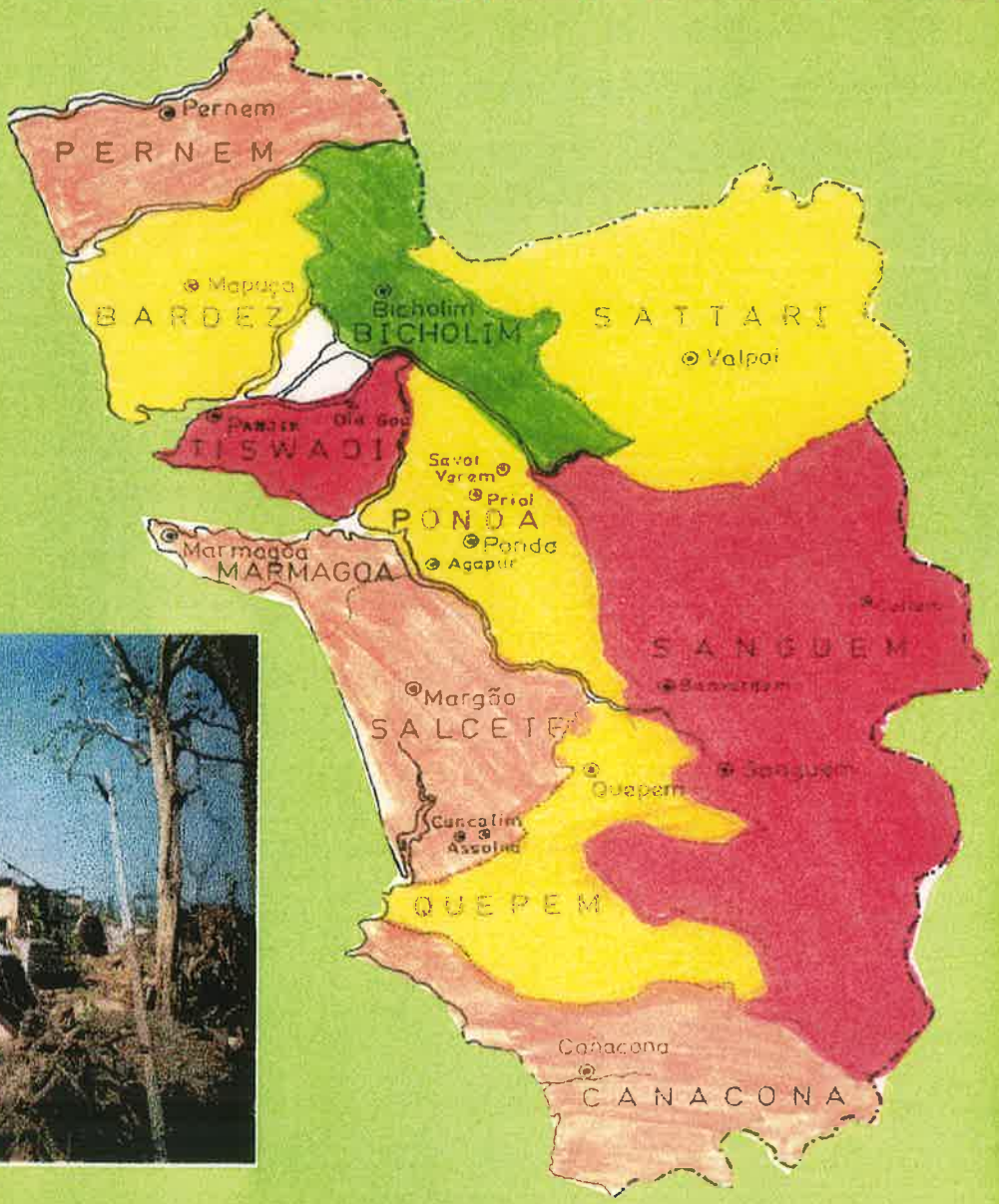
DISASTER MANAGEMENT MECHANISM OF GOA : A CRITICAL APPRAISAL

DR. (MRS.) RAJESH SINGH



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(2000)

ACKNOWLEDGEMENTS

Disaster Management as an inevitable part of overall development process gained momentum after declaration of 1990's as the International decade of National Disaster Reduction (IDNDR). The Present study was undertaken as an effort to contribute to the same cause as one of the activity of National Centre for Disaster Management (NCDM). Accordingly the proposal was submitted to Advisory Committee of NCDM for approval.

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Dr. (Mrs.) Rajesh Singh

CHAPTER - I

INTRODUCTION

1. NATURAL DISASTER SCENARIO

India is one of the most disaster prone country in the World due to its sub-continental dimension, geographical situation and the behaviour of the Monsoon. The country is exposed to various natural disasters like Drought, Floods, Landslides, Earthquake, etc. year after year. The impact of these disasters is invariably a great deal of loss to life and property. Hence `Disaster Management in general has become an inevitable part of the overall development process and has gained momentum by the Declaration of United Nations, the Decade of 1990s as the International Decade for Natural Disaster Reduction(IDNDR). It has been seen that all the States and the Union Territories in the country face one or more combinations of various disaster situations. This has drawn the attention of the government and also the awareness of the masses towards recurrent disasters and resulting concomitant loses to the society. This makes imperative for the government to put

greater thrust on the study of disaster management mechanisms in different States so as to strengthen the administration for effective coping of natural disasters. Keeping the above considerations the present research project was undertaken by - National Center of Disaster Management of Indian Institute of Public Administration, New Delhi. An attempt has been made to access the `Disaster management in the `State of Goa' with the sincere intention of identifying the critical areas of improvement.

