture in Goa are as below:-

1. Floods and inundation of water
2. Drought
3. Fire
4. Cyclonic winds
5. Mining run off
6. Pests & Diseases.

The Directorate of Agriculture has established strategy to reduce the intensity or to prevent the calamity through multi-pronged approaches.

**1. Floods and inundation of water in field:** The flooding of Fields occurs due to incessant rains and accumulation of water due to smaller passage for drainage lines. Though the rainfall cannot be controlled the draining lines, sluice gates are promoted for proper maintenance through the tenants associations specially in khazan fields. The weak bunds along the river are already notified for maintenance by the soil conservation division and the works are executed with the help of tenants associations by providing subsidy on the job to extent of 50% of cost. The weaker bunds are also promoted for modification to withstand tidal effect by providing upto 90% subsidy. In case of disaster the protective bunds are taken up for restoration at full cost by the Department and the share of the farmers is allowed for recovery in installments. The calamity is monitored by Executive Engineer, Soil Conservation Division of Directorate of Agriculture.

The Department also promotes the use of cemented floors for the threshing yard or drying yard for paddy. The farmers are advised to use the tarpaulin to cover the crop against protection from unexpected rainfall.

- 2. Drought**:- Goa being a coastal State the absolute droughts are rare. However, dry spell for a short or long term are common. Prolonged dry spell turn out to be disaster for the agriculture. The farmers are promoted for use of portable diesel pumpset or electrical ones to pump up available water from pond to area under the crop to provide protective irrigation.

The fields under the command area are catered by the Command Area Development Authority by release of water on emergency basis.

- 3. Fire**: Fire generally affects the cashew gardens or sugarcane farms. In case of cashew gardens farmers are trained for taking up precautionary measures by strip cleaning along the periphery of the plantations. The farmers are provided with weed cutting machine to cut the undergrowth in cashew plantations to reduce fire hazards. The cashew growers are also advised to extend the irrigation pipe line wherever possible to the cashew gardens for utilizing the water in case of fire in emergencies. The overhead sprinklers are included in the programme for development of sugarcane. This will help in dousing the fire in case of hazards. Similarly strip ploughing along the periphery of the crop is advocated among the growers.

- 4. Cyclone**: As regards cyclone the damage could be reduced in case of banana by immediately cutting the pseudo stem, whenever the plants break to allow the new shoot in case of younger plantations. Propping the bunches is advocated in the fruiting gardens.

- 5. Mining hazards**: The Goa Mineral Foundation is requested and is already working in construction of barriers for reducing the run of water and silt in the fields from the dumping site of the mining rejects.

**6. Pests and diseases:** Whenever any pests or diseases strike in endemic form, the pesticides shall be made available to the farmers for its control. The Department already provides the assistance for spray pumps at subsidized rate to equip the farmers to fight such menace.

Administrative arrangements and issues at the talukas level will be handled by Zonal Agricultural Officers. The following officers have been nominated as Nodal Officer for emergencies due to natural calamities in agriculture.

In case of damages during calamities, valuation and losses will be assessed by the respective taluka level Zonal Agricultural Officer through the Asst. Agricultural Officers attached to him.

## **(e) POLICE DEPARTMENT**

### **A) OBJECTIVES OF THE PLAN**

The primary objectives of the Disaster Management Plan are:-

1. To take prompt action to save valuable lives and property.
2. To provide rescue and relief work.
3. To instill confidence to tackle any crisis situation that may arise in future.
4. To handle situation efficiently in any emergency.
5. To bring the incident under control within shortest possible time.
6. To ensure normalcy within shortest possible time.
7. To coordinate the actions of the personnel and to evolve policies for cooperation among the various participating organizations.

### **B) ORGANIZATION AND CONTROL**

The North Goa District Police Headquarters is situated at Porvorim-Goa. There are 05 offices of Sub-Divisional Police Officers located at Panaji, Mapusa, Porvorim, Bicholim and Ponda and 12 Police Stations. The present strength of North Goa District Police is **01** Supdt. of Police, **05** Dy.Suptd. of Police, **11** Police Inspectors, **33** Police Sub-Inspectors, **29** Asstt. Sub-Inspectors, **144** Head Constables, **27** Lady Head Constables, **700** Police Constables and **21** Lady Police Constables.

The above vehicles and maximum staff will be utilized for rescue and relief operation in case of any disaster in North Goa District. The concerned SDPO & Incharges of Police Stations will be the Supervisory officers in their respective jurisdiction.

Besides, there is a Police Control Room for North Goa District at Porvorim, which will monitor the functioning of Police in North Goa District in case of any disaster, natural calamity.

## **ACTION PLAN**

### **(READINESS FOR ENSUING MONSOONS)**

Shri N.C. Raikar, Dy.Suptd. of Police HQ(North), Porvorim & SDPO Mapusa-II has been nominated as Nodal Officer for North Goa District. His contact numbers are as under. 2412723 (Office), 9423057533 (Mobile).

At every Police Station “Search and rescue team” has been formed consisting of 03 HCs & 15 PCs headed by 01 Police Sub-Inspector and these teams have been suitably instructed to move at short notice with equipments in effected area.

In case of flooding/land slide due to heavy rain/continuous rain in any part of North Goa District, maximum staff of this District will be diverted for rescue **operation** and if need, people from the area will be evacuated and taken to safe places.

Incharges of Police Stations have been directed to hold meetings with Panchayat/Municipal authorities under whose jurisdiction the following areas falls where there is possibility of flooding and land sliding in case of heavy and continuous rain.

Sr. No.	Police Station jurisdiction	Flooding area	Land sliding area
1	Panaji PS	Panaji City, Near Bal Bhavan Campal, Nevginagar, Mala, Bhatulem, Taleigao area	Altinho to St.Inez slope

2	Old Goa PS	1) Carambolim Dando	Sao Pedro, Old Goa
3	Mapusa PS	1) Guirim road side area	Gawasawada, Mapusa
4	Anjuna PS	-	Near Paradiso, Anjuna
5	Pernem PS	-	Vaidongar, Pernem
6	Bicholim PS	1) Shantadurga junction Bordem to Gaonkarwada 2) Bicholim market 3) Nanoda 4) Sanquelim market, Maulingtod to Gauthan 5) Kudnem near Paular bridge 6) Viridi, 7) Amona area, Tarwada 8) Khajan, Bhamai Pale area	-
7	Porvorim PS	-	Betim near Gurudwara area. Malim hill up to Secretariat.
7	Valpoi PS	1) Honda 2) Pissurlem 3) Kerim	-
8	Ponda PS	1) Mardol Veling Bridge 2) Mhalwada, Madkai 3) Madkai ferry point 4) Khandepar Bridge, Tankwado Usgao Gaonkarwada, Tiral, Near MRF factory. 5) Ganjem	1) Mangueshi village 2) Karanzalem Parampai. 3) NH-4A at Priol on road.

		6) Durbhat area ferry point 7) Kavle Bridge 8) Tivrem area 9) Curti Bridge area, Opa, Nirankal 10) Shahapur near Military camp. 11) Old Bus stand area Ponda.	
9	Collem PS	1) Udalshem -Sancorda  2) Barkattem –Mollem	1) Anmod Ghat

## **INTRODUCTION**

The total forest and tree cover together in Goa constitutes about 62% of the total geographic area of the State (forest cover is 33.06% of total geographical area). As such the total forest and tree cover of Goa is much higher than the goals set by the National Forest Policy 1988 1/3<sup>rd</sup> of the land area. This has been made possible due to the conservation ethos of the people of Goa, which has been supported by the most egalitarian and enlightened policy pursued by the State Government throughout. Of the total forest area, about 62% has been brought under the Protected Areas of Wildlife Sanctuaries and National Parks. Though the total forest and tree cover is much higher than the targets, constant efforts are being made to further improve the tree cover in the State.

To manage the vast natural resources existing in the State, the forest areas are being maintained by two Territorial Forest Divisions and one Wildlife & Eco-tourism Division, each division headed by Deputy Conservator of Forests. These three forest divisions are custodians of the forest areas in their respective jurisdiction. The mandate of Forest Department includes conservation, protection, enrichment and management of flora and fauna of the forests existing in the State as well as to promote eco-tourism in the potential area. Apart from managing the forest area, territorial divisions also regulate the felling and transportation of trees standing in non-forest areas.

In the normal course of functioning any unforeseen event may prove to be disastrous and demand extra effort be brought back to normalcy. Such unforeseen incident could be fatal to the human beings as well as to the rich biological resources like flora and fauna. Therefore comprehensive disaster management plan should be in hand to combat such eventuality that may arise, for the safety and well being of both human kind and the natural resources. The possible disasters that could adversely affect include

- Forest Fires
- Trees posing danger to life
- Wild animal menace
- Cyclones, heavy rains and flash floods

- Land slides, Earthquake (Tsunami)
- Unforeseen encounter with wild animals causing injury to forest staff in the field

## **PREVENTION, MITIGATION AND PREPAREDNESS PLAN**

Disaster is not a common phenomenon and may occur without any warning or anticipation. Therefore keeping in view the possible disaster situation that could happen and affect the forests and wildlife, some preventive and mitigation measures are being taken up by the department. The preventive mitigation and preparedness activities adopted by the department under different situation are briefly illustrated below.

### **FOREST FIRES**

Forest fires are not a common phenomenon in the state of Goa as the climatic conditions are moderate with minimum and maximum temperatures ranging between 20° c to 35° C normally. The predominant type of forests existing in Goa includes scrub forests, dry deciduous forest, moist deciduous forests, Semi –evergreen and evergreen forests. Due to presence of dry leaf litter on the forest floor during summer season and anthropogenic activities, forest areas may catch fire and cause damage to the flora and fauna. Such incidences are restricted to a few dry locations only. The forest department regularly monitors the field situation and takes up following preventive measures on regular basis.

- Prior to the onset of fire season i.e March to May in each year, the existing fire lines are cleaned by way of burning all the dry matter, dry leaf litter, dry grasses etc to avoid spread of fire in the event of forest fire.

- New fire lines are being created in fire prone areas with the funds made available to the Department from the State and Central Governments.
- Fire watchers are engaged to monitor the incidence of forest fires throughout the fire season every year.
- The department also procures fire fighting equipment to combat any forest fire incidence.
- Awareness is created among the local public regarding the forest fires and its adverse effects.
- Watch tower are constructed at strategic locations for better monitoring of fire incidences.
- Local villagers and village protection committee members are engaged in the fire fighting operations.

### **TREES POSING DANGER TO LIFE AND PROPERTY.**

Goa is bestowed with extensive green cover and the people are also very conservative towards tree growth. Trees provide all good things to human beings and some times due to their location and condition may pose danger to the human life as well as to the property. Such incidences are commonly reported during high winds, heavy rains, thunder storms, cyclones etc in general. The Forest Department is working hand in hand with the District Administration to mitigate this recurring problem. Generally such incidences are reported in private areas and on the road side to a greater extent . Preventive measures adopted to mitigate the problem include.

- Trees that pose danger are to be pruned/felled to avoid any possible damage to human life and property for which the Tree Officers are giving permissions on priority to the Public and other Government Organizations.
- The forest department is equipping itself with tree felling and logging equipment and skilled man power to remove any dangerously standing tree in the forest areas. Help of Emergency services (like fire Brigade, PWD) are taken:

### **WILD ANIMAL MENACE:**

Wild animals are generally seen in the forest areas and they move comfortably with out minding the boundaries. Some times due to various reasons like shortage of food, fodder, water etc and competition among themselves, the wild animals do enter into the human habitation or the agricultural fields. The incidence of wild animals entering into the human habitation has increased in recent times, thereby causing, damage and danger to life and property. The wild animals which venture commonly into the habitation and crops in Goa include monkeys, wild boars, crocodiles, birds, variety of snakes and some times panther and elephant. Apart from the incidence of wild animals entering into habitation, there are incidences where in the wild animals are found with injuries and are under distress. The possible disaster situations associated with the wild animals is manifold and the forest department is always preparing and updating itself to handle this task and adopts various preventive and mitigation measures as detailed here under.

- The department conducts regular patrolling to monitor and spot any activity of the wild animals in the vicinity of human habitation.
- Awareness is being created among the local people about the possible encounters and danger associated with the animals and the precautions to be taken in the event of such encounter.
- Animal rescue centers are being maintained at various locations like Campal & Bondla manned by skilled staff who can handle the wild animals with care. These rescue centers are open round the clock and throughout the year.
- Local people and Non Government Organizations are involved in various occasions for patrolling, capture and driving away of wild animals. The department is working along with the local people to combat the possible problem.
- Inter State Coordination to regulate/prevent movement of wild animals into human habitation.
- Portable animal enclosures are available with department to keep the rescued animals temporarily and the veterinary doctor is also available to treat the rescued and animals under distress.

In the event of panthers entering into the habitations the forest department lays traps to capture the animal and also tranquilizes the animal if required and translocates the animals to safe place.

- Crop raids by wild elephants is a recent phenomenon in Goa. The wild elephants from the adjoining forests of Karnataka enter into fringe villages in Goa and cause damage to the crop. The department made extensive

arrangements to drive these animals away from the agricultural fields and human habitation by establishing patrolling camps and by involving local people in elephant driving operations.

**(g) FISHERIES DEPARTMENT**

**A) FOREWARD:**

I. Disaster is an unexpected, unfacing, sudden and unfortunate event which can take place at any moment without any intimation or imagination. As such it can harm any person, animal, property and can have unexpected damage to life and property. As far as Fisheries Department is concerned it is concerned with the rivers, sea and oceans where the fishing vessels ply for catching fish as their livelihood on which their families depends. In their fishing venture they will have to face many calamities such as unexpected cyclone, heavy rain, flood, accident with other floating vessel like barge, ship rock, Tsunami drowning /sinking.

There is also possibility of sudden health problems of crew members, unexpectedly while in the highsea, engine failure, danger of catching fire by the vessel etc.

**B) Preventive Measure to be Initiated.**

I. The Department receives timely weather warning By Fax from Metrological Department which the Department immediately convey to the fishing societies situated in the following places:

1. Mandovi Fishermen Marketing Co-op.Society Ltd.Malim Jetty, Betim-Bardez.

2. Xapora Fishing Boat Owners Fisheries Co-operative

Ltd., Chapora - Bardez,Goa.

The Departmental fishery Surveyor posted in V.P. Offices and Fisheries Officers posted at Taluka Level on B.D.O. office are directed to convey and alert the fishermen coming under their jurisdiction to take precaution while venturing for fishing in the river and sea.

II. If the Department receives any complaint/Information from any fishing boat/canoe owner regarding missing of their fishing vessel or facing any danger in the water the Department immediately contact the Coastal Security Police and also Coast Guard for assisting in tracing the missing fishing vessel. Phone No. are written as follows:

1. Coast Guards No. - 2520585, 2521051, 2520440

2. Coastal Security Police. - 2272233, 9823219111 (P.I

Coastal Police)

### **C) Rehabilitation**

1. The Department is already having in its possession one fishing boat and a patrolling boat fully equipped with crew members which can be utilized for rescue operation wherever possible.

2. In case a temporary re-habilitation of the disaster victims the Department can accommodate them on the Departmental Fisheries Training Centre situated at Ela-Dhauji, Old Goa temporarily till alternate arrangement is made by the general administration by the victims themselves.

## **(h) FIRE AND EMERGENCY SERVICES:**

Refer Appendix XV.

## APPENDIX-III

### READY RECKONER

#### Instructions to be followed in the event of Floods:

Do's	Don'ts
Regular listening to the Radio /TV / Public Addressing System for advance information and advice.	Do not enter into flood waters without any support
Disconnect all electrical appliances and move all valuable personal and household belonging and clothing out of reach of floodwater.	Never wander around a flooded area.
Move vehicles, essentials commodities, farm animals etc to the high elevated place nearby as far as practicable.	Do not allow children to play in, or near, flood waters.
Turn off the gas/stoves etc or may shift it with you have to leave the house.	Do not drive into water or areas of unknown depth and current.
Lock all outside doors and windows before leaving for safer place.	Do not eat food or drink water, which is contaminated by floodwater.
If you have to evacuate, do not return until you are advised to do so.	

**Instructions to be followed in the event of Cyclones:**

Do's	Don'ts
Regular listening to the Radio /TV / Public Addressing System for advance information and advice.	Avoid peeping / go outside during a lull in the storm.
Allow considerable margin for safety.	Do not go near fallen power lines, damaged bridges and structures.
A cyclone may change direction, speed or intensity within no time, so stay turned to the Radio / TV for updated information.	Do not go outside out of curiosity or for sightseeing.
Tape up large windows to prevent from shattering and cut out free flow of wind.	Do not relax if there is a lull as it could be the eye of the storm and winds could pick-up again.
Move to the nearest shelter or vacate the area if this is ordered by the appropriate Government Agency.	
Stay indoors and take shelter in the stronger part of the house.	

Open windows on the sheltered side of the house if the roof begins to lift.	
Find shelter if you are caught out in the open.	
If you have to evacuate, do not return until you are advised to do so.	
Try to fasten up all loose objects like cans, tins, other equipments etc as they become deadly projectiles during a storm.	
Maintain your composure and try to calm others.	
Free the livestock.	