Goa is not a major disaster prone State, but face minor disasters like Lightening, Heavy rain with Cyclonic winds and Floods in some parts during Monsoon season resulting in minor damages such as breaches in Protective Bunds, House collapse and Crop failures. These disasters may take place due to the vagaries of monsoon and the unstable condition in the Arabian sea.

2. OBJECTIVE AND SCOPE OF STUDY

In India, from the British days and also before that there existed a contingency plan of action for disaster management in terms of `Famine Code'. This code was modified by different State

Governments to suit their requirements. Goa being under Portuguese rule upto 1960, it remained a Union Territory upto 1987. Thus `Disaster management plan' for this State was not the same like the other parts of the country. Being less prone the `Disaster Management' occupied a back seat. However in civil administration it gained little momentum after becoming a full fledged State. Hence, its progressive status presents an ideal case about greater awareness of administrators in managing disasters resulting in incremental changes in its management. Therefore, the study of disaster management mechanism of Goa is of academic and administrative importance.

Cultural values, beliefs of Goan's are worth mentioning. They hold high religious values and nurture strong belief that no disaster can strike Goa " Almighty is the Saviour of the mankind" hold true for officials too. Performing regular Puja for the protection of the village from evil spirits is customary pattern of behaviour. They depend more on the grace and kindness of God for their survival in face of a disaster. This supernatural belief of the people including officials coupled with less frequency of natural disasters has made people of Goa complacent with the

status quo. This makes further imperative to study the status of Disaster management mechanism in the State of Goa.

3. METHODOLOGY OF THE STUDY

Survey Research method was used to study the problem. Data was collected both through primary and secondary sources. The personal interviews were used to collect the data. The sample consisted of State Government officials from different departments managing the disasters and people's representative at State, District, Sub-division, Panchayat and community. The inter-disciplinary, integrative and holistic approach was applied to study the disaster management mechanism.

CHAPTER - II

GOA AT A GLANCE

1. HISTORICAL PERSPECTIVE

Goa is a gift to the nation and to the world for it breath-taking scenic beauty, dark lush green mountains, and unending green foliage from North to South and East to West. Historical heritage, extended warm hospitality of the people attract tourist to make it a premier tourist destination in the country.

History of Goa has been traced back to the Satvahana Empire. It was a part of Vijayanagar Empire for about a century and later was taken over by the Bahamani King and Adilshah of Bijapur. Portuguese forces under Afonsode Albuquerque invaded Goa and ended the Adilshah rule on November 25, 1510. At that time the capital of Goa was "Velha Goa" presently known as "Old Goa". However, it was abandoned in 1738 after a plague epidemic had wiped out its population and capital was shifted to "Nova Goa" or "New Goa" present day named as Panaji. AdilKhan's Palace became the seat of the Government. From 1961 to 1987 Goa was part of an Union Territory comprising of Goa, Daman

and Diu and was elevated to the Status of a State as 25th State in the Indian Union on May 30, 1987.[1]

2. *GEOGRAPHICAL LOCATION AND BOUNDARIES*

Goa is situated between the West Coast and Western Ghats of the Indian Sub Continent. The State of Goa lies between 14 degrees 53 minutes and 15 degrees 48 minutes North latitude and between 73 degrees 45 minutes and 74 degrees 24 minutes East latitude. It has a coastline of about 100 kms and is triangular in shape. It is surrounded by Maharashtra in the North, Karnataka in the East and the South and the Arabian Sea in the West. Its boundaries are defined by Terekhol river which separates it in the north from Savantwadi in Maharashtra, the Sahyadri Ghats in the east and the north Canara in Karnataka state in the south. It has an area of 3,701 sq. Kms. and its maximum length and breadth is 105 Km. and 60 km. respectively.

3. *TOPOGRAPHY*

The topography of the land presents three well defined parts -hills, plains and sea-coast. Its distinghishing feature is the Sahyadri mountains which presents a continuous mountain warrier over a considerable part of the north-eastern and south eastern

border and thereafter branch off westwards across the territory into numerous spurs and ridges. These dark green peaks provide a superb backdrop to the fields and meadows sloping gently to the blue expanse of the Arabian Sea in the west.

The general configuration of the land points out a gradual slope from the Western Ghats towards the Sea-Coast.

The territory is intersected by numerous rivers, which are generally navigable. As the country slopes gradually towards the sea, these rivers also flow westwards and discharge their waters into the Arabian Sea.

Goa also possesses the finest natural harbour of India. This is formed by the promontories of Bardez and Marmagoa. Half way between these extremities lies the Cape(Cargo) projecting from the island of Goa divides the harbour into anchorages known as Aguada and Marmagoa. Both the harbours are capable of accomodating safely the largest shipping from September to May.

4. CLIMATE AND RAINFALL

Goa has warm and humid tropical climate and its annual average temperature is 26^0C. It has three broad seasons, the cold (dry) season, the warm or hot season and the rainy season. Rainy

season begins from June and continue till September. Goa receives rain from the South-West monsoon. The average rainfall is of 305 cm. a year. Occasional thunder showers are also experienced in May and October.

5. *SOILS*

About 81% of the soil of Goa is Lateritic in nature and 11% located along the sea-coast and estuaries is sandy to sandy loams and remaining 8% of the soil is alluvial in nature.(2)

6. *ALTITUDE*

The land elevation of Goa ranges from Sea-level to 1,022 meters. The Wagheri Hills in Sattari Taluka is the highest point.

Land along the estuaries (rivers with sea water in their lower reaches: a wide tidal mouth of a river) is below sea-level and is protected by bunds or dykes and sluice gates.(3)

7. *LAND UTILISATION*

The State of Goa has a total geographical area of 3702 sq. kms out of which 3611 sq. km. area is land. The forest cover is 1424 sq. km. accounting for 38.5% of the land area.(4)

8. *COMMUNICATION AND TRANSPORT*

Communication in Goa is through Landways, Waterways, Railways and Airways. Various rivers scan the entire territory making it possible to travel to almost any part of Goa by means of Inland Water transport. Goa is well connected with telegraphic and postal services.

9. *POPULATION PROFILE AND SOCIO-CULTURAL MILEU*

According to 1991 Population Census, the population of Goa is 11,69, 793. Out of which 5.95 lakhs are males and 5.75 lakhs are females. Nearly 70% of Goa's population depends on agriculture. The Decadal growth rate (1981-91) was 16.08%. Rural Urban composition was 6.90 lakhs and 4.80 lakhs respectively. Literacy rates (population aged 7 years and above) for the total population and male and female population were 75.51%, 83.64% and 67.09% respectively.

Goa has a rich Cultural heritage reflected through their religious Values, Attitudes and creative interests. Religious beliefs are well demonstrated through creations, Music, Dance & Dramatic performances from the time immemorial. The people of Goa are gracious, polite, friendly, dependable and loyal to their

masters. Personality and living styles are highly influenced by Portuguese culture and represents a happy blend of tranditional life styles of Western India and south west Eurpoe. The majority of the Goans are Hindus and about 40% of them are Christians. The long period of rule by the Portuguese have left a deep mark of European culture on the entire society of Goa. They enjoy great affinity so much so that people celebrate most of the Christian's fair and festivals and ceremonies without any consideration of religion or caste. The mix of the Hindu and Christian traditions is also reflected in the people behaviour in terms of costume, hair styles, food habits and inter-personal relations. The orthodox Hindu traditions are cherished but they have been refined in view of prevailing European customs and conventions. The Goan society is the most westernised sub component of overall Indian Society. The society at large reflects the value, beliefs, faith and mores which are Indian in essence but having demonstrably Portuguese influence upto the inner core. Outside influences have not affected their ways of thinking and hence no appreciable change in their thinking and style of behaviour is demonstrated in

day to day life. The value system has provided a deep cover to Goans. Existing traditions are very important for them hence take very long time to accept the unavoidable changes. This change is also found to be superficial. It neither affect their ideology nor changes the basic components of their simple living in a big way.

REFERENCES

1. Agriculture in Goa: At a Glance, Directorate of Agriculture, Goa 1995 p.3.

2. ibid, P.9.

3. ibid, P.9.

4. Annual Administration report of the Government of Goa, 1993-94, p.1

GLOSSARY

Latitude

The angular distance north to south from the equator of a point on the earth's surface, measured on the meridian of the point.

Longitude

Angular distance east or west on the earth's surface, measured by the angle contained between the meridian of a particular place and some prime meridian as that of Greenwich, England or by the corresponding difference in time.

Topography

The detailed description and analysis of the features of a relatively small area, district or locality.

Promontory

A high point of land or rock projecting into the sea or other water beyond the line of coast: a headland.

Estuary

That part of the mouth or lower course of a river in which its current meets the sea's tides, and subject to their effects.

Decadal growth rate

Decadal growth rate is the actual increase (final year population of the year from which we are calculating) in the population, divided by the population of the final year. To get a percentage we have to multiply it by 100.

CHAPTER - III

CONCEPTUAL FRAMEWORK

Contents

1. Definitions of Disasters
2. Types of Disasters
3. Disaster Management Process
   - A Prevention
   - B Mitigation
   - C Preparedness
   - D Response
   - E Recovery
   - F Development
4. Other concepts/processes essential for Disaster Management
   - (a) Vulnerability
   - (b) Hazard
   - (c) Risk
   - (d) Warning
   - (e) Threat
   - (f) Precaution

1. *DEFINITIONS OF DISASTER*

Disaster is defined as sudden or great misfortune, calamity (Oxford dictionary). It is also described as a sudden calamitous event producing great material damage, loss and distress (Webster's dictionary). According to International Red Cross, Disaster is catastrophic situation in which day-to-day patterns of life are in many circumstances suddenly disrupted and as a result people need protection, food, clothing, shelter, medical and social care and other necessities of life (International Red Cross, Humanitarian Agency).

World Food Programme (International Aid Agency) has defined it as an urgent situation in which there is clear evidence that an event has occurred which causes suffering or loss of livestock and which government concerned has not the means to remedy furthermore. It is a demonstrably abnormal event which produces dislocation in the life of a community on exceptional scale (World Food Programme, International Aid Agency).

Disaster as an event, natural or man-made, the impact of which is such that the affected society undergoes marked

disruption, Coping mechanism are strained and exceptional measures are required for response (Carter, 1990).

According to `WHO' disaster is "Any occurrence that cause damage, economic disruption, loss of human life and deterioration in health and health services on a scale sufficient to warrant an extraordinary response from outside the affected community or areas (World Health Organisation).

2. *TYPES OF DISASTERS*

Disasters are often classified according to their nature of occurrence such as : sudden or slow, or according to their cause, natural or man-made etc.

2. A. Natural Disaster

Natural Disaster is natural phenomenon which is normally caused by natural events. It includes disaster such as Cyclones, Earthquakes, Floods, Drought, Famine, Landslides etc.

2. B. Man - made Disasters

Man-made disaster is aggravated by human interference, i.e.. It is a process rather than a sudden acts of God (Turner and Pidgeon, 1997).

Man-made disasters are again of several types, such as:

(i) Technological Disaster: Technological disaster which is normally caused by a technological failure and which includes transportation accidents, industrial explosions and toxic chemical releases (O'Riordan, 1993, 1994, p.413).

(ii) Planned Disaster: Planned disaster is caused by deliberate destructive human acts such as Bombings, Arson and Riots.