**Instructions to be followed in the event of Earthquakes:**

Do's	Don'ts
Listen to the Radio /TV / Public Address System for advance information and advice.	Do not run amok and do not wander round the streets.
Teach all members of your family how to turn	Do not stand close to buildings, walls, slopes, electricity wires and cables & stay in the

off the electricity, water and gas supply.	vehicle.
Protect yourself by staying under the lintel of an inner door, in the corner of a room, under a table or even under a bed.	Do not rush to the doors or exits, never use the lifts keep well away from windows, mirrors, chimneys and furniture.
Keep away from old, dilapidated and tall buildings, electricity wires, slopes and walls, which are liable to collapsed.	Do not go near loose/fallen electricity wires and do not touch any metal object in contact with them.
Stop the vehicle away from building, walls slopes, electricity wires and cables and stay inside the vehicle.	Do not re-enter badly damaged buildings and do not go near damage structures.
Immediately leave your badly damaged house.	
Collect water containers, food items (preferably dry foods), personal medicines etc.	

## **LANDSLIDE READY RECKONER**

### **Areas That Are Generally Prone To Landslides**

- On existing landslides, old or recent
- On or at the base or top of slopes

- In or at the base of minor drainage hollows
- At the base or top of an old fill slope
- At the base or top of a steep cut slope

### **Areas That Are Generally Safe From Landslides**

8. On hard, non-jointed bedrock that has not moved in the past
9. On relatively flat-lying areas away from slopes and steep river banks.
10. At the top or along the nose of ridges, set back from the tops of slopes

### **Recognize the landslide warning signs**

- Doors or windows stick or jam for the first time.
- New cracks appear in plaster, tile, brick, or foundations.
- Outside walls, walks, or stairs begin pulling away from the building.
- Slowly developing, widening cracks appear on the ground or on paved areas such as streets or driveways.
- Underground utility lines break
- Bulging ground appears at the base of a slope
- Water breaks through the ground surface in new locations
- Sudden decrease in creek water levels though rain is still falling or just recently stopped.
- Fences, retaining walls, utility poles, or trees tilt or move.
- You hear a faint rumbling sound that increases in volume as the landslide nears. The ground slopes downward in one specific direction and may begin shifting in that direction under your feet.

### **What To Do If You Suspect Immediate Landslide Danger**

23. Contact your local fire, police or public works department

24. Inform affected neighbors
25. Leave the area quickly

## **Things To Do If You Live Near Steep Hills**

### **Before Intense Storms**

- 4) Become familiar with the land around you. Learn whether landslides or debris flows have occurred in your area by contacting local officials, state geological surveys or departments of natural resources, GSI, and university departments of geology. Slopes where landslides or debris flows have occurred in the past are likely to experience them in the future.
- 5) Support your local government in efforts to develop and enforce land-use and building ordinances that regulate construction in areas susceptible to landslides and debris flows. Buildings should be located away from known landslides, debris flows, steep slopes, streams and rivers, intermittent-stream channels, and the mouths of mountain channels.
- 6) Watch the patterns of storm-water drainage on slopes near your home, and note especially the places where runoff water converges, increasing flow over soil-covered slopes. Watch the hillsides around your home for any signs of land movement, such as small landslides or debris flows or progressively tilting trees.
- 7) Contact your local authorities to learn about the emergency response and evacuation plans for your area, and develop your own emergency plans for your family and business.

### **During Intense Storms**

- g. Stay alert and stay awake! Many landslides and debris flow fatalities occur when people are sleeping. Listen to a radio for warnings of intense rainfall. Be aware that intense short bursts of rain may be particularly dangerous, especially after longer periods of heavy rainfall and damp weather.
- h. Listen for any unusual sounds that might indicate moving debris, such as trees cracking or boulders knocking together. A trickle of flowing or falling mud or debris may precede larger landslides. If you are near a stream or channel, be alert for any sudden increase or decrease in water flow. Such changes may indicate landslides activity upstream, so be prepared to move quickly. Don't delay! Save yourself, not your belongings.
- i. If you are in areas susceptible to landslides and debris flow, consider leaving if it is safe to do so. If you remain at home, move to a part of the

house farthest away from the source of landslide or debris flows, such as an upper flow, but keep an escape route open should it become necessary to leave the house.

- j. Be especially alert when driving. Embankments along roadsides are particularly susceptible to landslides. Watch the road for collapsed pavement, mud, fallen rocks, and other indications of possible landslides or debris flows.

### **After Intense Storms**

- ✓ Keep looking for signs that the land is moving. Landslides can occur weeks or months after intense storms.

### **Things to Remember**

- ✓ Mudflows tend to flow in channels, but will often spread out over a floodplain. They generally occur in places where they have occurred before.
- ✓ Landslides and mudflows usually strike without warning. The force of rocks, soil, or other debris moving down a slope can devastate anything in its path. Take the following steps to be ready.

### **If you live in landslide prone area**

5. Get a ground assessment of your property.
6. Your county geologist or county planning department may have specific information on areas vulnerable to landsliding. Consult a professional geotechnical expert for opinions and advice on landslide problems and on corrective measures you can take

### **You can minimize home hazards**

5. Plant ground cover on slopes and build retaining walls.
6. In mudflow areas, build channels or deflection walls to direct the flow around buildings.
7. Remember: If you build walls to divert debris flow and the flow lands on a neighbor's property, you may be liable for damages.

### **During Landslides**

**If inside a building:**

6. Stay inside.
7. Take cover under a desk, table, or other piece of sturdy furniture.

**If outdoors:**

- 2- Try and get out of the path of the landslide or mudflow.
- 3- Run to the nearest high ground in a direction away from the path.
- 4- If rocks and other debris are approaching, run for the nearest shelter such as a group of trees or a building.
- 5- If escape is not possible, curl into a tight ball and protect your head.

**After Landslide**

- 4) Stay away from the slide area. There may be danger of additional slides.
- 5) Check for injured and trapped persons near the slide area. Give first aid if trained.
- 6) Remember to help your neighbors who may require special assistance – infants, elderly people, and people with disabilities.
- 7) Listen to a battery-operated radio or television for the latest emergency information.
- 8) Remember that flooding may occur after a mudflow or a landslide.
- 9) Check for damaged utility lines. Report any damage to the utility company.
- 10) Check the building foundation, chimney, and surrounding land for damage.
- 11) Replant damaged ground as soon as possible since erosion caused by loss of ground cover can lead to flash flooding.
- 12) Seek the advice of geotechnical expert for evaluating landslide hazards or designing corrective techniques to reduce landslide risk.
- 13) Report the incidence to the nearest State Government Agency or Geological Survey of India.

## APPENDIX - IV

### DETAILS OF DISTRICT

Sr. No.	Name of District	Name of Sub-Division	Name of Taluka	Municipal councils	Name of Block	No. of G.P.	No. of Villages
1	North Goa District	Panaji	<b>Tiswadi</b>	Corporation of City of Panaji	Tiswadi	19	40
2							
3		<del>Mapusa</del>	Bardez	Mapusa	Bardez	33	46
4		Pernem	Pernem	Pernem	Pernem	20	27
5		Bicholim	i -Bicholim	i -Bicholim	i -Bicholim	17	31
				ii-Sattari	ii -Valpoi	ii -Sattari	12
	Ponda	Ponda	Ponda	Ponda	19	32	
<b>TOTAL</b>	<b>01</b>	<b>05</b>	<b>06</b>	<b>07</b>	<b>06</b>	<b>120</b>	<b>258</b>

### Distance of Sub-Div / Taluka Headquarters from District Headquarters.

Sr. No.	Name of Sub-Div./ Taluka	Headquarters	Distance from Panaji in Kms.	Public / Pvt. Bus Service	Other mode of transport
	<b>Sub – Divisions</b>				

1	Panaji	Panaji	0	•	---
2	Mapusa	Mapusa	16	•	---
3	Pernem	Pernem	34	26.	---
4	Bicholim	Bicholim	34	8)	---
5	Ponda	Ponda	32	k.	---
	<b>Taluka</b>				
1	Tiswadi	Panaji	0	✓	---
2	Bardez	Mapusa	16	✓	---
3	Pernem	Pernem	34	7.	---
4	Bicholim	Bicholim	34	8.	---
5	Sattari	Valpoi	61	8.	---
6	Ponda	Ponda	32	6-	---

**APPENDIX - V**

**LIST OF OFFICERS**

**( TO BE CONTACTED IN CASE OF EMERGENCIES )**

<b>Sr. No.</b>	<b>Officers to be contacted</b>	<b>Contact Numbers</b>	
		<b>Office</b>	<b>Residence</b>
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
<b>I. 1) COLLECTORATE HEADQUARTERS - (NORTH)</b>			
1	Shri R. Mihir Vardhan, Collector & District Magistrate.	2223612 Fax.2426492	9822123071
2	Shri Shiv Kumar, IAS, Additional Collector-I & ADM.	2223418	
3	Shri Dipak Desai, Additional Collector-II	2225383 Fax.2426148	9422059555
4	Shri A. J. D'Souza, Deputy collector(LA)	2225083	9850926003
5	Shri M.V. Corjuenkar, Deputy Collector(Rev)	2225083 2225383	9822151587 2410148
6	Shri Sheru Shirodkar, Deputy Collector(DRO)	2225083	9822159405
7	Shri Rajesh Azgaonkar, Mamlatdar-in-Collectorate.	2225383	9921389999
8	EPBX.	2225083 2225383 2426758 1077	-----
	CONTROL ROOM / FAX	2422059	

<i>Sr.</i>	<i>Officers to be contacted</i>		<i>Contact Numbers</i>	
<b>2) DEPUTY COLLECTOR / S.D.O.s</b>				
1	Shri Sanjeev Desai	Panaji.	2225511	9822383488
2	Shri S.P. Shetye	Mapusa	2262038 2741742	9011097838
3	Shri Meena Goltekar	Pernem.	2201223 2201142	9370567428
4	Shri N.M. Gad	Bicholim.	Fax.2362058 2360254	9822177680
5	Shri Johnson Fernandes	Ponda.	2312469 2312470	9423323127
<b>3) MAMLATDARs</b>				
1	Shri Sudhir Kerkar	Tiswadi.	2425533	9423139899
2	Shri Pundalik Khorjuenkar	Bardez	2262233 2262210	9420595095
3	Shri. Chandrakant Shetkar	Bicholim.	2362237	9922356241
4	Shri Satish Desai	Pernem.	2201223 2201411	9823212416
5	Shri Paresh Phalidesai	Sattari	2374243 2374090	9423307942
6	Shri Amul Gaonkar	Ponda	2312121 2312136	
<b>II. 1) POLICE</b>				
20	Shri Vijay Singh, IPS	S.P.(North), Porvorim.	2416100	7875756005
21	Shri Vishram Borkar	S.P.(Traffic), Panaji	2426580	7875756010
22		Dy.S.P.(Traffic), Panaji.	2428970 (Ext.331)	7875756069
<b>2) S.D.P.O.'s</b>				
23	Shri Umesh Gaonkar	S.D.P.O., Panaji.	2226519	7875756021
24	Shri Serafin Dias	S.D.P.O., Mapusa – I.	2262207	7875756025
25	Shri P.I. Mapari	S.D.P.O., Mapusa–II	2412723	7875756029

<b>Sr.</b>	<b>Officers to be contacted</b>		<b>Contact Numbers</b>	
26	Shri Gajanan P. Dessai	S.D.P.O., Bicholim.	2363737	7875756032
27	Shri Dinraj Govekar	S.D.P.O., Ponda.	2317978	7875756035
<b>3) POLICE STATIONS</b>				
28	Shri Rajendra Prabhudesai	Panaji	2428482	7875756022
29	Shri Manoj Mardolkar	Old Goa	2285301	7875756024
30	Shri Shivram Vaigankar	Agassiam	2218000	7875756023
31	Shri Sagar Ekoskar	Ponda	2313101	7875756036
32	Shri Ramesh Gaonkar	Valpoi	2374255	7875756034
33	Shri Tushar Vernekar	Mapusa	2262231	7875756026
34	Shri Nolasco Raposo	Calangute	2278284	7875756031
35	Shri Rahul Parab	Porvorim	2417704	7875756030
36	Shri Vishwas Karpe	Anjuna	2662253	7875756027
37	Shri Tushar Lotlikar	Pernem	2201233 2201065	7875756028
38	Shri Neenad Devulkar	Bicholim	2362233	7875756033
<b>III. 1) FIRE &amp; EMERGENCY SERVICES</b>				
39	Shri Ashok Menon , Director Kamat Classic Bldg.No.4, Caranzalem.	Fire & Emergency Services, Panaji.	2227616 2225500 2425101 2423101 2232902 /101	9763717044

<b>2) FIRE STATIONS</b>				
40	Station Officer	Panaji	2225500 2425101	2225500 (Ext. 246)

41	Station Officer	Mapusa	2262900 2263354	2287145
42	Station Officer	Pernem	2201201 2201393	2201486
43	Station Officer	Valpoi	2374444	5632161
44	Station Officer	Bicholim	2362100	2369340
45	Fire Control Room	-----	101	

#### IV. 1) MUNICIPAL ADMINISTRATION

46	Shri Sandeep Jacques, Director, r/o Panaji.	Directorate of Municipal Administration, Panaji.	2427708	
47	Ms. Biju Naik , Asstt. Director		2427708	
48	<b>Shri Sanjit Rodrigues, Commissioner,</b>	Corporation of City of Panaji.	2223339 2224550	
49	<b>Shri , Chief Officer,</b>	Municipal Council, Mapusa	2262463 2250016	
50	<b>Shri S. B. Shetkar, Chief Officer</b>	Municipal Council, Pernem	2201259 2201808	
51	<b>Shri Ramesh L. Velingkar, Chief Officer</b>	Municipal Council, Bicholim	2262282 2361408	
52	<b>Shri P.T. Nipanikar, Chief Officer r/o. Assonora, Tivim.</b>	Municipal Council, Valpoi	2374222	
53	<b>Shri Shrinet Khotwale, Chief Officer, r/o. Mapusa.</b>	Municipal Council, Ponda.	2315006	

#### 2) PANCHAYATs

54	Shri Narayan R. Sawant, Director,	Directorate of Panchayats, Panaji.	2432826 2222586	9423313662
55	Shri Jayant Tari, Dy. Dir.,	- do -	2222586	9822135285
56	Shri Vishant S.N. Gaunekar,	B.D.O. Tiswadi	2426481	94230567041
57	Shri Tushar Halarnkar	B.D.O. Bardez	2262206	9822382303
58	Shri Tushar Halarnkar,	B.D.O. Pernem	2201231	9822382303
59	Shri Shashank Thakur	B.D.O. Bicholim	2362103	9922448214

60	Shri Shashank Thakur	B.D.O. Sattari	2374250	2363682 9922448214
61	Ms. Mohini K. Halarnkar,	B.D.O. Ponda	2312019	9850118128

<b>V. OTHER DEPARTMENTS</b>				
62	Shri <b>K. V. Singh</b> , Meteorologist Incharge,	Goa Observatory, Panaji.	2425547	2226307
63	Shri <b>N. V. Verlekar</b> , Director	Directorate of Fisheries, Panaji.	2224660 2224838	9823619947
64		Captain of Ports, Panaji.	2225070 2426109	2462948 9890331573
65	Shri <b>S. S. P. Tendulkar</b> , Director	Directorate of Agriculture, Panaji.	2436851	9423061340
66	Shri <b>Nirmal Braganza</b> , Chief Engineer.	Electricity Department, Panaji.	2224680 2426986	2451071 9822126667 9422444111
67	Shri <b>J. S.S. Rego</b> , Principal Chief Engineer.	Public Works Department, Panaji.	2224984 2422901	9822487293
68	Shri <b>S. D. Nadkarni</b> , Chief Engineer	Water Resources Department, Panaji.	2223506	2432493 9422437432
69	Dr. <b>Shashi Kumar</b> , Chief Conservator	Forests Department, Panaji.	2224747 2225926	9422439953
70	Dr. <b>Dalvi</b> , Director.	Directorate of Health Services, Panaji.	2225561 2225646 2225668 2225540	
71	Smt. <b>Shabri Mandrekar</b> ,	Directorate of Civil	2227798	

	Director	Supplies & Price Control, Panaji.		
72	Mrs. Celsa Pinto, Director	Directorate of Education, Panaji	2221521 2221516 2221508	9822487659
73	Shri Arun Desai , Director	Directorate of Transport, Panaji.	2225724	
<b>VI. PUBLIC UTILITY SERVICES</b>				
1	Goa Medical College ( Casualty ).		2423026	-----
2	Goa Medical College (Bambolim).		2458700	-----
3	Asilo Hospital, Mapusa.		2265119 2262372	-----
4	Police Control Room		2426482 100	-----
5	Electricity		135	-----
6	Water Supply		137	-----
7	Fire Bridgade		101	-----
<b>VII. AMBULANCE</b>				
8	GATES		102	
9	Esperance Clinic, Panaji.		2463185	-----
10	Indian Red Cross, Panaji.		2224601	-----
11	Care Foundation, Miramar.		2423488 2423489	-----
<b>VIII. ELECTRICITY COMPLAINTS</b>				
12	Panaji.		2225835	-----
13	Ponda.		2312190	-----
14	Mapusa.		2262218	-----
15	Bicholim		2361447	-----
16	Pernem		2291549	-----
17	Valpoi		2374244 2374464	-----