Besides the earlier classification, the disasters are also classified, such as:

(a) Third World Disaster

(b) Developed World Disaster

(a) Third World Disaster: It is usually associated with natural causes (Earthquake, Drought, Flooding) and victims whose vulnerability is often linked to poverty and a lack of resources locally to mount an effective response to disaster (Ibid., p.413).

(b) Developed World Disasters: These are usually associated with more complex causes and victims who are more demanding. Planning for Developed World Disaster is usually more effective

due to presence of adequate resources to mount an effective response.

3. *DISASTER MANAGEMENT CYCLE*

Disaster Management Cycle involves the following sequential activities.

3.A. Prevention

Prevention may be described as a means designed to prevent the natural phenomena from causing or resulting in disaster. (Naidu, 1989, p. 23). Prevention covers those measures which are aimed at impeding the occurrence of a disaster event or preventing such an occurrence having harmful effects on communities (Carter, 1991, p. 203).

3. B. Mitigation

Mitigation is the task of actions that reduce the harmful effects of a disaster (Naidu, 1989, p. 278). Mitigation accepts the occurrence of extreme natural phenomena but attempts to minimise both human and property loss. Mitigation involves measures aimed at reducing the impact of a natural or man-made

disaster on a nation or community (Carter 1991, p. 209). It more generally implies that whilst it may be possible to prevent some disaster effects, other effects will persist but can be modified or reduced provided appropriate actions are taken.

Mitigation applies to a wide range of activities and protection measures that might be initiated from the physical, like constructing stronger buildings to the procedural like standard techniques for incorporating hazard assessment in land-use planning. It includes both preparedness and protection of physical infrastructure and economic assets. Mitigation is generally considered to comprise two separate types of activities.

3.B(i). Structural Mitigation

Like Dams, Windbreaks, Terracing,Hazard resistant buildings.

3.B(ii) Non-Structural Mitigation

Action within this segment usually takes the form of specific programmes intended to reduce the effects of disaster on a nation or community. These are followings:

- Land-use regulations
- Safety regulations relating to high-rise buildings, Control of hazardous substances etc.

- Safety codes governing land, sea and air transport systems.
- Agricultural programmes aimed at reducing the effects of hazards on Crops
- Systems to protect key installations such as Power supplies and vital communications
- Enforcement of Building Codes
- Developments in infrastructure such as the routing of new high-ways away from disaster prone areas.

C. *PREPAREDNESS*

Disaster preparedness is described as measures to organise and facilitate timely and effective Rescue, Relief and Rehabilitation in cases of disaster. It is defined as the "measures which enable Government, Organisations, Communities and Individuals to respond rapidly and effectively to disaster situations" (Carter, 1991, p.225).

Preparedness Measures

According to Carter (1991, pp. 55-56), preparedness measures includes the following:

- The formulation and maintenance of valid upto-date counter disaster plan which can be brought into effect whenever required.
- The provision of warning system.
- Special provision of emergency action, such as Evacuation of population to safe places.
- Emergency communications.
- Public education and awareness.
- Training programmes including exercises and tests.

Preparedness as the word suggests entails applying in advance all possible corrective measures such as:

- Reinforcing unsafe building that might collapse during an earthquake.
- Land-use and Construction practices to avoid hazards.
- Emergency-response plans.
- An awareness programme to educate the people on the nature of threat.

Preparedness plan should include arrangements for periodical checking that is to keep upto-date and fully viable for the purposes for which it is designed.

D. *RESPONSE*

It is defined as a `Response measures' taken immediately prior to and following disaster. Such measures are directed towards saving life and protecting property and in dealing with the immediate damage caused by the disaster (Carter, 1991, p.245).

D.(i). Salient Features

- The scope of response is usually extensive.
- Response operations usually have to be carried out under disruptive and sometimes traumatic conditions.
- Response action usually deals with urgent problems created by disasters which needs immediate redressal.
- Response action is often taken without considerating long term repercussions.
- Success depends vitally on good preparedness.

Response measures includes some of the following activities:

- Implementation of plan.
- Activation of the counter-disaster system.

- Evacuation measures.
- Search and rescue.
- Provision of emergency Food, Shelter, Medical assistance etc.
- Survey and assessment of lossed.

D.(ii) Rescue

It is the first activity normally conducted following a disaster. The basic interest of `Rescue' is to locate disaster victims and to ensure their physical safety (Naidu, 1989, p. 279)

- It includes locating victims trapped in collapsed structures.
- Removing victims from perilous locations.
- Evacuating families or even whole communities from areas subjected to secondary effects of disasters.

D. (iii). RELIEF

Relief programmes are those intended to provide relief to the disaster victims (Naidu, 1989, p. 279). Relief programmes include provision of food, drinking water, medicines, clothing, foodgrains, utensils, shelter, payment of Ex-gratia, gratuitous relief, remissions etc. (Ibid., p.279) It is a primary responsibility of the state to organise relief measures for people affected by natural disasters, but if the seriousness of the disaster calls for

relief measures and consequent expenditure beyond the means of a State in a particular year, the State Government calls upon the Central Government for financial assistance.

E. RECOVERY

Recovery is the process by which communities and the nation are assisted in returning to their proper level of functioning following a disaster (Carter, 1991, p. 293).

Recovery is a long term process which takes 5-10 years or even more. Recovery is usually taken as including aspects such as Restoration, Rehabilitation and Reconstruction. Recovery includes following various activities:

- Restoration of essential services.
- Restoration of repairable homes and other buildings/installations.
- Provisions of temporary housing.
- Measures to assist the physical and psychological rehabilitation of persons who have suffered from the effects of disaster.
- Long-term measures of reconstruction including the replacement of buildings and infrastructure which have been destroyed by the disaster.

- Rehabilitation involves operations and decisions taken after a disaster with a view to restore a stricken community to its former living conditions while encouraging and facilitating the necessary adjustments to the changes caused by the disaster.

F. DEVELOPMENT

Development provides the link between disaster related activities and national development. According to Carter, Development is intended to ensure that the results of disaster are effectively reflected in future policies in the interests of national progress. Carter again highlighted that it can produce the best possible benefits by performing following activities:

- Introducing improved and modernised buildings, Systems and Programmes.
- Utilising International disaster assistance to optimum effect.
- Applying disaster experience in future research and development programmes.

preparedness to combat a crisis. It is also a process of monitoring situation in communities or areas known to be vulnerable.

4.D (iii) Emergency Warning

Emergency warning indicates certainty of a crisis and provides signal to start full action for protection from a disaster.

4.D.(iv) Threat

The time or period when a hazard has been identified and is assessed as threatening a particular area (Carter, 1991, p.56).

4.D(v) Precaution

Action taken after receipt of warning to offset effects of disaster impact (Carter, p.56). Such action might include:

- Closing offices, schools etc.
- Bringing emergency power generators to readiness.
- Cutting crops to avoid total loss from high winds and heavy rains.
- Making available safe boats and vehicles.
- Taking household precautions such as storing emergency water supply.

CHAPTER -IV

DISASTER MANAGEMENT MECHANISM IN GOA

1. ADMINISTRATIVE STRUCTURE/DIVISIONS OF THE STATE

In the federal set-up of India, `Disaster Management' is essentially the responsibility of the concerned State Government usually the Revenue Department or the Relief Department. The role of Central Government with its resources is supportive and provide the needed help and assistance to State Administration in augmenting relief efforts in the wake of major natural disasters. The response of Central Government is determined on the basis of keeping in view various factors like the gravity of natural disaster, the scale of necessary relief operation, the requirements of central assistance for augmenting the financial resources at the disposal of the State Government and in accordance with the existing policy of financing the relief expenditure (Tenth Finance Commission).

State of Goa is divided into two districts, Seven sub-divisions and Eleven administrative Talukas for effective functioning of the administration and prompt redressal of citizen grievances (as shown in

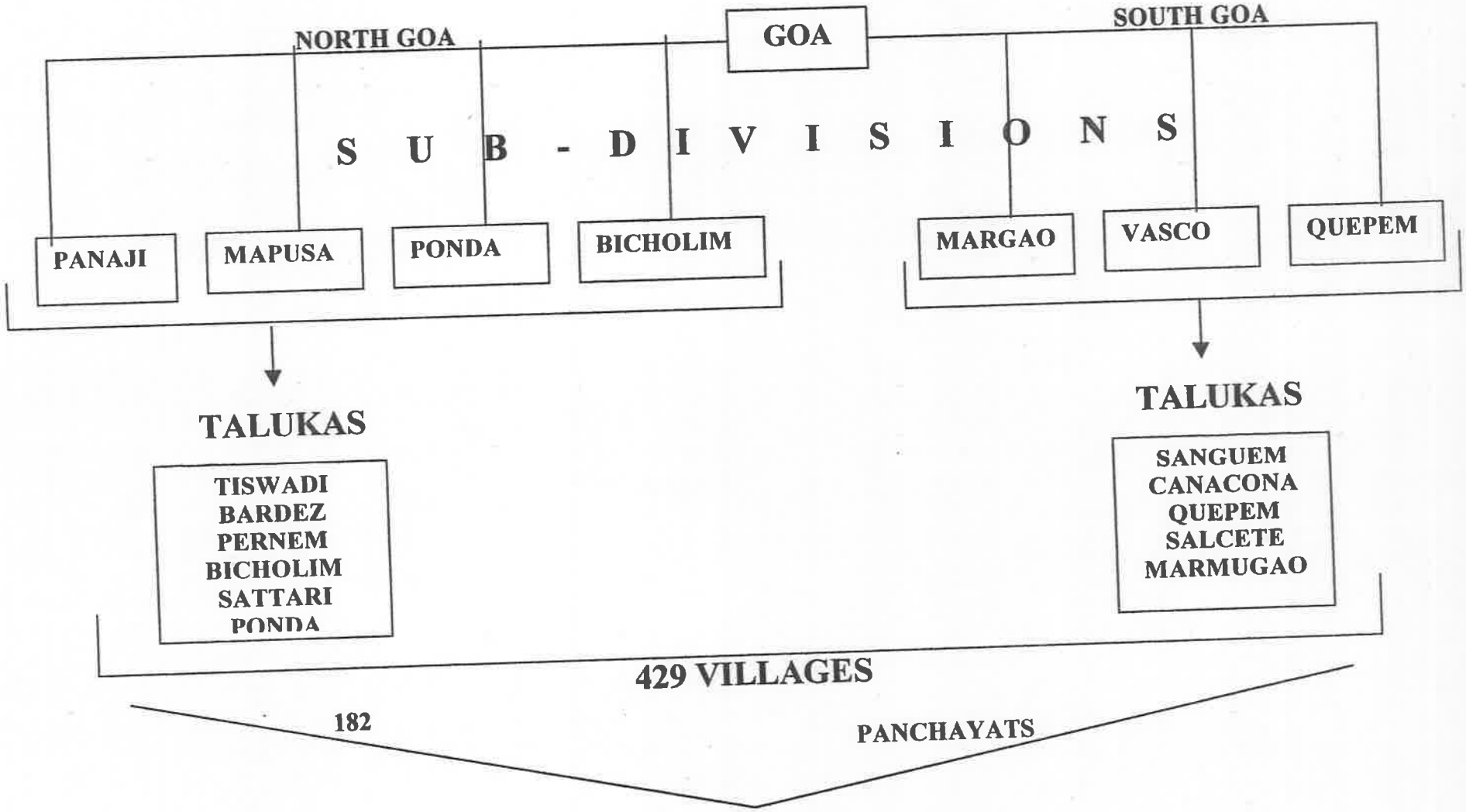
figure -1). There are 429 revenue villages in Goa organised into 182 Panchayats. North district comprises of Tiswadi, Bardez, Pernem, Bicholim, Sattari and Ponda Talukas and South District comprises of Sanguem, Canacona, Quepem, Salcete and Marmugoa talukas (as shown in figure - 2). The main cities are Panjim, Margao, Mapusa, Vasco-da-gama and Ponda. Naval and Army installations are located in Vasco, Panjim, Margao, Bambolim and Ponda.