**NAME AND ADDRESS OF THE OFFICERS FROM GEOLOGICAL SURVEY OF INDIA TO BE CONTACTED FOR INFORMATION ON LANDSLIDE**

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<b>STATE</b>	<b>CONTACT PERSON</b>
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	Tel: 020-26696489 FAX:020-26696489 e-mail: <a href="mailto:gsipune@pn3.vsnl.net.in">gsipune@pn3.vsnl.net.in</a>
TAMIL NADU & KERALA	G. Rajagopalan, Director Geological Survey of India, CGO Complex, A-2-B Wing, Rajaji Bhawan, Besant Nagar Chennai-90 Tel: 044-24465529 (O), 24454523 ® FAX: 044-24912782 e-mail: <a href="mailto:gsi-chennai@vsnl.com">gsi-chennai@vsnl.com</a>

**APPENDIX- VI**  
**NODAL OFFICERS**

Sr. No	Name & Designation of Nodal officers		Department to which represents	Contact numbers	
				Office	Residence
1	2		3	4	5
<b>DISTRICT LEVEL</b>					
	<b>Shri A.J. D'Souza, Dy. Collector (LA)</b>		<b>Collectorate (North)</b>	<b>2225383 2227690</b>	<b>9850926003</b>
	<b>Shri Orlando Rodrigues, Dy. Director (Farms)</b>		<b>Directorate of Agriculture</b>	<b>2425910 2436851 2226445</b>	<b>2734871 9226777344</b>
	<b>Shri Anant D. Chodankar, A.D.A (A.E) MCO, Tonca</b>			<b>2462467</b>	<b>9850453371</b>
	<b>Shri Sriram Dhaimodkar Z.A.O</b>	<b>Tiswadi</b>		<b>2285329</b>	<b>9423320560</b>
	<b>Sanjeev Mayenkar , Z.A.O</b>	<b>Mapusa</b>		<b>2262368</b>	<b>9422545263</b>
	<b>Anil A. De Noronha, ZAO</b>	<b>Pernem</b>		<b>2201291</b>	<b>9422442212</b>
	<b>Pradeep Malik,</b>	<b>Bicholim</b>		<b>2362128</b>	<b>9423057740</b>

	<b>ZAO</b>				
	<b>Nitin Bakhale,</b> <b>ZAO</b>	<b>Ponda</b>		<b>2312119</b>	<b>9881217767</b>
	<b>Anant Hoble,</b> <b>ZAO</b>	<b>Sattari</b>		<b>2374246</b>	<b>9422057245</b>
	<b>Shri Ashok Menon,</b> <b>Director (Offg).</b>		<b>Directorate of Fire &amp; Emergency Services,  Panaji</b>	<b>2226100</b>	<b>9763717044</b>
	<b>Fire Control Room Panaji</b>			<b>2227616</b> <b>2225500</b> <b>2425101</b>	
	<b>Shri Ajit K. Kamat,</b> <b>Station Fire Officer</b>		<b>Fire Force Heaquarters, Panaji</b>	<b>2225500</b> <b>2425101</b>	<b>9763717053</b>
	<b>Shri Mervyn B. A. Ferrao,</b> <b>Station Fire Officer</b>		<b>Panaji Fire Station</b>	<b>2225500</b>	<b>9763717054</b>
	<b>Shri Prakash M. Parab,</b> <b>Asst. Divisional Officer</b>		<b>Central Fire Station,  Ponda</b>	<b>2312044</b>	<b>9763717046</b>
	<b>Shri Shailesh Gawade</b> <b>Station Fire Officer</b>		<b>Ponda Fire Station</b>	<b>2312044</b>	<b>8308846749</b>
	<b>Shri Namdev Dhargalkar</b> <b>Station Fire Officer</b>		<b>Old Goa Fire Station</b>	<b>2312044</b>	<b>8308846744</b>

	<b>Shri Dattaram D. Redkar</b> <b>Station Fire Officer</b>	<b>Mapusa Fire Station</b>	<b>2262900</b> <b>2263354</b>	<b>9763717049</b>	
	<b>Shri T. B. Dessai,</b> <b>Station Fire Officer</b>	<b>Pernem Fire Station</b>	<b>2201201</b> <b>2201393</b>	<b>9763717050</b>	
	<b>Shri S.G. Gawas</b> <b>Station Fire Officer (CC)</b>	<b>Bicholim Fire Station</b>	<b>2362100</b>	<b>9763717047</b>	
	<b>Shri Laximan V. Majik,</b> <b>Sub Officer</b>	<b>Valpoi Fire Station</b>	<b>2374444</b>	<b>9763717062</b>	
<b>Sr. No</b>	<b>Name &amp; Designation of Nodal officers</b>	<b>Department to which represents</b>	<b>Contact numbers</b>		
			Office	Residence	
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	
	<b>Dr. Mangala Tamba</b> <b>Health Officer, Urban Health Centre, Panaji</b>	<b>TISWADI TALUKA</b>	DIRECTORATE OF HEALTH SERVICES, PANAJI	2426495	
	<b>Dr. Kedar Raikar</b> <b>Health Officer, P.H.C, Corlim</b>			2285769	9011025020
	Dr. Medical Supdt. Cum-Dy. Director, Asilo Hospital, Mapusa	<b>BARDEZ TALUKA</b>		2265119 2262372	

Dr. Medical Officer i/c, P.H.C, Colvale			2299870	
Dr. Health Officer, Urban Health Centre, Mapusa			2262226	
Dr. Health Officer, PHC, Candolim			2489035	
Dr. Health Officer, PHC, Siolim			2272250	
Dr. Health Officer, PHC, Aldona			2293251	
Dr. Health Officer, Community Health Centre, Pernem	<b>PERNEM TALUKA</b>		2201249	
Dr. Health Officer, PHC, Cansavanem			2205222	
Dr. Health Officer, PHC, Bicholim	<b>BICHOLI M TALUKA</b>		2362050	
Dr. Health Officer, PHC,			2362041	
			2364258	

	Sanquelim				
	Dr. Health Officer, Community Health Centre Valpoi	<b>SATTARI TALUKA</b>		2374260	
	Dr. Health Officer, Community Health Centre, Ponda	<b>PONDA TALUKA</b>		2312115 2312114	
	Dr. Health officer, PHC, Marcaim			2362230	
	Dr. Health Officer, PHC, Betki			2287160	
	Dr. PHC, Shiroda			2306243 2307072	
<b>Sr. No</b>	<b>Name &amp; Designation of Nodal officers</b>	<b>Department to which represents</b>	<b>Contact numbers</b>		
			Office	Residence	
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	
	<b>Dr. V.L. Bhaje, Asst. Director (AH)</b>	<b>Department of Animal Husbandry &amp; Veterinary Services, Patto, Panaji</b>	<b>2437245</b>	<b>9765328153</b>	

Dr. Asst. Director, DIU, Tonca, Caranzalem	Taluka Nodal Officer, Tiswadi	2462919	
Dr. Veterinary Officer, Vety. Hosp. Mapusa	Taluka Nodal Officer, Bardez	2257237	
Dr. Veterinary Officer, Vety. Disp. Pernem	Taluka Nodal Officer, Pernem	2201832	
Dr. Veterinary Officer, Vety. Disp. Bicholim	Taluka Nodal Officer, Bicholim	2362090	
Dr. Veterinary Officer, Vety. Disp. Valpoi	Taluka Nodal Officer, Sattari	2374682	
Dr. Asst. Director, Vety. Hosp. Ponda	Taluka Nodal Officer, Ponda	2313027	
<b>Shri Arvind S. Salelkar, Superintendin Engineer, Circle-I, WRD, Panaji</b>	<b>Water Resources Department, Junta House (Annexe), Panaji</b>	<b>2226042</b>	<b>9420690075 9890697808</b>
<b>Shri S.S. Tirodkar Ex. Engineer-I, PWD, Patto Panaji</b>	<b>O/o. Principal Chief Engineer, PWD, Altinho, Panaji</b>	<b>2226222</b>	<b>9370221400</b>
<b>Shri R.M. Pandit Ex. Engineer-I, PWD, Patto Panaji</b>		<b>2226223</b>	<b>9370278154</b>
<b>Shri P.B. Sheldarkar</b>		<b>2225516</b>	<b>9370278022</b>

<b>Ex. Engineer-II, PWD, Patto Panaji</b>				
Shri Ex. Engineer-XIII, PWD, Mapusa			2252129	
<b>Shri Arolkar</b> <b>Ex. Engineer-XXIII(Roads), PWD, Bicholim</b>			<b>2362360</b>	<b>9370260615</b>
<b>Shri V. S. Mardolkar,</b> <b>Ex. Engineer-XVI, PWD, Ponda q</b>			<b>2312032</b>	<b>9370278188</b>
<b>Shri P.B. Sheldarkar</b> <b>Ex. Engineer-XVIII, PWD, Ponda</b>			<b>2313003</b>	<b>9370278022</b>
<b>Shri S. T. Bhangul</b> <b>Superintending Engineer (North), 2<sup>nd</sup> Floor, Vidyut Bhawan, Panaji</b>		O/o. Chief Electrical Engineer, Electricity Department, Vidyut Bhavan, 3 <sup>rd</sup> Floor, Panaji – Goa	<b>2424194</b>	<b>9561122000</b>
Panaji Control Room				9422444018
Shri Asst. Engineer	Tiswadi Taluka			
Shri Elect. Dept. Ansabhat, Mapusa	Bardez Taluka			

Shri Elect. Dept.. Ansabhat, Mapusa				
Shri. Asst. Engineer, Pernem, Addl. Nodal Officer	Pernem Taluka			
Shri Elect. Deptt. Bicholim	Bicholim Taluka			
Shri Elect. Dept. Curti, Ponda	Ponda Taluka			
<b>Shri Surendra Gaonkar</b> <b>Mun.Engineer</b>		<b>Corporation of the City of Panaji</b>	<b>2224550</b> <b>2223339</b>	<b>9403687465</b>
Shri Jr. Engineer		Mapusa Municipal Council, bardez		
Shri M. I				
Shri Chief Officer		Municipal Council Pernem	2201259 2201808	
Shri Chief Officer		Municipal Council Bicholim	2262282 2361408	
Shri		Municipal Council	2374222	

	Chief Officer	Valpoi		
	Shri Chief Officer	Municipal Council Ponda	2315006	
	Shri Inspector	Inspectorate of Factories & Boilers, Panaji	2227670 2226181 2226510-F	

## APPENDIX - VII

### STORAGE FACILITY IN THE DISTRICT

Sr. No.	Name of Taluka	Location of Godown	No. of Government Godowns available	Type of storage structure	Remarks
1	<b>Tiswadi</b>	Panaji	01	RCC	All the Godowns belong to Directorate of Civil Supplies.
2	<b>Bardez</b>	Mapusa	01	RCC	
3	Pernem	Pernem	01	RCC	
4	Bicholim	Sanquelim	01	RCC	
5	Sattari	Honda	01	RCC	
6	<b>Ponda</b>	Ponda	01	RCC	



## APPENDIX – VIII

### CYCLONE / FLOOD SHELTERS

#### TISWADI TALUKA

Sr.No.	Name of Village where school is located	Sr.No.	Name of Village where school is located
1	2	1	2
1.CALAPUR	1.GPS, Deulwado	10. CUMBHARJUA	1.Govt. Primary School, Cumbharjua Gawant Wado
	2.GPS Bandh		2.Govt. Primary School, Khadap Wado, Cumbharjua
2.SE OLD GOA	1.Old Goa Educational Institute High School		3.Govt. Sharda Vidhalaya High School
	2.Govt. Primary School, St. Pedro, Old Goa	11.GOLTIM NAVELIM	1.Govt. Primary School, Piedade, Divar
	3.Govt. Primary School Ella, Old Goa.		2.Govt. Primary School, Navelim
	4.Govt. Primary School, Mollar		12.TALEIGAO
3. AGACAIM	1. Govt. Primary School, Sulabhat	2. Our Lady of	

	2.Govt. Primary School, Near V.P. Office		Rosary High School
	3. St. Lourenco High School, Agassaim		3.GPS, Nagali
			4.GPS, Galli
			5.GPS Dondrem
4.SAO MATHIAS	1.GPS , Sao Matias		6.GPS Camrabhat
5.CURCA BAMBOLIM TALAULIM	1. GPS Curca, Curca		7.GPS Odlembhat
	2.GPS , Gawali Moula	13.MERCES	1.Govt. Primary School, Merces
6.CARAMBOLIM	1. Govt. primary School, Carambolim	14.CORLIM	1. Vidhyaniketan High School(P.D.A.)
7.AZOSSIM MANDUR	1.Govt. Primary School, Azossim		2. Govt. Primary School, Dhulapi, Corlim
	2. Govt. Primary School, Mandur		3. Govt. Primary School, Mangado, Corlim
8.SIRIDAO	1.Govt. Primary School, Palem	15.CHIMBEL	1. GPS Manaswada, Chimbel
9. ST.ESTEVAM	1.Govt. Primary School, Akhada		2. Govt. Middle School, Kirlawada
	2.Govt. Primary School, St. Inez Tonca		3.GPS Kirlawada, Chimbel
16.CHORAO	1. Dayanand High School Bautana, Chodan, Ilhas	19.NEURA	1. Dayanand Arya High School, Neura
	2.St. Bartholomeu High School, Devgem, Chodan		2.Azmane High School, Neura
	3.GPS, Karem Chorao		3.GPS, Neura O Grande
	4. GPS, Saudo, Chorao		4.GPS Neura O Pequeno
	5. GPS, Pursabhat, Chorao		
	6. GPS, Deugi, Chorao		
	7. GPS, Madel Chorao	20.PANAJI	1.Don Bosco High School, Panaji
17.BATIM	1.GPS Gaonkarwada Batim		2.People's High School, Panaji
	2.GPS Marina Batim		
18.GOA VELHA	1.Primary Imaculate High School		3.Mustifund High School, Panaji

	2.St. Andrew High School		
	3.Poplar High School		4.Progress High School
	4.Govt. Primary School, Forgottem		5.Kasturba High School
	5.Montesary School		
	6.Govt. Primary School, Dando		

### BARDEZ TALUKA

Location of the Shelter	Description of the shelter	Location of the Shelter	Description of the shelter
1	2	1	2
1-MAPUSA	1. G.P.S. Cunchelim, Datta Mandir 2. G.P.S. Xelpem, Duler Mhapsa.	3-REIS-MAGOS	G.P.S. Sonarbhat Reis Magos.
2-SANGOLDA	Government Primary School Sangolda.	4-NERUL	Comunidade Building Nerul,.
8-VERLA – CANCA	1)Government Primary Schools Verla. 2)Government Primary Schools Canca	5-CAMURLIM	1)G.P.S. Vagali Camurlim 2)Comunidade Bulding, Camurlim 3)G.P.S. Gaokar Wado Camurlim
9-MOIRA	1)G.P.S. Kaliyan Moira. 2)G.P.S. Bambordem,	6-SIOLIM-SODIEM	Holy Cross Convent School.