The head of a Sub-division is called the sub-division officer (SDO) and head of Taluka is called as Mamlatdar. Contact with the each village is through the village level officer Talathi (Patwari) each incharge of one or more village (as shown in figure - 1).

2. *DISASTER MANAGEMNT AT STATE LEVEL: ORGANISTION STRUCTURE*

There is no specific disaster management division in Goa administration. Goa is less prone to natural disasters, the task is treated as less important, adhoc, seasonal activity during May to September. The department of Civil administration takes on the charge of management of natural disasters. The data from the records and from personal interviews with concerned officials reveals the following major task

FIGURE - 1



ADMINISTRATIVE STRUCTURE OF GOA

groups apart from civil administration for management of disasters at State level.

2. A. Disaster Management Task Group

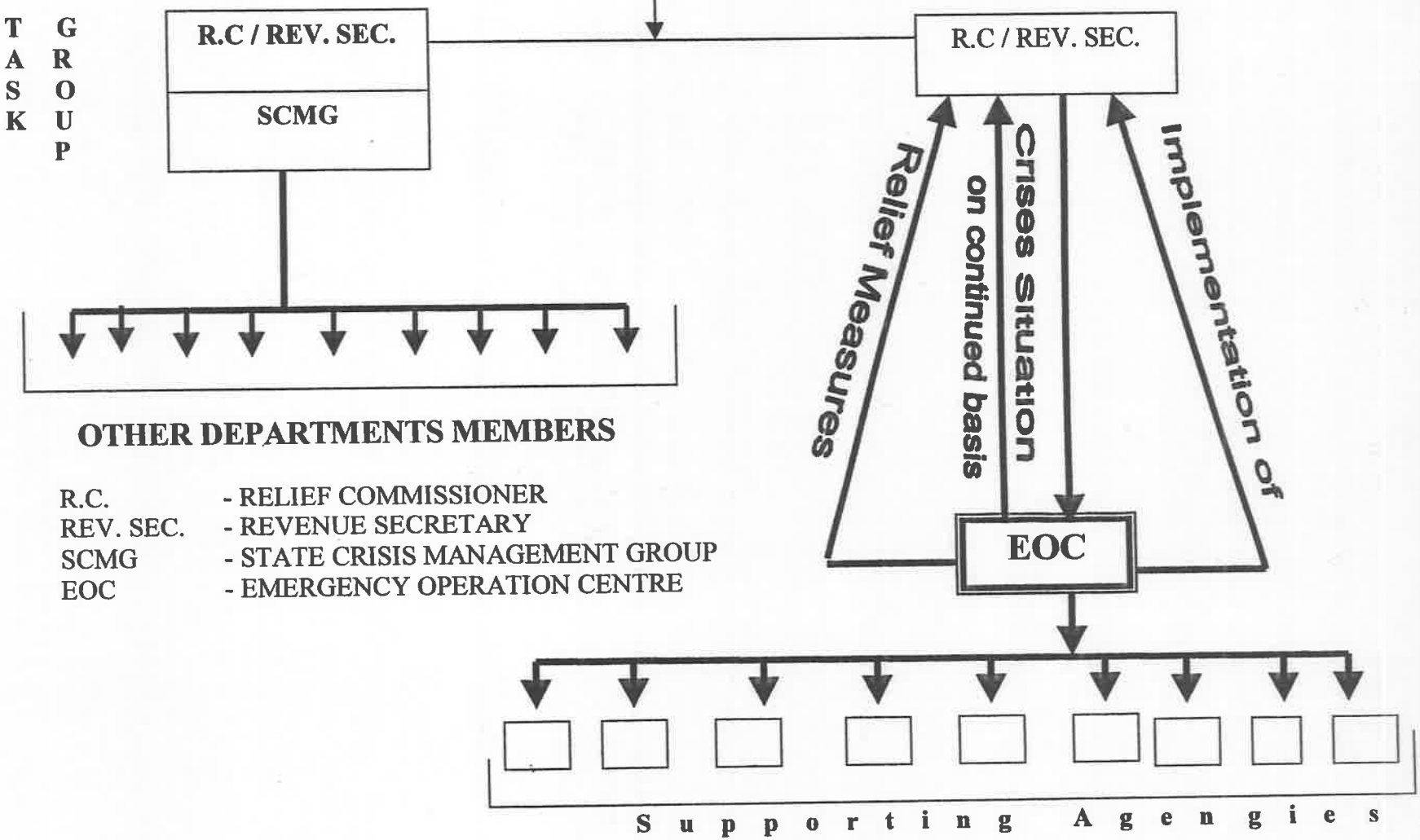
1. State Crisis Management Group

It has been reported that there exist a State Crisis Management Group (SCMG) under the Chairmanship of Relief Commissioner/Chief Secretary (also mentioned in the contingency plan). It is a controlling body as shown in figure - 2. This group comprises of senior officers from the departments of Revenue/Relief, Home, Civil Supplies, Power, Irrigation, Water Supply, Agriculture, Forests, Rural Development, Health Planning, Public Works, Finance and Panchayat (Local Self government).

The Chief Secretary/Relief commissioner may also coopt on the group depending upon the requirement of the situations one or more of the following persons:

1. Sub-Area Commander/Station Commander.
2. Station Commander of Air Force.
3. Flag Officer Commander-in-Chief.
4. Chairman/Secretary, Indian Red Cross, State Branch.

FIGURE - 2



DISASTER MANAGEMNT - ORGANISATION STURCTURE AT STATE LEVEL

5. Representative of Meteorological Department, Officer-in-charge of Cyclone warning centre, Centre Water Commission and Flood Forecasting Organisations.
6. General Manager from Railways of the concerned zone.
7. General Manager, Telephones.
8. Chief General Manager, Telecommunications.
9. D.G. of State Police.
10. Chief Engineer, Roads and Buildings.
11. Chief Engineer, Irrigation.
12. Chief Engineer, Panchayati Raj.
13. Chief Engineer, Urban Water Supply.
14. Chief Engineer, Rural Water Supply.
15. Director of Agriculture.
16. Director of Horticulture.
17. Director of Medical Health Services.
18. Director of Animal Husbandry.
19. Secretary of the State Electricity Board.
20. Secretary, Department of Women & Child Development.
21. Station Director AIR/Doordarshan.
22. Chief Engineer, Boarder Road Organisation.

23. Director, Civil Supplies.

24. Regional Manager, Indian Oil Corporation.

25. Director, Local Bodies.

This is also referred as State level Committee.

2. *Emergency Operation Centre (EOC)*

Revenue Secretary is the administrative head, overall incharge of all activities related to management of natural disasters. The Revenue Secretary establishes Emergency Operation Centre (State Level Control Room) as soon as a disaster situation developes (as shown in figure - 2).

The Control Room will be responsible for:-

- Transmitting to the Central Relief Commissioner information as to the development of a crisis situation as a result of natural disaster on continued basis till the situation improves.
- Receiving instructions and communicating to appropriate agencies for immediate action.
- Collection and submission of information relating to implementation of relief measure to the Central Relief Commissioner.

- Keeping the state level authorities apprised of the developments on a continuing basis.

3. *DISASTER MANAGEMENT AT DISTRICT LEVEL: ORGANISTION STRUCTURE*

3. A. District Relief Committee: Task group

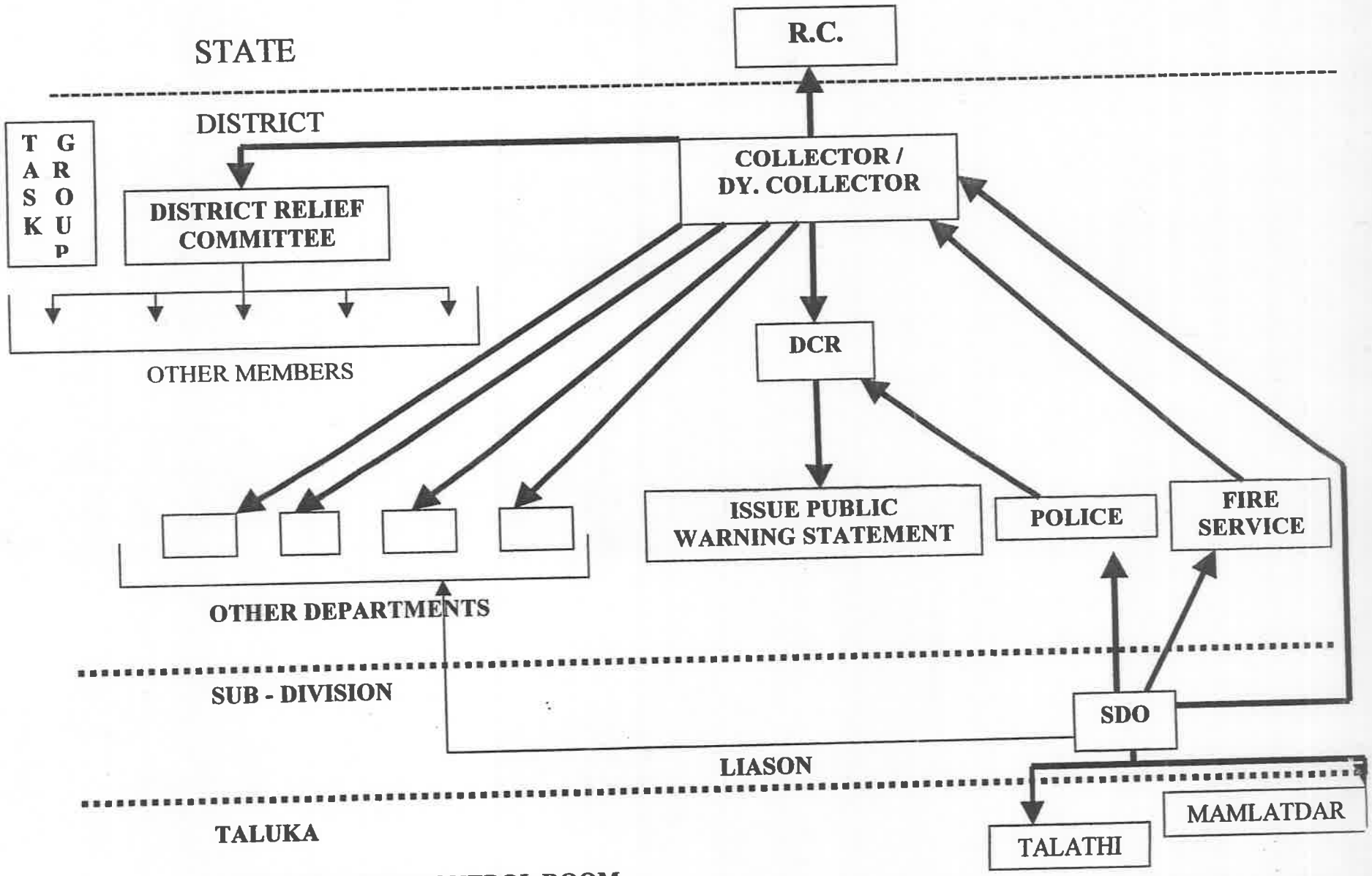
The District level relief committee functions under the chairmanship of Collector and consists of official and non-official members including local legislators and member of Parliament. They review the relief measures which is undertaken by the district of Goa (as shown in figure - 3).