10-PENHA-DE-FRANCA	G.P.S. Alto Betim, Penha De France		7-SIOLIM – MARNA	1)St. Anthony Community Centre Hall, 2)St. Francis Xavier Hall
11-BASTORA	Village Panchayat Hall, Bastora		13-CANDOLIM 1	1)G.P.S. Pintos Wado 2)G.P.S. Dando Wado
1 2-SOCORRO	1)G.P.S. Joshwada. 2)G.P.S. Carrem. 3)G.P.S. Aradem. 4)G.P.S. Aradem		14 - CALANGUTE	1)G.P.S.
			15-TIVIM	G.P.S. Cansa Tivim,

**PERNEM TALUKA**

Sr. No.	Name of Village		Sr. No.	Name of Village	
1.	Bandek	Govt.	8.	Chandel	- do -

	ar-wada, Morjim	Primary School (vacant)	9.	Alorna	Govt. Primary Middle School
2.	Agarwada	Sateri Sabha-grah			
3.	Dhargalim	Govt. primary School, Gaonwada (vacant)	10.	Khutwal, Alorna	- do -
			11.	Talarna	- do -
4.	Cansarvarnem	Govt. Primary Middle School	12.	Nagzar	Govt. Primary School
5.	Bodgul, Cansarvarnem	Govt. Primary Middle School	13.	Tulaskarwadi	Govt. Primary Middle School

6.	Chande 1	H.B.G. Memorial Govt. High School	14.	Warkhand	Govt. Primary School
7.	Hali, Chande 1	Govt. Primary Middle School	15.	Shemyade adwan, Warkhand	- do -

**BICHOLIM TALUKA**

1.	Advalpal	1) Shri Sarvani Temple Mandap  2) Shri Vetat Temple Mandap	16	Maulinguem North	1) High School Building
2.	Amona	1) Shri Amruteshwar Temple Mandap  2) Govt. High School	17	Maulinguem South	1) Multipurpose Building  2) Bhumika Prasad Hall

		Building 3) Amona Panchayat Hall	18	Mencurem	1) Shri Mauli Temple Mandap Dharmashala
3.	Aturli	1) Shri Brahmanand Swami Math	19	Mulgao	1) Shri Kelbai Temple Mandap 2) Shri Ravalnath Temple Mandap 3) Shri Vandevata Temple Nadap
4.	Bicholim	1) Higer Sec. Building 2) Shantadurga Higher School Building 3) Our lady of Grace High School Building 4) Govt. Schedule Caste Hostel Building 5) Shantadurga Temple Hall	20	Narao	1) Govt. Pry & Secondary School Bul
			21	Navelim	1) Govt High School
5.	Bordem	1) Mahamaya Temple Hall	22	Ona	1) Shri Kalika Temple Hall,
6.	Carapur	1) Private High School Building	23	Pale	1) Tarabai High School Building 2) Shri Navdurga High School Building
7.	Cotombi	1) Shri Chandreshwar Sabha Mandap			
8.	Cudnem	1) Shri Kudneshwar			

		Temple Mandap 2) Mahalaxmi High School Building	24	Piligao	1) Shri Shantadurga Temple Mandap 2) Ideal High School Building
9.	Curchirem	1) Govt. Primary School Building 2) Govt. High School Building	25	Sanquelim	1) Samaj Mandir Hall 2) Radhakrishna Theatre 3) Private High School Building 4) Govt./ Higher Secondary School Building
10.	Dumacem	1) Shri Sateri Temple Mandap			
11.	Harvalem	1) Govt. Primary School Building 2) Shantilal Company Colony			
12.	Lamgao	1) Hirabai Zantye Hall			
13.	Latambarcem	1) Shri Kalika Devi Mandap			
14.	Maem	1) High School Building 2) Govt. Poly Building	26	Sirigao	1) Shri Lairai Temple Mandap
15	Sarvan	1) Lokmanya High School Building 2) Shyampurush Temple Mandap	27	Surla	1) Shri Siddheshwar Temple Mandap 2) Tagore High School Building

28	Vaiguinim	1) Shri Khetoba Temple Mandap	30	Viridi	1) Shri Mahadev Temple Mandap
29	Velguem	1) Shrimati High school & Higher Secondary			2) Govt Primary School Building

**SATTARI TALUKA**

<b>Location of the Shelter</b>	<b>Description of the Shelter</b>	<b>Location of the Shelter</b>	<b>Description of the Shelter</b>
1 - Querim	GHS QUERIM	7 - Ovaliem	GHS PISSURLEM
2 -Morlem	GPS MORLEM	8 - Advoi	GPS ADVOI
3 -Poriem	GPS PORIEM/ GPS TULSIMALA	9 - Codiem	GPS CODIEM
4 -Onda	GPS ONDA PANCHAYAT OFFICE	10- Vaghurem	GPS CODIEM
5 - Pissurlem	GHS PISSURLEM	11- Vantem	GPS VANTEM
6 - Sonus	GPS ONDA	12- Valpoi	GHSS VALPOI

**PONDA TALUKA**

Location of the Shelter	Description of the Shelter	Location of the Shelter	Description of the Shelter
<b>1- BANDORA</b>		<b>4 - CONXEM</b>	
1	G.P.S. Kurpas	1	G.P.S. Conxem
2	G.P.S. Navath	<b>5 - CODAR</b>	
3	G.P.S.Ramnathi	1	G.P.S. Codar
4	G.P.S.Tolulem	<b>6 - BETQUI- CANDOLA</b>	
5	G.P.S. Karwade	1	G.P.S. Haldanwada
6	<b><u>G.P.S. Gaunem No. 1</u></b>	2	G.P.S. Gaonkarwada
7	G.P.S.Warad Gaunem	3	G.P.S. Ameywada Candola
8	G.P.S. Gaunem No. 2	4	G.P.S. Wadi Betqui
9	G.P.S. Chirputem	5.	<b>G.P.S. Betqui</b>
10	G.P.S. Farmagudi	6	<b>G.P.S. Tale Betqui</b>

<b>2 - BETHORA</b>		<b>7 - BHOMA</b>	
1	G.H.S. Bazarmol	1	G.P.S. Bhom

2	G.P.S. Talyewada		2	G.P.S. Muslimwada
3	G.P.S. Padal		3	Mahanandu Memoraial School, Nagzarwada
4	G.P.S. Bondbag			
5	G.P.S. Mestawada			
6	G.P.S. Gothawada		<b>8 - BORIM</b>	
<b>3 - NIRANCAL</b>			1	G.P.S. Borim Centre
1	G.P.S. Bibolwada		2	G.P.S. Khazordem
2	G.P.S. Galwada		3	G.P.S. Tishem
3	G.P.S. Shignewal		4	G.P.S. Tamshirem
4	G.P.S. Kumbarwada		5	G.P.S. Paniwada
5	G.P.S. Mattidad			
<b>9 - CUNDAIM</b>			6	G.P.S. Deulwada
1	New English School		7	G.P.S. Talsai
2	G.P.S. Bazar		<b>14 - PANCHAWADI</b>	
3	G.P.S. New Building		1	G.P.S. Mudai
4	G.P.S. Dharjowada		2	G.P.S. Ambegal
5	G.P.S. Wadiwada		3	G.P.S. Vizar
6	G.P.S. Mauzowada		4	G.P.S. Jitone Matt
<b>10 - CURTI- CANDEPAR</b>			5	G.P.S. Vizar Matt
1	G.P.S. Bazar Khandepar		6	G.P.S. Mapa
2	G.P.S. Gauthan Khandepar		7	G.P.S. Digas
3	G.P.S. Opa Khandepar		<b>15 - PONDA</b>	

4	G.P.S. Murdi		1	<u>G.P.S. Ponda Centre</u>
5	G.P.S. Keryawada		2	G.P.S. Khadpabandh
6	G.P.S. Zeermole		3	G.P.S. Varkande
<b>11 - DURBHAT</b>			4	G.P.S. Juna Bazar
1	Sharada Eng. H.S.		5	G.P.S. Ponda Tisk
2	G.P.S. Agapur No. 1		6	Almeida High School
3	G.P.S. Agapur No. 2	<b>16 - QUEULA</b>		
4	G.P.S Und Agapur		1	G.P.S. Kapileshwari
5	G.P.S. Adapoi		2	G.P.S. Khalchawada Dhavali
6	G.P.S. Durbhat			
<b>12 - SAVOI VEREM</b>			3	G.P.S. Varchawada
1	Krishna Raghunath Shetye Savoikar H.S. Dupe Savoi		4	G.P.S.Kavale
			5	G.P.S. Galshirem
2	G.H.S. Dupe Savoi		6	Lokmanya Tilak H.S.
3	G.P.S. Pali Savoi		7	<u>S.S. Samiti H.S.</u>
4	G.P.S. Savoi Verem	<b>17 - MARCAIM</b>		
			1	G.P.S. Adanwada
			2	G.P.S. Aksan wada

<b>13 - QUERIM</b>			3	G.P.S. Marcaim center Dutalem
1	G.P.S. Arla			
2	G.P.S. Amarkhane		4	G.P.S. Dutalem
3	G.P.S. Satode		5	G.P.S. Honso
4	G.P.S. Karmale		6	G.P.S. Karanzal
			7	G.P.S. Mahalwada
			8	G.P.S. Parampoi

## **APPENDIX - IX**

### **List of PHCs / UHCs Under DHS with Bed strength & Manpower.**

Sl. No.	Name of the Hospital	R/U	Type of Hospital	Management	of System Medicine	BEDS				
						Male	Female	Children	Common	Total
1	2	3	4	5	6	7	8	9	10	11
	<b><u>CHC Pernem</u></b>									
1	Community Health Centre, Pernem	R	Gen	State Govt.	Allop.	11	11	18	-	40
2	Hirabai Parsekar Memorial Hospital, Mandrem	R	Gen	Pvt.	Allop.	-	10	-	-	10
	<b><u>CHC Ponda</u></b>									
1	Community Health Centre, Ponda	R	Gen.	State Govt.	Allop.	6	20	-	46	72
2	Dr. Singbals Hospital, Ponda	U	Gen.	Pvt.	Allop.	-	-	-	20	20
3	Jankibai Memorial Hospital, Ponda	U	Gen.	Pvt.	Allop.	--	-	-	10	10
4	Dr. Usgaonker's Children Hospital, Ponda	U	Spec.	Pvt.	Allop.	-	-	22	-	22
5	Kamat Maternity Home, Ponda	U	Spec.	Pvt.	Allop.	-	18	-	-	18
6	Dr. Kakodkar's Hospital, Sadar, Ponda	U	Gen.	Pvt.	Allop.	-	-	-	9	9
7	Dr. Dev's Children Hospital, Ponda	U	Spec.	Pvt.	Allop.	-	-	8	-	8

8	Dr. Sirsat Hospital, Tiska, Ponda	U	Gen.	Pvt.	Allop.	-	-	-	11	11
9	Savoikar Nursing Home, Ponda	U	Gen.	Pvt.	Allop.	-	-	-	23	23
10	Dr. R. Usgaonker Hospital, Ponda	U	Gen.	Pvt.	Allop.	-	-	-	7	7
11	Dr. Priolkar, Hospital, Ponda	U	Gen.	Pvt.	Allop.	-	-	-	7	7
12	Navjivan Nursing Home, Ponda	U	Spec.	Pvt.	Allop.	-	15	-	-	15
13	Dr. Juwarkars Hosp. Ponda	U	Spec.	Pvt.	Allop.	-	-	8	-	8
<b><u>CHC Valpoi</u></b>										
1	Community Health Centre, Valpoi	R	Gen	State Govt.	Allop.	10	15	-	5	30
2	Amshekar Nursing Home, Valpoi	U	Gen	Pvt.	Allop.	-	2	-	1	3
<b><u>PHC Aldona</u></b>										
1	Primary Health Centre, Aldona	R	Gen.	State Govt.	Allop.	5	9	-	-	14
2	Dr. Antonio Pinto do Rosario Hospital, Socorro Porvorim	R	Gen.	Pvt.	Allop.	-	14	-	-	14
3	Dr. Bhales Orthopaedic Hospital, Porvorim	R	Spec.	Pvt.	Allop.	4	4	-	-	8
4	Manoshri Childrens Hospital, Alto Porvorim	R	Spec.	Pvt.	Allop.	-	-	14	-	14
5	JMJ Nursing Home, Socorro, Porvorim	R	Gen.	Pvt.	Allop.	-	21	-	4	25
<b><u>PHC Betki</u></b>										

1	Primary Health Centre, Betki	R	Gen.	State Govt.	Allop.	3	9	-	-	12
2	Anandi Nursing Home & Maternity Hospital, Marcela	R	Gen.	Pvt.	Allop.	3	5	-	6	14
3	Rural Health Centre, Mandur.	R	Gen	State Govt.	Allop	10	10	-	-	20
<b><u>PHC Bicholim</u></b>										
1	Primary Health Centre, Bicholim	R	Gen.	State Govt.	Allop.	7	23	-	-	30
2	Our Lady of Grace Hospital, Bicholim	U	Gen.	Pvt.	Allop.	3	10	-	-	13
3	Mahatme Hospital, Bicholim	U	Gen.	Pvt.	Allop.	4	10	-	-	14
4	Mardolkar Hospital, Bicholim	U	Gen.	Pvt.	Allop.	5	5	-	-	10
5	Cairo Nursing Home, Bicholim	U	Gen	Pvt.	Allop.	7	10	-	-	17
6	Adhar hospital Sarvan	U	Gen	Pvt.	Allop	4	4	4	9	21

<b><u>PHC Candolim</u></b>										
1	Primary Health Centre, Candolim	R	Gen.	State Govt.	Allop.	4	8	-	-	12
2	Bosio Hospital, Candolim	R	Gen.	Pvt.	Allop.	5	6	-	12	23
3	Mandovi Clinic Porvorim	R	Gen.	Pvt.	Allop.	-	-	-	44	44
4	Chodankar Nursing Home, Porvorim	R	Gen.	Pvt.	Allop.	-	-	-	40	40

5	Dharwadkar Nursing Home, Calangute	R	Gen.	Pvt.	Allop.	-	-	-	14	14
6	Dr. Tito's Hospital, Calangute.	R	Gen	Pvt.	Allop	-	-	-	14	14
<b>PHC Cansarvornem</b>										
1	Primary Health Centre, Cansarvornem	R	Gen	State Govt.	Allop.	-	-	-	12	12
<b>PHC Colvale</b>										
1	Dumaskar Nursing Home, Tivim	R	Gen.	Pvt.	Allop.	-	-	-	16	16
<b>PHC Corlim</b>										
1	Goa Medical College Bambolim@	U	Teaching	State Govt.	Allop.	300	38	105	22	10
2	Institute of Psychiatry & Human Behaviour, Bambolim	U	Teaching	State Govt.	Allop.	96	84	-	10	19
3	Dr. Dhakankar Hospital, Pilar	R	Gen.	Pvt.	Allop.	5	5	-	-	10
4	Netravalkar Nursing Home, Caranzalem	U	Gen.	Pvt.	Allop.	3	3	-	1	7
5	Naguendra Bal Shushrushalaya, Taleigao	U	Spec.	Pvt.	Allop.	-	-	20	-	20
6	Manipal Goa Cancer & General Hospital, Dona Paula.	U	Gen.	Pvt.	Allop.	6	6	2	26	40
7	Shriram Clinic Taleigao	U	Gen.	Pvt.	Allop.	6	3	-	-	9
8	Raikar Nursing Home, Carambolim	R	Gen.	Pvt.	Allop.	-	-	-	5	5

9	Kenkre Health Centre & Hospital, Bambolim.	U	Spec.	Pvt.	Allop.	-	15	-	-	15
	<b>PHC Marcaim</b>									
1	Primary Health Centre, Marcaim	R	Gen	State Govt.	Allop.	4	8	-	-	12
2	Prtiolkar Surgical, Maternity & Children Hospital, Mangueshi	R	Gen.	Pvt.	Allop.	-	-	-	9	9
	<b>PHC Sanquelim</b>									
1	Primary Health Centre, Sanquelim	R	Gen.	State Govt.	Allop.	14	16	-	-	30
2	Verlekar Nursing Home, Sanquelim	R	Spec.	Pvt.	Allop.	-	5	-	-	5
	<b>PHC Shiroda</b>									
1	Primary Health Centre, Shiroda	R	Gen.	State Govt.	Allop.	3	9	-	-	12
2	Shri Kamaxi Nursing Home, Shiroda	R	Gen.	Pvt.	Allop.	8	-	-	-	8
3	Shri Kamaxidevi Homeopathic Medical College & Hospital, Shiroda	R	Teac hing	Vol.	Homeo.	8	17	-	-	25
4	Kamaxi Arogya Dham Shiroda	R	Teac hing	Pvt.	Ayur.	50	50	-	-	100

<b>PHC Siolim</b>										
1	Primary Health Centre, Siolim	R	Gen.	State	Allop.	6	6	-	-	12
				Govt.						
2	St. Anthony's Nursing Home, Anjuna	R	Gen.	Pvt.	Allop.	20	20	-	-	40
<b>UHC Mapusa</b>										
1	Asilo Hospital, Mapusa	U	Gen.	State	Allop.	64	72	30	24	190
				Govt.						
2	Bhagyoday Hospital, Dattawadi, Mapusa	U	Gen.	Pvt.	Allop.	6	6	-	7	19
3	Kalangutkar Nursing Home, Angod Mapusa	U	Spec.	Pvt.	Allop.	-	-	-	15	15
4	Mapusa Clinic & Research Centre, Mapusa	U	Gen.	Pvt.	Allop.	6	6	8	34	54
5	Dharmanand Hospital, Khorlim Mapusa	R	Spec.	Pvt.	Allop.	-	6	-	3	9
6	Vrundavan Hospital & Research Centre, Peddem Mapusa	U	Gen.	Pvt.	Allop.	6	6	2	26	40
7	Dr. Olavo Rebeiro Hospital, Fairalta, Mapusa.	U	Gen.	Pvt.	Allop.	-	-	-	20	20
8	Janata Maternity Hospital, Dhuler	U	Spec.	Pvt.	Allop.	-	10	-	-	10

9	Sankalp Hospital, Fairalta, Mapusa.	U	Gen.	Pvt.	Allop.	3	4	-	8	15
10	Tendulkar Hospital, (Kenkre's Nursing Home), Dattawadi, Mapusa.	U	Gen.	Pvt.	Allop.	-	-	-	12	12
11	Holy Cross Hospital, Mapusa.	U	Gen.	Pvt.	Allop.	8	20	-	19	47
12	Gauns Child Care Hospital, Mapusa	U	Spec.	Pvt.	Allop.	-	-	6	8	14
13	Pereira Medicare Research Centre, Khorlim Mapusa	R	Spec.	Pvt.	Allop.	-	-	-	4	4
<b>UHC Panaji</b>										
1	Military Hospital, Panaji	U	Gen.	Central Govt.	Allop.	73	23 *	-	-	96
2	Kamat Maternity & Surgical Hospital, Miramar	U	Gen.	Pvt.	Allop.	-	-	-	12	12
3	Dr. Rajyadhyaksha General Hospital, Panaji	U	Gen.	Pvt.	Allop.	-	-	-	22	22
4	Dr. Talaulikar Nursing Home, St.Cruz	R	Spec.	Pvt.	Allop.	-	26	-	-	26
5	Dr. Bhandare Hospital, Panaji	U	Gen.	Pvt.	Allop.	10	10	-	-	20
6	Dr. Kedar's Maternity & Infertility Hospital, Panaji	U	Spec.	Pvt.	Allop.	-	8	-	2	10
7	Smt. Laximibai Talaulikar	U	Gen.	Pvt.	Allop.	-	-	-	20	20

	Memorial Hospital, Panaji									
8	"Esperance" Estibei-ro Hospital, Miramar	U	Gen.	Pvt.	Allop.	-	-	-	10	10
9	Raikar Nursing Home, Tonca	U	Spec.	Pvt.	Allop.	-	16	-	-	16
10	Ghanekar Nursing Home, Panaji	U	Gen.	Pvt.	Allop.	-	-	-	5	5
11	Sardessai Nursing Home, Panaji	U	Gen.	Pvt.	Allop.	4	6	-	5	15
12	Ghanashyam Govind Kamat Hospital, Mala, Panaji	U	Spec.	Pvt.	Allop.	-	17	-	-	17
13	Dr. Vaidya Hospital, Panaji	U	Gen.	Pvt.	Allop.	5	5	-	7	17
14	Cosme Matias Menezes Memorial Clinic, Panaji.	U	Gen.	Vol.	Allop.	-	-	-	24	24
15	Vintage Hospital, St.Inez	U	Gen.	Pvt.	Allop.	-	-	-	40	40
16	Om Urological Centre	U	Spec.	Pvt.	Allop.	-	-	-	10	10

@ Goa Medical College, Bambolim, covers the beds of G.M.C. Bambolim (930 beds) and T.B. Hospital St. Inez (80) beds.

\* including children

Names of the units	No of beds	No of doctors			No of dentist	No of nurses	MPHW		Pharmacist	Technician		L.H.V.
		specialists	others	Total			Male	Female		X-ray tech.	Lab.tech.	

North Goa												
Hospitals												
Asilo hospital	190	22	20	42		73		2	5	8	8	1
CHC.Ponda	72	4	4	8	1	16	10	12	2	3	1	1
CHC.Pernem	40	3	5	8	1	10	9	12	1	1	1	1
CHC.Valpoi	30	4	5	9	1	9	9	15	2	1	1	1
PHC.Bicholim	30		5	5	1	9	4	10	1		1	1
PHC Aldona	14		4	4	1	5	10	12	1		1	1
PHC candolim	12		4	4	1	5	8	8	1		1	1
PHC Betki	12		4	4	1	5	9	10	1		1	1
PHC siolim	12		4	4		5	8	8	1		2	1
PHC Marcaim	12		4	4		7	3	3	1		1	
PHC Cansarvanem	12		4	4		5	7	7	1		1	1
PHC sanquelim	30		4	4		6	3	7	2		1	1
PHC Shiroda	12		4	4		6	4	4	1			1
PHC Colvale	0		1	1		2	4	4	1		1	1
PHC Corlim	0		1	1		2	8	8	1		1	1

UHC Panaji	0		3	3	1	3	5						
UHC Mapusa	0		2	2	1	3	2						

## APPENDIX – X

### List of Government / Private Hospitals with its status.

Sl. No.	Name of the Hospital	Telephone	R	Type	Management	System	BEDS				
							Male	Female	Children	Common	Total
1	2	3	4	5	6	7	8	9	10	11	12
	Community Health Centre, Pernem	201249	R	Gen	State Govt.	Allop.	11	11	18	-	40
1	Hirabai Parsekar Memorial Hospital, Mandrem	2247251	R	Gen	Pvt.	Allop.	-	10	-	-	10
2	Community Health Centre, Ponda	2312115	R	Gen.	State Govt.	Allop.	6	20	-	46	72
3	Dr. Singbals Hospital, Ponda	TBV	U	Gen	Pvt.	Allop.	-	-	-	20	20
4	Jankibai Memorial Hospital, Ponda	2312381	U	Gen	Pvt.	Allop.	--	-	-	10	10

5	Dr. Usgaonker's Children Hospital, Ponda	2312821	U	Spec.	Pvt.	Allop.	-	-	22	-	22
6	Kamat Maternity Home, Ponda	2312381	U	Spec.	Pvt.	Allop.	-	18	-	-	18
7	Dr. Kakodkar's Hospital, Sadar, Ponda	2312054	U	Gen.	Pvt.	Allop.	-	-	-	9	9
8	Dr. Dev's Children Hospital, Ponda	2316197	U	Spec.	Pvt.	Allop.	-	-	8	-	8
9	Dr. Sirsat Hospital, Tiska, Ponda	2312399	U	Gen.	Pvt.	Allop.	-	-	-	11	1 1
10	Savoikar Nursing Home, Ponda	2312633	U	Gen.	Pvt.	Allop.	-	-	-	23	2 3
11	Dr. R. Usgaonker Hospital, Ponda	TBV	U	Gen.	Pvt.	Allop.	-	-	-	7	7
12	Dr. Priolkar, Hospital, Ponda	TBV	U	Gen.	Pvt.	Allop.	-	-	-	7	7
13	Navjivan Nursing Home, Ponda	TBV	U	Spec.	Pvt.	Allop.	-	15	-	-	15

14	Dr. Juwarkars Hosp. Ponda	TBV	U	Spec.	Pvt.	Allop.	-	-	8	-	8
15	Community Health Centre, Valpoi	2374206	R	Gen	State Govt.	Allop.	1 0	15	-	5	30
16	Amshekar Nursing Home, Valpoi	2362040	U	Gen	Pvt.	Allop.	-	2	-	1	3
17	Primary Health Centre, Aldona	TBV	R	Gen.	State Govt.	Allop.	5	9	-	-	14
18	Dr. Antonio Pinto Do Rosario Hospital, Socorro, Porvorim	TBV	R	Gen.	Pvt.	Allop.	-	14	-	-	14
19	Dr. Bhales Orthopaedic Hospital, Porvorim	2417053	R	Spec.	Pvt.	Allop.	4	4	-	-	8
20	Manoshri Childrens Hospital, Alto Porvorim	TBV	R	Spec.	Pvt.	Allop.	-	-	14	-	14
21	JMJ Nursing Home, Socorro, Porvorim	2412130	R	Gen.	Pvt.	Allop.	-	21	-	4	25
22	Primary Health Centre, Betki	TBV	R	Gen.	State Govt.	Allop.	3	9	-	-	12

23	Anandi Nursing Home & Maternity Hospital, Marcela	TBV	R	Gen.	Pvt.	Allop.	3	5	-	6	14
24	Rural Health Centre, Mandur.	TBV	R	Gen	State Govt.	Allop	10	10	-	-	20
25	Primary Health Centre, Bicholim	2362050	R	Gen.	State Govt.	Allop.	7	23	-	-	30
26	Our Lady of Grace Hospital, Bicholim	2362040	U	Gen.	Pvt.	Allop.	3	10	-	-	13
27	Mahatme Hospital, Bicholim	2362659	U	Gen.	Pvt.	Allop.	4	10	-	-	14
28	Mardolkar Hospital, Bicholim	TBV	U	Gen.	Pvt.	Allop.	5	5	-	-	10
29	Cairo Nursing Home, Bicholim.	2362025	U	Gen	Pvt.	Allop.	7	10	-	-	17
30	Adhar hospital Sarvan	2361094/95	U	Gen	Pvt.	Allop	4	4	4	9	21
31	Primary Health Centre, Candolim	2489035	R	Gen.	State Govt.	Allop.	4	8	-	-	12
32	Bosio Hospital, Candolim	2489034	R	Gen.	Pvt.	Allop.	5	6	-	12	23

33	Mandovi Clinic Porvorim	TBV	R	Gen.	Pvt.	Allop.	-	-	-	44	44
34	Chodankar Nursing Home, Porvorim	TBV	R	Gen.	Pvt.	Allop.	-	-	-	40	40
35	Dharwadkar Nursing Home, Calangute	2276588	R	Gen.	Pvt.	Allop.	-	-	-	14	14
36	Dr. Tito's Hospital, Calangute.	2282169	R	Gen	Pvt.	Allop	-	-	-	14	14
37	Primary Health Centre, Cansarvornem	TBV	R	Gen	State Govt.	Allop.	-	-	-	12	12
38	Dumaskar Nursing Home, Tivim	2298592	R	Gen.	Pvt.	Allop.	-	-	-	16	16
39	Goa Medical College Bambolim@	2458701	U	Teac hing	State Govt.	Allop.	300	385	105	220	1010
40	Institute of Psychiatry & Human Behaviour, Bambolim	2458687	U	Teac hing	State Govt.	Allop.	96	84	-	10	190
41	Dr. Dhakankar Hospital, Pilar	2215548	R	Gen.	Pvt.	Allop.	5	5	-	-	10
42	Netravalkar Nursing Home, Caranzalem	TBV	U	Gen.	Pvt.	Allop.	3	3	-	1	7
43	Naguendra Bal Shushrushalaya,	TBV	U	Spec.	Pvt.	Allop.	-	-	20	-	20

	Taleigao										
44	Manipal Goa Cancer & General Hospital, Dona Paula.	2453301	U	Gen.	Pvt.	Allop.	6	6	2	26	40
45	Shriram Clinic Taleigao	TBV	U	Gen.	Pvt.	Allop.	6	3	-	-	9
46	Raikar Nursing Home, Carambolim	2284900	R	Gen.	Pvt.	Allop.	-	-	-	5	5
47	Kenkre Health Centre & Hospital, Bambolim.	2245313 /562878 3	U	Spec.	Pvt.	Allop.	-	15	-	-	15
48	Primary Health Centre, Marcaim	2392230	R	Gen	State Govt.	Allop.	4	8	-	-	12
49	Priolkar Surgical, Maternity & Children Hospital, Mangueshi	TBV	R	Gen.	Pvt.	Allop.	-	-	-	9	9
50	Central Hospital, Tiska, Dharbandora	TBV	R	Gen	Central Govt.	Allop.	-	-	-	60	60
51	Primary Health Centre, Sanquelim	2362050	R	Gen.	State Govt.	Allop.	14	16	-	-	30
52	Verlekar Nursing Home, Sanquelim	2364203	R	Spec.	Pvt.	Allop.	-	5	-	-	5
53	Primary Health Centre, Siolim	TBV	R	Gen.	State	Allop.	6	6	-	-	12

					Govt.						
54	St. Anthony's Nursing Home, Anjuna	2274208	R	Gen.	Pvt.	Allop.	20	20	-	-	40
55	Asilo Hospital, Mapusa	2262211	U	Gen.	State Govt.	Allop.	64	72	30	24	190
56	Bhagyoday Hospital, Dattawadi, Mapusa	2262816	U	Gen.	Pvt.	Allop.	6	6	-	7	19
57	Kalangukar Nursing Home, Angod Mapusa	2262852	U	Spec.	Pvt.	Allop.	-	-	-	15	15
58	Mapusa Clinic & Research Centre, Mapusa	TBV	U	Gen.	Pvt.	Allop.	6	6	8	34	54
59	Dharmanand Hospital, Khorlim Mapusa	TBV	R	Spec.	Pvt.	Allop.	-	6	-	3	9
60	Vrundavan Hospital & Research Centre, Peddem Mapusa	2250022 /33	U	Gen.	Pvt.	Allop.	6	6	2	26	40
61	Dr. Olavo Rebeiro Hospital, Fairalta, Mapusa.	2262383	U	Gen.	Pvt.	Allop.	-	-	-	20	20
62	Janata Maternity Hospital, Dhuler	TBV	U	Spec.	Pvt.	Allop.	-	10	-	-	10
63	Sankalp Hospital, Fairalta, Mapusa.	2266158	U	Gen.	Pvt.	Allop.	3	4	-	8	15

64	Tendulkar Hospital, (Kenkre's Nursing Home), Dattawadi, Mapusa.	2262106	U	Gen.	Pvt.	Allop.	-	-	-	12	12
65	Holy Cross Hospital, Mapusa.	TBV	U	Gen.	Pvt.	Allop.	8	20	-	19	47
66	Gauns Child Care Hospital, Mapusa	2250968	U	Spec.	Pvt.	Allop.	-	-	6	8	14
67	Pereira Medicare Research Centre, Khorlim Mapusa	TBV	R	Spec.	Pvt.	Allop.	-	-	-	4	4
68	Military Hospital, Panaji	TBV	U	Gen.	Central Govt.	Allop.	73	23 *	-	-	96
69	Kamat Maternity & Surgical Hospital, Miramar	2462864	U	Gen.	Pvt.	Allop.	-	-	-	12	12
70	Dr. Rajyadhyaksha General Hospital, Panaji	TBV	U	Gen.	Pvt.	Allop.	-	-	-	22	22
71	Dr. Talaulikar Nursing Home, St.Cruz	5640061	R	Spec.	Pvt.	Allop.	-	26	-	-	26
72	Dr. Bhandare Hospital, Panaji	2424966	U	Gen.	Pvt.	Allop.	10	10	-	-	20
73	Dr. Kedar's Maternity & Infertility Hospital,	2227127	U	Spec.	Pvt.	Allop.	-	8	-	2	10

	Panaji											
74	Smt. Laximibai Taulikar Memorial Hospital, Panaji	2425625	U	Gen.	Pvt.	Allop.	-	-	-	20	20	
75	"Esperance" Estibeiro Hospital, Miramar	2463890	U	Gen.	Pvt.	Allop.	-	-	-	10	10	
76	Raikar Nursing Home, Tonca	2284900	U	Spec.	Pvt.	Allop.	-	16	-	-	16	
77	Ghanekar Nursing Home, Panaji	TBV	U	Gen.	Pvt.	Allop.	-	-	-	5	5	
78	Sardessai Nursing Home, Panaji	TBV	U	Gen.	Pvt.	Allop.	4	6	-	5	15	
79	Ghanashyam Govind Kamat Hospital, Mala, Panaji	2435727	U	Spec.	Pvt.	Allop.	-	17	-	-	17	
80	Dr. Vaidya Hospital, Panaji	2422688	U	Gen.	Pvt.	Allop.	5	5	-	7	17	
81	Cosme Matias Menezes Memorial Clinic, Panaji.	2225918	U	Gen.	Vol.	Allop.	-	-	-	24	24	
82	Vintage Hospital, St.Inez	2544440	U	Gen.	Pvt.	Allop.	-	-	-	40	40	
83	Om Urological Centre	TBV	U	Spec.	Pvt.	Allop.	-	-	-	10	10	

@ Goa Medical College, Bambolim, covers the beds of G.M.C. Bambolim (930 beds)

and T.B. Hospital St. Inez (80) beds.

## APPENDIX - XI

### List of Veterinary Hospitals/Dispensaries with number of Veterinary Doctors, Veterinary Assistants and Bull Attendants/Attendant Dressers.

Name of the Vety. Hosp./Disp.	No. of Veterinary Doctors		No. of Veterinary Assistants	No.of Bull Attendants	No./ of Attendant Dresser
	A.D.	V.O.			
Vety.Hosp., Tonca	2	2	9	4	1
Vety.Hosp., Mapusa	-	2	5	4	1
Vety.Hosp., Ponda	1	1	9	6	3
Vety.Hosp., Honda	1	-	4	2	1
Vety.Hosp., Sonsodo	1	-	7	2	-

Vety.Disp., Quepem	-	1	5	-	1
Vety.Disp., Majorda	-	1	1	2	-
Vety.Disp., Cuncolim	-	1	2	4	-
Vety.Disp., Dharbandora	-	1	2	2	1
Vety.Disp., Bicholim	-	1	6	3	-
Vety.Disp., Siolim	-	1	2	1	-
Vety.Disp., Shiroda	-	1	3	1	-
Vety.Disp., Usgao	-	-	5	3	-
Vety.Disp., Gawane	-	1	2	1	-
Vety.Disp., Valpoi	-	1	6	1	-
Vety.Disp., Poinguinim	-	-	1	2	1
Vety.Disp., Canacona	-	1	4	3	1
Vety.Disp., Mollem	-	1	3	3	-
Vety.Disp., Netravali	-	-	2	-	1
Vety.Disp., Sanguem	-	1	6	4	-

Vety.Disp., Vasco	-	1	3	2	1
Vety.Disp., Navelim	-	1	1	-	1
Vety.Disp., Calangute	-	1	2	-	1
Vety.Disp., Pirna	-	1	2	1	-
Vety.Disp., Pernem	-	1	4	4	1
Vety.Disp., Mandrem	-	1	4	2	2

## **DETAILS OF VETERINARY HOSPITALS**

### **North Goa District**

1. Veterinary Hospital Tonca

- (i) KVSC Ela, Old Goa
- (ii) KVSC Chorao
- (iii) KVSC Goa Velha
- (iv) KVSC Cumbarjua

2. Veterinary Hospital Acoi-Mapusa

- (i) KVSC Aldona
- (ii) KVSC Salvador do mundo

3. Veterinary Hospital Honda

- (i) KVSC Morlem
- (ii) KVSC Paryem
- (iii) KVSC Ravona
- (iv) KVSC Keri

4. Veterinary Hospital Ponda

- (i) KVSC Kawalae
- (ii) KVSC Nirankal
- (iii) KVSC Priol
- (iv) KVSC Savoi-Verem
- (v) KVSC Madkai
- (vi) KVSC Kundai
- (vii) KVSC Betora
- (viii) KVSC Keri

5. Veterinary Dispensary Pernem

- (i) KVSC Chandel
- (ii) KVSC Warkhand

6. Veterinary Dispensary Mandrem

- (i) KVSC Agarwada

7. Veterinary Dispensary Bicholim

- (i) KVSC Kasarpal
- (ii) KVSC Navelim
- (iii) KVSC Sanquelim

8. Veterinary Dispensary Valpoi

- (i) KVSC Advai
- (ii) KVSC Thana
- (iii) KVSC Nagargao
- (iv) KVSC Surla(Sattari)

9. Veterinary Dispensary Gawane

- (i) KVSC Khotodem

10. Veterinary Dispensary Shiroda

- (i) KVSC Borim

11. Veterinary Dispensary Usgao

- (i) KVSC Gueli
- (ii) KVSC Surla (Bicholim)
- (iii) KVSC Kasilem (Goseva Ashram)

12. Veterinary Dispensary Siolim

13. Veterinary Dispensary Pirna

14. Veterinary Dispensary Calangute

**Other establishments of the Department**

1. Disease Investigation Unit, Tonca - Caranzalem
2. Key Village Scheme, Curti – Ponda
3. Farmers Training Centre, Curti – Ponda
4. Cattle Breeding Farm, Copardem, Sattari
5. Government Piggery Farm, Curti Ponda
6. Government Poultry Farm, Ela, Old – Goa.
7. Egg Marketing Centre, Panaji – Market Goa.

**List of Medicines (Veterinary Services)**

1. Inj. Hydrocortisone
2. inj. Dexamethasone
3. Inj. Adrenaline
4. Inj. Antihistamine
5. Inj. Xylocaine
6. Disposable I.V.sets.
7. Disposable syringes 10ml/5ml/2ml

8. Disposable needles No. 18,19,21,22
9. I.V. Fluids.
  - I. “ Dextrose 5% & 20%
  - II. “ Dextrose saline
  - III. “ Isotonoc saline
  - IV. Calcium borogluconate
10. Savlon/Detol
11. Tincture Benzoin
12. Xylocaine Skin Ointment
13. Himax Skin Ointment
14. Tincture Furicloride
15. Eye and Ear ointment

**List of instrument/ equipments (Veterinary Services)**

1. Airways with tongue clip
2. Oxygen cylinders with face mask, pressure gauge and flow meter
3. Artery forceps
4. Suturing needles

5. Tourniquets
6. Splints
7. Cotton
8. Bandages
9. Suction Machine (foot operated)
10. B.P. Surgical handle & blades
11. Stethoscope, torch and hammer
12. Foley's catheter and rubber catheter
13. Kidney tray
14. Crepe bandages and elastic bandages
15. Scissors with sticking plaster
16. Saws
17. Post mortem sets
18. Post mortem gloves
19. Gum boots
20. Apron
21. Shaving blades
22. Soap

## APPENDIX-XII

# ORGANISATION CHART OF POLICE DEPARTMENT FOR NORTH GOA DISTRICT

1. Police Headquarter headed : Porvorim.

by Superintendent of Police :

2. S.D.P.O. Offices : 5 ( Panaji, Mapusa, Porvorim,

Bicholim & Ponda.)

3. No. of Police Stations : 12

Sr. No.	Police Station/Unit	SP	DySP	PI	PSI	ASI	HC	LHC	PC	LPC
1	S.P. North Office	01	-	-	01	-	01	03	04	02
2	SDPOs	-	05	-	-	-	-	-	-	-
3	Panaji PS	-	-	01	05	05	14	02	91	02
4	Old Goa PS	-	-	01	02	01	08	01	51	02
5	Agacaim PS	-	-	01	01	02	13	-	39	-

6	Mapusa PS	-	-	01	06	03	17	02	84	03
7	Anjuna PS	-	-	-	03	01	09	03	46	01
8	Pernem PS	-	-	01	01	05	08	01	56	03
9	Porvorim PS	-	-	01	02	02	11	02	46	01
10	Calangute PS	-	-	01	03	01	12	02	51	01
11	Bicholim PS	-	-	01	03	04	18	03	75	03
12	Valpoi PS	-	-	01	01	01	07	02	39	01
13	Ponda PS	-	-	01	05	03	17	04	89	-
14	Collem PS	-	-	01	-	01	06	-	26	01
15	PCR Porvorim	-	-	-	-	-	03	02	03	01
<b>TOTAL</b>		<b>01</b>	<b>05</b>	<b>11</b>	<b>33</b>	<b>29</b>	<b>144</b>	<b>27</b>	<b>700</b>	<b>21</b>

**PCR Porvorim      Tel. Ph. No.**

**Fax No.2416251**

## APPENDIX – XIII

### Staff Infrastructure facilities available with the Forest Department

#### I. STAFF

Sr. No.	Designation of the official	Number
1	Dy. Conservator of Forests	1
2	Sub Divisional Forest Officer	1
3.	Asstt. Conservator of Forests	1

#### II. BUILDING

Sr. No.	OFFICE BUILDING	PHONE
1	North Goa Division, Ponda	2312095 2312856

## **PONDA RANGE**

### **I. STAFF**

<b>Sr. No.</b>	<b>Designation of the official</b>	<b>No.</b>
1	Range Forest Officer	1
2	Dy. Range Forest Officer	1
3	Round Forester	3
4	Forest Guard	15

### **II. BUILDING**

<b>Sr. No.</b>	<b>OFFICE BUILDING</b>	<b>PHONE</b>
1	Range Forest Office, Ponda	2317822
2	Forest Rest House, Dhavali	2318884

## **PERNEM RANGE**

### **I. STAFF**

<b>Sr. No.</b>	<b>Designation of the official</b>	<b>No.</b>
1	Range Forest Officer	1
2	Dy. Range Forest Officer	1
3	Round Forester	2
4	Forest Guard	15

### **II. BUILDING**

<b>Sr. No.</b>	<b>OFFICE BUILDING</b>	<b>PHONE</b>
1	Range Forest Office, Tuem	2201367

## **VALPOI RANGE**

## I. STAFF

<b>Sr. No.</b>	<b>Designation of the official</b>	<b>No.</b>
1	Range Forest Officer	1
2	Dy. Range Forest Officer	1
3	Round Forester	5
4	Forest Guard	18

## II. BUILDING

<b>Sr. No.</b>	<b>OFFICE BUILDING</b>	<b>PHONE</b>
1	Range Forest Office, Valpoi	2374223
2	Forest Rest House, Valpoi	2374723

## **KERI RANGE**

### **I. STAFF**

<b>Sr. No.</b>	<b>Designation of the official</b>	<b>No.</b>
1	Range Forest Officer	1
2	Round Forester	2
3	Forest Guard	11

### **II. BUILDING**

<b>Sr. No.</b>	<b>OFFICE BUILDING</b>	<b>PHONE</b>
1	Range Forest Office, Tulshimal	2364931
2	Forest Rest House, Keri	2369444

## **PANAJI RANGE**

### **I. STAFF**

<b>Sr. No.</b>	<b>Designation of the official</b>	<b>No.</b>
1	Range Forest Officer	1
2	Round Forester	2
3	Forest Guard	9

### **II. BUILDING**

<b>Sr. No.</b>	<b>OFFICE BUILDING</b>	<b>PHONE</b>
1	-----	2422244

## **TIMBER DEPOT**

### **I. STAFF**

<b>Sr. No.</b>	<b>Designation of the official</b>	<b>No.</b>
----------------	------------------------------------	------------

1	Range Forest Office	1
2	Forest Guard	1

## II. BUILDING

Sr. No.	OFFICE BUILDING	PHONE
1	Range Forest Office, Tisk Usgao	2345583

## DISASTER MANAGEMENT TEAM

### Division Level Disaster Management Team.

1. Dy. Conservator of Forests, North Goa Division, Ponda.
2. Sub Divisional Forest Officer, Ponda.
3. Asstt. Conservator of Forests, North Goa Division, Ponda.
4. Range Forest Officer, Mobile Squad, Ponda.

### Range Level Disaster Management Team (for each range).

#### I. PONDA RANGE

1. Range Forest Officer.
2. Dy. Range Forest Officer.

3. Round Foresters -----
  - a. Ponda.
  - b. Shrioda
  
  - c. Usgao.

## **II. VALPOI RANGE**

1. Range Forest Officer.
2. Dy. Range Forest Officer.
3. Round Foresters -----
  - a. Bhironda
  - b. Valpoi
  
  - c. Thane
  
  - d. Gawane
  
  - e. Kodal

## **III. KERI RANGE**

1. Range Forest Officer.
2. Round Foresters -----
  - a. Keri
  - b. Bicholim

## **IV. PERNEM RANGE**

1. Range Forest Officer.
2. Dy. Range Forest Officer.
3. Round Forester ----- a. Pernem  
b. Ibrampur

#### **V. PANAJI RANGE**

1. Range Forest Officer.
2. Round Forester ----- a. Tiswadi  
b. Bardez

## APPENDIX – XIV

### List of NCC/NSS / N.G.O.'s /Mahila Mandals / Clubs / NYK Units in Goa

NCC	Name	Address	Ph. No.	Chief Executive	Ph. No.	Resources	Nature of Activities
1 Goa Girls BN NCC, Panaji Commanding Officer	URS Bisht, Lt. Col. Officer Commanding	Shanta Bldg, 3 <sup>rd</sup> Floor, St. Inez, Panaji	2222032	N.A.	---	Govt. of Goa.	To impart training for NCC Cadets in various Colleges and High Schools covering Goa State.
1 Goa BN NCC, Panaji Commanding Officer	URS Bisht, Lt. Col. Officer Commanding	Shanta Bldg, 1 <sup>st</sup> Floor, St. Inez, Panaji.	2225391	N.A.	---	do	Do
1 Goa Naval Unit NCC, Panaji	Pradeep Paul Commander, Commanding Officer	Shanta Bldg, 3rd Floor, St. Inez, Panaji	2226564	N.A.	---	-do-	-do

Name of the Hr. Sec. School	Name, Address & Ph. No. of Principal	Name, & Ph. No. of Programme Officer	No. of NSS Volunteers		
			Boys	Girls	Total
A.V.A.M.'s Hr. Sec. School, Vazangal, Shiroda	Mr. Chandrakant D. Hede Tel. No. 2300517	<b>Mr. Purushottam Prabhu Desai</b> Tel No.2333634	29	31	60
B.B.S.S.V.S.L. Hr. Sec. School,Piliem, Dharbandoda –	Shri A. V. Kudchadkar Tel No. 2345714	Mr. Sandip T. Patil 2312309	99	64	163
Carmel Hr. Sec. School, Nuvem, Salcette – Goa.	Shri M. Anisha A. C. Tel. No. 2790625	1.Miss Sarvamangal D. Jangam Tel. no.2437417 2. Mrs. Niba Salelkar 2750939 3. Mrs. Renee Menezes 278235,		<b>319</b>	<b>319,</b>
Cuncolim United Hr. Sec. School, Cuncolim – Salcette	Mr. Meves Anthony Rebello Tel. No.2866251	M.rs Shobha M. Sawant Mr. Ajay H. Desai, Tel No.2701719	105	98	200
Damodar Hr. Sec. School, Gudi Paroda, Quepem – Goa.	Mr. Laxmikant S. Nayak Tel No.2602614	Arvind Kulkarni Jaikrishna R. N. Dessai Tel.No2865031 Subhada Vernekar Bandodkar Tel. No.2783261	70	50	120
DCT's Dempo Hr. Sec. School, (Com.) Miramar, Panaji- Goa.	Laxmi V. Moye Tel. No.2463423	Mrs. Lucia J. D'souza,9923495245 Mr. Ajay V. Joshi 2402592 Mrs. Maya D. Sardessai 9822220815	<b>211</b>	<b>105</b>	<b>316</b>

Deepvihar Hr. Sec. School, Head Land Sada, Vasco –	Mrs. Victoria D’Lima	Shrikant Palsarkar	168	187	355
Dempo CTS Hr. Sec. School, (Arts & Science) Miramar, Panaji.	Shri R. N. Sawardekar Tel. No. 2443800	Shri Sanjay M. Naik 9421150886 Mrs Sheetal R. Parab 2261546	<b>50</b>	<b>47</b>	<b>97</b>
D. M.’s Hr. Sec. School, Assagao, Mapusa – Goa.	Baban D. Pandit Tel. No. 2252890	Mr. Ruildo D’souza- 9822161059 Mrs Aquillia Periera Mrs Sheetal Natekar Mrs. Radhika Kalangut Mr. Rajendra Narvekar Mr. Sagar Salkar Mrs. Dipti Khalap Mr. Govindraj Dessai	<b>349</b>	376	725
D.M.’s Bicholims Hr. Sec. School, Mulgao, Assonora-Goa.	Mr. Prakash Dessai Tel. No.2456566	Jairam Kerkar –2484258 Govind Y. Ankhalee- 2364800 Purnima Parab- 2369224	32	28	60
<b>Don Bosco Hr. Sec. School, Panaji –Goa.</b>	<b>Fr. Paul D’souza Tel. No. 2221986</b>	<b>Mr. Josefa Pinto – 2228374 Mr. Jerson Colaco-2784301</b>	<b>104</b>	<b>79</b>	<b>183</b>

Dr. Ambedkar Hr. c Se. School, Colvale, Bardez		<b>Sanjay A. Parab-2210374</b>	174	104	278
Dr. T.B. Cunha Govt. Hr. Sec. School, Campal, Panaji-Goa.	Shri Ramesh W. Dhande Tel. No.2421668	<b>D. H. Kudav-2416686</b> S. V. Gawas – 2211343	103	45	148
Fr. Agnel Hr. Sec. School, Pilar, Tiswadi - Goa.	Fr. Frank Mendes Tel. No. 2218589	Mr. M. D. Hegde Mrs. Sarika Kamat Mr. Anant Fadke	<b>280</b>	<b>216</b>	<b>496</b>
Fr. Agnel Multipurpose Hr. Sec. School, Agnel Ashram, Verna.	Mr. Jose R. Rebello Tel. No. 2880133	Lucienne Viegas – 2730546 Yuonne Ribeiro – 5622502	<b>95</b>	<b>67</b>	<b>162</b>
Fr. Basilo Andrade Memorial Hr. Sec. School, Majorda – Goa	Mrs. Nirmala Misquita Tel. No.2771762	Mrs. Clotlda Mary Chris Tavares Lobo – 2765943	<b>67</b>	<b>64</b>	<b>131</b>
Govt. Hr. Sec. School, Baina, Vasco - Goa.	Mrs. Lira L Souza Tel No. 2521243	Shri Purushottam B. Malik- 2372185 Reshma Chanekar – 2743720	<b>89</b>	<b>61</b>	<b>150</b>
Govt. Hr. Sec. School, Khandola, Marcela - Goa.	Shri B. G. Naik Tel. No.2287259	Manoj Karapurkar Vishwas B. Naik – 2333620	<b>78</b>	<b>64</b>	<b>142</b>
Govt. Hr. Sec. School, Mastimol, Canacona – Goa.	Anand Shirodkar Tel. No. 2633718	Mr. Shaikh Amruddin – 2033203 <b>Ms V.A. Prabhugaonkar</b>	93	57	150
Govt. Hr. Sec. School, Pernem-Goa.	Shri H. S. Patil Tel. No. 2255050	Mr. Sanjay N. Divkar- 2275097 Mrs. Rajeshree Haldankar-2473615	<b>85</b>	<b>75</b>	<b>160</b>

Govt. Hr. Sec. School, Sanguem – Goa.	Shri Anand P. Kunde Tel. No. 2652145	Shri Dattatray G. P. Dessai- 2659669 Mrs. Vanita S. Prabhu Dessai- 9423317977	32	37	69
Govt. Hr. Sec. School, Valpoi, Sattari – Goa	Vijay V. Borkar Tel. No.2374262	Swati Prabhu Shastri Tulsidas Dessai- 9423813543	140	128	268
Govt. Multipurpose Hr. Sec. School, Borda, Margao – Goa.	Smt. Mangala Sawant Tel No. 2741670	Jotiba Ishwar Mali 9370565932	56	64	110
Guardian Angel Hr. Sec. School, Sanvordem – Goa.	Fr. Carlos Fernandes Tel. No.2650218	Mr. Anselmo S. Fernandes- 9822164795 Mrs. Fernandes Audrey-2662126	90	184	274
G.V.M.S Hr. Sec. School, Farmagudi, Ponda – Goa.	Shri S. N. Dessai Tel. No.2313933	Shri Ramkrishna Bhat- 2330252 Mrs. Urmila Naik- 2399544	119	181	300
Harmal Panchakroshi Hr. Sec. School, Harmal, Pernem –Goa.	Bhagirath G. Shetye Tel. No.2265409	Mrs. Vynniesha D’Souza- 2252048	33	19	52
Jawaharlal Nehru Hr. Sec. School, Fatorda, Margao Goa.	Mr. M. K. Shaikh Tel. No. 2740564	Mrs Archana Naik 9823844300 <b>Mrs. Rubina Sayed 2662884</b> Mrs. Kanchan Borkar	75	59	134
<b>Maria Bambina Hr. Sec. School, Cuncolim, Salcette-Goa.</b>	<b>Mr. Kochuthresai P. P. Tel. No.2763272</b>	<b>Mr. Suryadas T. Naik – 2784472</b>		<b>113</b>	<b>113</b>
Mount Mary’s Hr. Sec. School, Chinchani, Salcete-Goa.	Mrs. Melba Leitao Tel. No.2745124	<b>Miss Alzira Fernandes-2763725</b>	33	30	63

30 M.E.S. Hr. Sec. School, Zuarinagar – Goa.	Mrs. Melita Quadros Tel No.2741319	<b>Shri Narayan Mahale-9370568152</b> <b>Mrs. Medha Vererkar</b> Shri Avinash Pereira-9423055536	185	165	
31 Mustifund Hr. Sec. School, Panaji – Goa.	Shri Ratnakar G. Lele Tel. No.2229474	Raghuvir P. Shirodkar-9850072714	80	159	
32 New English Hr. Sec. School, Mandrem, Pernem- Goa.	Shri Ulhas R. Shetye Tel. No.2244429	Shri Arun N. Naik	80	100	
33 Our Lady of Rosary Hr. Sec. School, Dona-Paula – Goa	Shri Sybil Cordeiro Tel. No.2452887	Mrs Hafifa Khwaja –9823129768 Mrs Sucheta Pai-9890652759		236	
34 Peoples Hr. Sec. School, Mala, Panaji – Goa.	Mrs. Indu G. Naik Rane Tel. No. 2413240	Ashraf Ali Khan-9422639285 Santosh Virnodkar	170	180	
35 (PES) Shri Ravi S. Naik Hr. Sec. School, Farmagudi, Ponda Goa	Shri T. K. Gaonkar Tel. No.2330535	Rafeeahamad H. Nadaf-2333397	75	85	
36 Pope John XXIII Hr. Sec. School, Prem Nagar, Quepem-Goa.	Rev. Fr. Paul D’souza Tel. No.2664178	Mrs. Trupti K. Prabhu Desai Mrs Sandha B. Rodrigues-2664178 Shri Santosh A. Malik	50	45	
37 Raghuvir & Premavati Salkar Hr. Sec. School, Chora-	Shri Sumant S. Kanyalkar Tel.	<b>Baban S. Patil-9423059103</b>	27	23	

Goa.	No.2475350				
38 R.M.S. Hr. Sec. School, Tansor, Comba, Margao-Goa.	Shri Vinod V. Powar Tel. No.2752405	<b>Mr. K.S. Konanavar-2750812</b> Mrs. Ujwala S. More-2752722 Mrs. Maria Fatima D' Cunha-2753849	197	277	
39 Rosary Hr. Sec. School, Navelim, Salcete – Goa.	Mrs. Cherly Colaco Mr. Herman Santos Costa Pereira	Mr. Agnelo Fernandes	136	186	
40 Saraswat Vidyalaya's Hr. Sec. School, Khorlim, Mapusa-Goa.	Shri Subhash N. Naik 2250337	Subhash J. Pai-2472675 Beena J. Churi-2472745	80	150	
<b>41 Santa Cruz Hr. Sec. School, St. Cruz, Tiswadi – Goa</b>	<b>9822951895</b> <b>Mr.Nelson</b> <b>Rebello</b>	<b>Mrs. Maria Lourdes Tavares e Valawalkar Tel.No.2277031</b> <b>Mrs. Melita Fernandes 2459546</b>	42	34	
42 S.E.S. Hr. Sec. School, Usgao – Goa.	Mr. M. R. karnataka Tel. No.9890747478	Mrs. Sushma M. Gobre Vaidya Tel. No.2318812	55	85	
43 Shantadurga Hr. Sec. School, Sancoale – Goa	Mr. Subhash Y. Naik Tel. No.2752711	Mr. Mario Diniz-2767870 Mr. Sadashiv Bipin Narvenkar	103	60	
44 Shiroda Hr. Sec. School, Shiroda – Goa.	Mr. Laxman K. Divan Tel. No.2306840	Mr. Satish B. Naik-2700388	140	90	
45 Shree Ameya Vidyaprasarak M. Hr.	Shri Diago S. D'souza Tel	Mr. Subhash B. Jan-2340346	68	82	

Sec. School, Curti-Ponda.	No.2651161				
46 Shree Navdurga Hr. Sec. School, Marcaim, Mardol-Goa.	Mr. S.S. Phadte Tel. No. 2313914	Mr. Jaiprakash Bhiva Naik 2325025	36	19	
47 Shree Shantadurga Hr. Sec. School, Pirna, Bardez	Mr. Umesh P. Naik	<b>Mr. Rajanikant C. Sawant</b> <b>2610113</b> Mr. Bhagwan M. Harmalkar	53	28	
48 Shri Bhumika Hr. Sec. School, Paryem, Sattari –Goa.	Dr. Sadanand S. Hinde Tel.No.2365977	Shri Shankar L. Chari Shri Anand B. Parulekar Ms. Varsha Naik	140	163	303
49 Shri Kamaleshwar Hr. Sec. School, Korgao Pernem	Shri Ramchandra M. Barve Tel. No.2241414	Shri Vithoba U. Bagli- 2246355	81	74	155
50 Shri Saraswati Hr. Sec. School Kavlem, Ponda- Goa.	D. L. Panchwadkar Tel. No. 2312746	Shri Tiaf C. Silveira-2392389 Mrs. Sarita K. Parab-2314773	48	52	100

51	Shri Shantadurga Hr. Sec.School, Bichoim	Shri G.D. Delaney Te.No.2362188	Shri R.L. Patkar Shri Mukund B.Harmalkar	120	80
52	Shri Vijayanand D.S. Hr. Sec. School, Mayem-Goa	Shri Raghunath Gauns Tel.No.2362662	<a href="#">Shri Hemant Sabnis</a> Mrs. Sybil Fernandes- 24448242	49	41
53	Sidharth Bandodkar	Shri Ani Mahadev Vernekar	<a href="#">Shri Uday C.Mandrekar2214485</a>	68	46

	Hr.Sec.School, Velguem,Bicholim	Te.No.2364712	Shri Virupaxi C. Yeligan		
54	Smt. C.T.Naik Hr.Sec.School Curchorem-Goa	Shri Vaman U.Bhadri Tel.no.2659145	<a href="#">Nandkumar R 2653915</a> Rajan Bandekar 9860232001  Tusidas Popkar- 9860491166	180	230
55	Smt.Parvatibai Chowgule Hr.Sec. School,Margao-Goa	Dr.R.V.Gaonkar Te.No.2741090	<a href="#">Shri Ashok M.Patil-</a> 9960319060	80	110
56	St.Aex Hr.sec School,Curtorim, Salcete-Goa	Paramjyoti Desai Te. No.2315644	<a href="#">Mr.Promod Harmalkar</a> 9881811243	68	62
57	St.Andrew Hr. Sec. School,Vasco-da- Gama	Gen Da Costa 2702014	<a href="#">Mr.Glen D'Costa</a> Mr. Pramod surikar	70	93
58	St.Francis Xavier's Hr.Sec.School, Siolim,Bardez-Goa	Fr.A.Paul Sagayam Te.No.2272230	<a href="#">Mrs.Radha D'Sousa</a> Shri Prakash L.Naik- 2473620  <a href="#">Mrs.Sandhya Fernandes – 2293514</a>	80	95
59	St.Tereza's Hr.Sec.School,	Dr.Elvis Gonsalves Te.No.2458935	<a href="#">Mr. Manoj R.Naik-</a> <a href="#">2366024</a> Mr. Anrece P.Pinto-	66	50

	Candolim-Goa		2413204		
60	St.Thomas Hr.Sec School,Aldona, Bardez-Goa	Fr.Sunny Joseph K. Tel.No.2293812	<a href="#">Mr.Amarnath V.Panjikar-2484233</a> Mr.Dhinaj Warkar	65	75
61	St.Xavier's Hr.Sec.School,P.O. Box No.32,Mapusa- Goa	Mr. Mervyh D'Souza Tel.No.2268407	<a href="#">Mr. Deelip Dhargalkar</a> Ms.Michelle Coeho  Mr. Vijay Parab  Ms.Rachel D'Souza  Ms.Shevanti Malpekar	397	418
62	S.S.Angle's Hr. sec. School, Mashem,Loliem-Goa	Dr.Narayan B.Dessai	<a href="#">Mr.Ravindra Phal Desai-2641297</a> Mr. Anant S.Sinai Agni- 2632012  Mr. Anthony Barreto- 2641222	54	50
63.	Swami Mandal,s Hr.Sec.School, Shirshire Borim-Ponda	Mr. M.T.Upadhye Te.No.2333037	<a href="#">Mr. Vivek Y.Nabar-</a> 2378220	78	58
64	The kamakshi Edn. Hr.Sec.School, Curti,Ponda-Goa	Francis Luis Fernandes Te.No.2316588	<a href="#">Rajaram Namdeo Naik</a> 2317339  Nik Surekha Subhash Vaz Louis Joao	60	70
65 V.A.R.D.'s Gaonkar Hr.		Mrs. Sylvia D'Souza Tel.	Mr. Reuben C. Costa-	108	39

Sec. School, Raia-Salcete-	No.2777434	2790686		
66 Vidya Prabodini Hr. Sec. School, B.B.Borkar, RD Porvorim Goa	Shri Subhash Velingkar Tel. No.2228407	Shri Vilas G. Palkar- 9422634366 Shri Sanjay V. Sawaikar- 9422636202	98	102
67 Vishwanath M.P. Hr. Sec. School, Verem-Goa.	Shri Umakant D. Salkar Tel. No.2402878	Shri Prashant Naik- 9850455297	49	45
68 Vividha Hr. Sec. School, Navelim, Sanquelim-Goa.	Shri Gurudas P. Gawas Tel. No.3217280	Mrs Rakhi Shirodkar- 2366007 Mrs. Sunita Phadte-2288074	117	83
69 V.V.S. Kunkolienkar Hr. Sec. School, Ella,Old-Goa.	Shri Ramakrishna S. Samant Tel. No.2333842	Shri Savio E. Vaz – 9860609969	48	32
70 Vivekanand Hr. Sec. School, Quepem-Goa	Shri Damu R. Naik Tel. No. 2670181	Rupesh Fal Dessai- 2670215	70	37
<b>TOTAL</b>			6640	8466

**NSS Units in Various Colleges in the State of Goa.**

Sr. No.	Name of the College	Name Address & Phone No. of Principal	Name Address & Phone no. of Programme Officer	No. of NSS Volentiers		
				Boys	Girls	Total
1	Smt. Parvatibai Chowgule College of Arts & Science, Margao	Dr. R. V. Gaonkar Tel. No.2759504	Mr. Yatin Dessai Mr. D. Prabhu – 9860597125	168	389	557
2	Shree Damodar	Dr. Bhanu	Mr.s. Lira Gama –	201	317	518

	College of Commerce & Economics, Margao.	Murthy Tel. No.2714224	2791308			
3	M.E.S College of Arts & College, Zuarinagar	Dr. Rajiv Harjinis Tel. No.255772	Mr. Ashish Joshi – 2306836	108	275	383
4	Carmel College of Arts, Science & Commerce, for Women, Nuvem	Shri Ema Maria A.C. Tel. No.2790714	Miss Queenie Viegas – 9823756597 Glaney Bouges – 9880468993	- - -	230	230
5	DPM's Bandekar College of Arts, Science & Commerce, Mapusa.	Dr. D. B. Avolkar Tel. No.2268488	Mr. Amrut Naik – 9423813403	210	300	510
6	Dhempe College of Arts & Science, Panaji.	Mr. S. V. Deshpande Tel. No.2462376	Mr. Manoj Ibrampurkar	75	158	233
7	S.S. Dempo College of Commerce & Economics , Altinho, Panaji.	Dr. V. R. Naik Tel No.2226806	Mr. Shashikant Morajkar- 9923326177	106	216	322
8	St Xavier's College of Arts, Science & Commerce, Mapusa.	Mr. Newman Fernandes Tel. No. 2262356	Mr. Manoj Salgaonkar- 2257016	255	627	882
9	PES College of Arts & Science, Farmagudi.	Dr. Anil Dinge Tel.No. 2361377	Mr. Sandeep Lotlikar	118	329	447
10	GVM's College of Commerce & Economics, Ponda	Mr. P. N. Bhende Tel. No. 2335875	Mr. P. N. Mashe – 9423314925	138	195	333
11	CES College of Arts & Commerce, Cuncoim.	Dr. Laxman Naik Tel. No.2865210	Mr. Nityanand Naik	147	127	275
12	Govt. College of Arts, Science & Commerce,	Dr. J. B. Fernandes Tel.	Shri Ashok	217	347	564

	Sanquelim.	No.2364271	Chodankar			
13	Govt. College of Arts, Science & Commerce, Quepem.	Mr. B. G. Nayak	Mr. Rajan Pawar	140	308	448
14	Govt. College of Arts, Science & Commerce, Khandola.	Dr. Lucas Miranda Tel. No.2287718	Mrs. Suchita Kalangutkar-9423060375	120	244	364
15	Govt. College of Arts, & Science, Pernem-Goa.	Dr. B.A. Gomes Tel. No.2201210	Ishani Roy – 9822201032	39	50	89
16	Fr. Agnel College of Arts & Commerce, Pilar.	Fr. Fedrick Rodrigues	Mr. Anthony D'souza-9226789926	101	161	162
17	Rosary College of Commerce & Arts, Navelim.	Fr. Walter D'sa Tel.No.2736864	Mr. Helic Barretto	192	450	642
18	Saraswat College of Commerce & Management Studies, Mapusa.	Mr. D. M. Deshpande Tel. No.2250042	Dr. Santosh Patkar- 2472332	159	186	345
19	Narayan Zantye College of Commerce, Bicholim	Mr. Arun R. Sakhardande Tel.No.2361377	Mr. Sudhir Halvegen 9422576327	101	177	278
20	Shree Mallikarjun College of Arts & Commerce, Canacona.	Dr. G. S. Badiger Tel. No.2633433	Mr. Sandesh Sawant-2754995	59	123	182
21	Shri Kamaxidevi Homoeopathic Medical College & Hospital, Shiroda.	Dr. Arvind Khothe Tel. No.2306848	Dr. Shulila Shirwaikar – 5622431	<b>37</b>	<b>113</b>	<b>150</b>
<b>22</b>	Goa College of Home	Mr. Rajal Shinkre	Smt. Varsha Naik		<b>41</b>	<b>41</b>

	Science, Campal, Panaji	Tel. No.2227603				
23	V.M. Salgaonkar College of Law, Miramar, Panaji.	Mr. Marian Pineono Tel. No.2462225	Mr. Sahadev Mandrekar	112	40	152
24	G.R. Kare College of Law, Margao-Goa	Mr. A. G. Nadkarni Tel No.2715510	Miss Goretti Simoes-9822103653	51	69	110
25	Ayurvedic College & Hospital, Shiroda.	Dr. Viraj Shukla Tel. No.2306309	Dr. Viraj Shukla – 9822936193	4	16	20
<b>Total</b>				<b>2858</b>	<b>5379</b>	<b>8237</b>

	<u>Boys</u>	<u>Girls</u>	<u>Total</u>
<b>70 Higher Secondary School</b>	<b>6640</b>	<b>8466</b>	<b>15106</b>
<b>25 Colleges</b>	<b>2858</b>	<b>5379</b>	<b>8237</b>
<b>Total</b>	<b>9498</b>	<b>13845</b>	<b>23343</b>

### List of NYK Units in Goa

<b>Sr. No.</b>	<b>Name of Youth Club</b>	<b>No. of members</b>	<b>Taluka</b>	<b>Village</b>	<b>Leader</b>	<b>Ph.No.</b>	<b>Special Activity</b>	<b>Whether Trained on DM</b>
1	Shesh Kala & Sanskrutik Mandal	20	Sattari	Malole	Nandakishor Kopardekar		Social & Cultural	Yes
2	Shantadurga Yuva Saustha	15	Sattari	Guleli	Tukaram Naik	9421157726	Socio Cultural	Yes
3	Dnyanadeep Prasarak Mandal	15	Sattari	Bhramha karmali	Milind Gadgil	9421151953	Socio Educational	Yes
4	Bharavansh Cultural & Sports Club	20	Sattari	Morlem Colony	Dattajirao Gawas		Cultural & Sports	Yes
5	Mashal Kala Krida Sanskrutik Sanghathan	15	Sattari	Keri	Laxman Gawas		Cultural & Sports	Yes
6	Sateri Sports & Cultural	15	Sattari	Kelwade,	Rawan		Cultural & Sports	Yes

	Club							
7	Tal Khameshwar Sports Club	20	Sattari	Tamidgi Parye	Narayan Rane	9923144133	Socio Cultural Sports	Yes
8	Shriram Ganesh Kala Sanskrutik Mandal	15	Sattari	Khadki	Swati Rane		Socio Cultural	Yes
9	Swami Vivekanand Smruti Sangh	20	Sattari	Keri	Durgesh Majik		Socio Cultural	Yes
10	Hanuman Sports & Cultural Club	20	Sattari	Vante, Advai			Socio Cultural & Sports	Yes
11	Dynamic Youth Association	20	Bicholim	Kurchire	Rajendra Usapkar	9226772733	Socio Cultural	Yes
12	Manojkumar Youth Association	15	Bicholim	Amona	Manojkumar Ghadi	9226779739	Socio Cultural & Educational	Yes
13	Nehru Youth Association	20	Bicholim	Sanquelim	Sameer Prabhu	9823523408	Socio Cultural & Educational	Yes
14	Sai Sports & Cultural	20	Bicholim	Kothambi	Dr. Pramod Sawant	9422635922	Socio Cultural & Educational	Yes
15	Vathadev Kala	15	Bicholim	Vathadev	Anant		Socio	Yes

	Sanskrutik Mandal				Sawant		Cultural	
16	Sharda Cultural Sports Club	15	Bicholim	Narve	Ladu Parwar		Socio Cultural	Yes
17	Shyampurush Kala Sangh	20	Bicholim	Sarvan	Pundalik Sawant	9422439334	Socio Cultural	Yes
18	Fun Club of Mayem	20	Bicholim	Mayem	Krishna Parab	9822828708	Socio Cultural	Yes
19	Sakhaleshwar Youth Club	15	Bicholim	Maulinge	Madhu Naik		Socio Cultural	Yes
20	Vidhyaprasarak Nehru Yuva Mandal	20	Bicholim	Padose	Mohan Gaonkar		Socio Cultural	Yes
21	Hanuman Sports Club	20	Ponda	Khandepar	Shailesh Khandeparkar	9823533891	Socio Cultural & Sports	Yes
22	Dhawali Gymkhana Goa & Sports	15	Ponda	Dhawali	Nilesh Naik	9890249249	Socio Cultural	Yes
23	Shri Shantadurga Sanskrutik Mandal	15	Ponda	Tiverem	Bhanudas Gaude		Socio Cultural & Sports	Yes
24	Balve Sports Club	20	Ponda	Tiral-Usgao	Sanjay Naik		Cultural & Sports	Yes

25	Akshay Kala Mandal	20	Pernem	Korgao	Suraj Prabhudesai		Socio Cultural	Yes
26	Sidhi Utkarsh Kala Mandal	15	Pernem	Palye	Satyawan Palyekar		Socio Cultural	Yes
27	Birondem Sports Club	15	Sattari	Bironda	Valeriano Andrade		Cultural Sports Club	Yes
28	Bhumika Yuvak Mandal	20	Pernem	Mandre m	Amit Sawant	9423314150	Socio Cultural	Yes
29	Keri Youth Club	20	Sattari	Keri	Namdev Kerkar		Socio Cultural	Yes
30	Yuvak Kala Manch	15	Bicholim	Pilgaon	Vinay Gaonkar		Socio Cultural	Yes

**TISWADI TALUKA**

<b>Name of Village</b>	<b>Name of NGO</b>	<b>Name of Officer-in-charge</b>	<b>Address &amp; Phone No.</b>
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
1.CALAPUR	NIL		
2.SE OLD GOA	1.Royal Club	Vishal Volvoikar	SE Old Goa
	2.Boys of Old Goa	--	-do-
	3.Mahila Mandals	Kishori Amonkar	Panvelim, Se Old Goa
3.AGASSAIM	NIL		
4.SAO MATHIAS	1.Sao Matias Sport Club	Edwin Vaz	Malar, Sao Matias
5.CURCA	1.Ana Sports Club, Santan	Jerry D'mello	--

BAMBOLIM TALAULIM	2.Nagesh Matarudra Kala Sangh, Curca	Pandurang Narvekar	--
6.CARAMBOLIM	1.Navabharat Sport Club, Carambolim	Bhalchandra Usgaonkar	Saklembhat, Carambolim
	2.Mahila Mandals	Anapurna Shirodkar	--
7.AZOSSIM MANDUR	1. St. Mathews Sports Club	Nazareth Dias	Azossim, Dulbalem
8.SIRIDAO	1.Jesus Nazareth Sports Club, Siridao	--	--
	2.N.C.C. Sports Club, Palem	--	--
	3.Siridao Sports Club, Siridao	--	--
9.ST.ESTEVAM	1.Casa do Povo	Orlando Menezes	St. Estevam
10.CUMBARJUA	1.Sunrise Sport Club	Suryakant V. Gaude	Gawant Wado 9822127636
	2.Dattatray S. Club	Rajendra More	Talap Wado 2287046
	3.Patrick Sport Club	Devendra Chodankar	Rambhuvan wado - 2288116.
	4.Dhodeshwar S. Club	Amay Parab	Khadap Wado
11.GOLTIM NAVELIM	1.Piedade Youth Association	Anil Pereira	Goltim Navelim
12.TALEIGAO	Sao Minguel, Taleigao	--	Taleigao
13.MERCES	Club of Mercedes	--	Mestabhat, Mercedes
14.CORLIM	1.Raju De sa		Bellavista, Corlim 2284620
	2.Denzil Fernandes		Volvado, Corlim
	3.Pradeep Naik		H.B. Colony, Corlim
	4. Prakash Naik		-do-
	5. Ganu Jalmi		Mangado, Corlim
	6.Purushottam Dhulapkar		Dhulapi, Corlim

	7.Vinayak Dhulapkar		-do-
15.CHORAO	1.Chorao Cricket Club	--	--
	2.Lions Club Chorao	--	--
	3.Yayce Club Chorao	--	--
16.CHIMBEL	1.Child Integrated Programme	Suman Parulekar	Indira Nagar, Chimbel
	2.Mahila Mandal	Under the leadership of Mohan Ranade	-do-
	3.Asylum of Provedoria	Govt. of Goa	Chimbel
17.BATIM	Batim Youth Club	Brito Aguiar	Portel Bhat, Batim.
18.GOA VELHA	NIL		
19.NEURA	1.Union Cricket Club	Bajirao sawant	Neura, Dhondebhat
20.PANAJI	1.Gomantak Maratha Samaj Panaji	--	Dayanand Smruti, SVR, Panaji
	2.National Club Panaji	--	M.G.Road, Secretariat, Panaji
	3.Don Bosco High School, Panaji	--	M.G.Road, Panaji Market

**BARDEZ TALUKA**

Sr.No.	Name of Club	Name of Officer In Charge	Address & Phone No.
1	St. Rita Club Carona	Michael D'souba	2293736
2	Quitla Sports Club	Joao R. Fernandes	2293471
3	St. Domic Club	Mr. Sebastina	9326114675

4	Khorjuem Ghymkhana Korjuem	Mr. Antonio Soares	Korjuem
5	Pilerne Sport Club	-----	Village Panchayat Blg. Pilerne Maina
6	Olaulim Pomburpa Sports Ass.	Davis Fernandes Camilo Fernandes	Olaulim Pomburpa
7	Sai Sport Club	-----	Verla Canca
8	Siddheshwar Self Help Group (Mahila Mandal)	Nirmala Raul	Ucassaim.
9	Assuciacao Academica De Moira	Romeo Coelho	Bombordem
10	ABC Club Bambordem	Rupesh G. Naik	9822160149
11	S.C.A.N. Club	Armando Nazareth	Borvon Wado, Ucassaim
12	F.C. Club	-----	Siolim
13	St.Sebastian Club	-----	Marna
14	Tropa Club	-----	Sodiem

**PERNEM TALUKA**

Sr. No.	Name of Village	Name	Name of club / Organisation
1.	Paliem	President: Satyawan A. Palyekar	Siddhi Kala Utkarsh Mandal
2.	Deulwada, paliem	Head Master: Mohan Naik	G.P.S. Madhalawada Palye

3.	Gawadewada, Corgao	Incharge: Krishna Gawade	Akshay Kala Mandal
4.	Tembwada, Morjim	Joaquim D'Souza	Social Worker
5.	- do -	Lawrence Fernandes	Social Worker
6.	- do -	Satish D. Morje	Social worker
7.	Chopdem, Agarwada	Sadanand V. Parsekar	Social Worker, Ph.No.2246718
8.	- do -	Babli R. Raut	Social Worker
9.	Duelwada, Dhargal	Sandesh Karapurkar	Shantadurga Sports Club Phone No.2240419
10.	Talewada, Dhargal	President : Vinayak G. Bandodkar	Diamond Sports Club Phone No.2240190
11.	Gaonwada, Dhargal	President : Rajendra Kundaikar	Abhijit Sports Club Phone No.2240240
12	Warkhand	Padma Pandurang Parab	2207142
13	- do -	Vanita Govind Mone	
14	Gaonkarwada, Tuem		Kamdheni Mahila Mandal
15	- do -	Sweta Naik	Bhagwati Sanskrutik Yuvak Sangh
16	Katurli, Tuem	Vishal Shetye	Tuem Sports Club

**BICHOLIM TALUKA**

<b>Sr.No.</b>	<b>Name of the Organisation</b>	<b>Name of the President /Secretary</b>
1. Advalpal	Shantadurga Sports Club	-----
2. Amona	a) Saibaba Sports Club b) Amravati Sports Culb c) Sankritik Sangh Manojkumar Youth Culb. d) Amona Gymkhana	Gajanan P. Parab, Ph. No. 2386116  Vilind P. Sawant, Ph. No. 2386019  Manoj S. Ghadi., Ph. No. 2386195   Dattaguru L. Amonkar, Ph.No. 2386024.
3. Bicholim Bordem Lamgao	a) Bicholim Junior Chamber b) Rotary Club of Bicholim c) Lions Culb of Bicholim  d) Samrat Club of Bicholim	Rajesh Chadichal r/o Valshi, Ph.No.2361329  Anand Dessai, r/o Lamgao, Bicholim, Ph.No.2362550  Dr. Suresh Mandrekar, Antil Peth, Bicholim, 2362563  Kamlakar Teli, Sharda Colony, Bordem, Ph.No. 9326121620
4. Carapur	a) Subhash Friends Circle Club b) Vaibhav Sports Club c) Shantadurga sports Club d) Kulmaya Sports Club	Dattaram T. Sawant   Shantaram Mayekar, Ph. No. 2364293  Ashok Gaonkar  Deepak Kumbharjuvekar

5. Cotombi	Chandreshwar Sport Club	-----
6. Cudnem	a) Samrat Sport Club b) Adarsh Sport Club c) Sagar Sport Club	Mahendra Ekavade Santosh A. Malik Arjun A. Malik
7. Curchirem		-----
8. Dumacem	a) Sateri Club	----
9. Harvalem	a) Pratab Nagar Sports Club & Cultural Association.	----
10. Latambarcem	a) Shantadurga Sport Club, Nanoda b) Shri Santeri Sport Club, Ladfem c) Shri Santeri Sport Club, Kharpal	Shyam Harmalkar Mb. No. 9370620560  Mono D. Malik, Ph. No. 2380140  Umesh Gawas
11. Maulinguem (S)	a) Shantadurga Sports Club b) Gauthan Yuvak Sangh c) Maulingtad Sports Club	--- --- ---
12. Mencurem	a) Mauli Youth Club b) Loyal Sports Club c) Nutan Youth Club	-- --  Neelam Naik
13. Mulgao	a) Mulgao Youth Club b) Sai Sports Club	Ramesh Shirgaonkar

		Chandrashekhhar Raut
14. Navelim	a) Vividha Sports Club b) Shikshan Vikas Sanghatana	Gurudas P. Gawas Anil Gawas
15. Piligao	a) Piligao Sports Club b) Youvak Kala Manch	--- --
16. Salem	O.S.C. Club, Sal.	--
17. Sanquelim	a) Lions Club  b) Eagle Sports Club	Agnelo D'Silva (President)  Pravin Blagan (Secretary)  Nanath Naik (President)  Prashant Fatarpekar (Secretary).
18. Sirigao	a) Sirigao Sports Club b) Gymkhana Club	-- ---
19. Surla	a) Sai Sports Club , Kotambi Pale b) Gurunath Sports Club, Rumad Pale  c) Apolo Sport club, Chawadi, Pale	Ravi B. Parab, Ph.No. 2372072 ( President)  Rupesh L. Parab (Secretary)PhNo.2372057  Laurence M. Fernandes, Ph.No.2372280 (President)  Rama Tari ( Secretary) Ph. No. 2372329  Sameer Chawdikar Mo. No. 9890426244 (President )

		Vishwas Chawdikar ( Secretary)
20. Viridi	a) A.N.S. Sports Club b) Navneet Sports Club c) Star Eleven Sports Club.	--- --- ---

**SATTARI TALUKA**

1	Valpoi Citizens Forum	Valpoi
2	Citizens Sports Club	Valpoi
3	Trishul Sports Club	Valpoi
4	Vikas Youth Club	Copardem
5	Brahmani Sports Club	Copardem



List of NYK Units in Goa

Sr. No.	Name of Youth Club	No.of members	Taluka	Village	Leader	Ph.No.	Special Activity	Whether Trained on DM
1	Shesh Kala & Sankruit Mandal	20	Sattari	Malole	Nandakishore Kopardekar		Social & Cultural	Yes
2	Shantadurga Yuva Saustha	15	Sattari	Guleli	Tukaram Naik	9421157726	Social Cultural	Yes
3	Dnyanadeep Prasarak Mandal	15	Sattari	Bramhak Karmali	Milind Gadgil	9421151953	Socio Educational	Yes
4	Bharavansh Cultural & Sports Club	20	Sattari	Morlem Colony	Dattajirao Gawas		Cultural & Sports	Yes

5	Mashal Kala Krida Sanskrutik Sangathan	15	Sattari	Keri	Laxman Gawas		Cutural & Sports	Yes
6	Sateri Sports & Cutura Club	15	Sattari	Kelwade Rawan			Cultural & Sports	Yes
7	Tal Khameshwar Sports Club	20	Sattari	Tamidgi Parye	Narayan Rane	9923144133	Socio Cultural Sports	Yes
8	Shriram Ganesh Kala Sanskrutik Mandal	15	Sattari	Khadki	Swati Rane		Socio Cultural	Yes
9	Swami Vivekanand Smruti Sangh	20	Sattari	Keri	Durgesh Majik		Socio Cultural	Yes
10	Hanuman Sports & Cultural Club	20	Sattari	Vante Advai			Socio Cultural & Sports	Yes
11	Dynamic Youth Association	20	Bicholim	Kurchire	Rajendra Usapkar	9226772733	Socio Cultural	Yes

12	Manojkumar Youth Association	15	Bicholim	Amona	Manojkumar Ghadi	9226779739	Socio Cultural & Educational	Yes
13	Nehru Youth Association	20	Bicholim	Sanquelim	Sameer Prabhu	9823523408	Socio Cultural & Educational	Yes
14	Sai Sports & Cultural	20	Bichoim	Kothambi	Dr.Pramod Sawant	9422635922	Socio Cultural & Educational	Yes
15	Vathadev Kala Sanskrutik Mandal	15	Bicholim	Vathadev	Anant Sawant		Socio Cultural	Yes
16	Sharda Cultural Sports Club	15	Bicholim	Narve	Ladu Parwar		Socio Cultural	Yes
17	Shyampurush Kala Sangh	20	Bicholim	Sarvan	Pundaik Sawant	9422439334	Socio Cultural	Yes
18	Fun Club of Mayem	20	Bicholim	Mayem	Krishna Parab	9822828708	Socio Cultural	Yes
19	Sakhalesh	15	Bicholim	Maulinge	Madhu Naik		Socio	Yes

	war Youth Club						Cultural	
20	Vidhyaprasarak Nehru Yuva Manda	20	Bicholim	Padose	Mohan Gaonkar		Socio Cultural	Yes
21	Hanuman Sports Club	20	Ponda	Khandep ar	Shailesh Khandepark ar	9823533891	Socio Cultural & Sports	Yes
22	Dhavali Gymkhana	15	Ponda	Dhavali Goa	Nilesh Naik	9890249249	Socio Cutural & Sports	Yes
23	Shri Shantadurga Sanskrutik Mandal	15	Ponda	Tiverem	Bhanudas Gaude		Socio Cutural & Sports	Yes
24	Balve Sports Club	20	Ponda	Tisk Usgao	Sanjay Naik		Cutural & Sports	Yes
25	Akshay Kala Mandal	20	Pernem	Korgao	Suraj Prabhudesai		Socio Cutural	Yes
26	Sidhi Utkarsh Kala Manda	20	Pernem,	Palye	Satyawan Palyekar		Socio Cutural	Yes

27	Birondem Sports Club	15	Sattari	Bironda	Valeriano Andrade		Cultural Sports Club	Yes
28	Bhumika Yuvak Mandal	20	Pernem	Mandrem	Amit Sawant	9423314150	Socio Cultural	Yes
29	Keri Youth Club	20	Sattari	Keri	Namdev Kerkar		Socio Cultural	Yes
30	Yuvak Kala Manch	15	Bicholim	Pilgaon	Vinay Gaonkar		Socio Cultural	Yes

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<sup>i</sup>In the Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 (hereinafter referred to as the said rules) : "major accident hazards (MAH) installations" means - isolated storage and industrial activity at a site handling (including transport through carrier or pipeline) of hazardous chemicals equal to or , in excess of the threshold quantities specified in, column 3 of schedule 2 and 3 respectively;