3. B. Key Actors-roles and Responsibilities

3.B. 1. Collector/Deputy Collector

Civil administration is the overall incharge of management of natural disasters at district level. All the powers for management of the disasters are delegated to collector of respective district North and South Goa. The Collector and Deputy Collector are the focal role persons at the district and field level activities.

FIGURE - 3



DISASTER MANAGEMENT ORGANIZATION STRUCTURE AT DISTRICT LEVEL

Nature of Tasks:

(i). Planning

- The collector through its subordinate offices would collect the information well in advance about the respective sites where there is possibility of having floods, landslides etc. in the rainy season and where preventive action is required to be taken.
- Preparation of contingency plan.
- Day to day work related to administering relief.

(ii). Directing

- Implementing contingency plans for disaster mitigation at the field level.

(iii). Supervision and Coordination

- The Collector exercises coordinating and supervisory powers over functionaries of all the departments at the District level.

(iv). Post Disaster Activities:

- Receive the information submitted by the police, the Mamlatdar and the Sub-Division Officer (SDO) on the event of disaster.
- Issue Public Warning Statement.

- Identify other Disaster managing organisations. The organisations managing disaster situation are identified after holding meeting of all Taluka level and District level Officers by the District Collector. It includes revenue officials, police authorities, fire services and NGOs.
- Maintaining close liaison with many Central government machinery within the district like Army, Navy to supplement the efforts of district authorities in Rescue and Relief operations.
- The District Collector can take the help of local army also.
- Sanctioning and ensuring relief to the affected persons and send such proposals to the Government expeditiously whenever government approval is required.
- Issue instructions to all the chief officers to make adequate arrangements to meet any eventuality to prevent floods during monsoon.
- Issue instruction to municipal authorities to clear roads and gutters in the city.
- Issue instructions to Forest and zonal agriculture officers regarding cutting of branches of trees to be attended on priority basis in case of any complaint.

- Issue instructions to the police to keep in touch with the Goa Shipyard Ltd. M.P.T. etc. for its availability, if required.
- Issue instructions to the Executive Engineer in charge of P.W.D. division to keep maximum number of labourers reserved for clearing road blockages by removing fallen trees on roads, clearing mud of landslide if occured due to disasters alongwith the equipments and trucks.
- Issue instructions to his sub-divisions to operate on Saturday and Sunday their officers till the monsoon is over.
- To prepare a list of nodal officers and next level officers with their telephone contact Nos. to be circulated to all the Village Panchayats(V.P's) and Municipalities to whom in emergency, public can contact and to those who will be responsible for the rescue operations.

In the eventuality due to the on set of monsoon accompanied by torrential rains and cyclonic winds which may disrupt normal life causing extensive damages to lives and properties, the district administration needs to be geared up fully to meet any such circumstances efficiently and effectively so that precious lives and

properties are saved and the agony and sufferings of the victims minimised.

The various measures undertaken by the district administration of Goa are as follows:

(v). Preparation of Contingency Plan

A Contingency Action Plan for the district of Goa for different natural disasters like Cyclones, Floods, Drought, Earthquakes is released by the Collector and is also approved by the State Government discussed later.

What it is all about ?

- This contingency plan lay down specific action points related to action after the receipt of the first warning, action after the receipt of the second warning, post measures instructions to the public, various steps which is to be taken, planning, preparation and identification of problems, mobilisation of resources, Command and control, key personnel and contact points relating to all aspects.

The Collector also co-ordinates and secure the input from the local defence force unit in preparation of contingency plan. The various other departments are primarily involved in providing

relief to the affected persons like P.W.D., irrigation, Municipalities/Village Panchayats, Health Department, Fire Brigade, Police, Captain of Ports, Electricity, Transport, Civil Supplies. This disaster relief plans provide for specific tasks and agencies for their implementation in respect of areas in relation to different types of disasters.

(vi). District Control Room and its Operation :

The control room is set up in the collectorate in each district for day to day monitoring of the rescue and relief operations on a continuous basis. It works round the clock from April to November to deal with the crisis situation under the headship of collector or Deputy collector..

In an event of disaster the Control room with its above mentioned activities immediately starts functioning in a manner planned earlier with telephone Nos. of collector, North and South - Goa, with a police wireless set and a transistor receiver. All messages and orders for immediate action are issued from this control room manned by the Duty Officer round the clock. The State level committee also hold its emergency meeting inthe control room.

3. B.2. Sub-Divisional Officer (S.D.O.): Key Role Player at Sub-division Level

On receipt of information during crisis situation, SDO has to keep contact with the Police, Fires services, NGOs Sarpanch, of village, Mamlatdar and Talathis, thereafter in consultation with the collector decide the further course of actions (as shown in figure - 3).

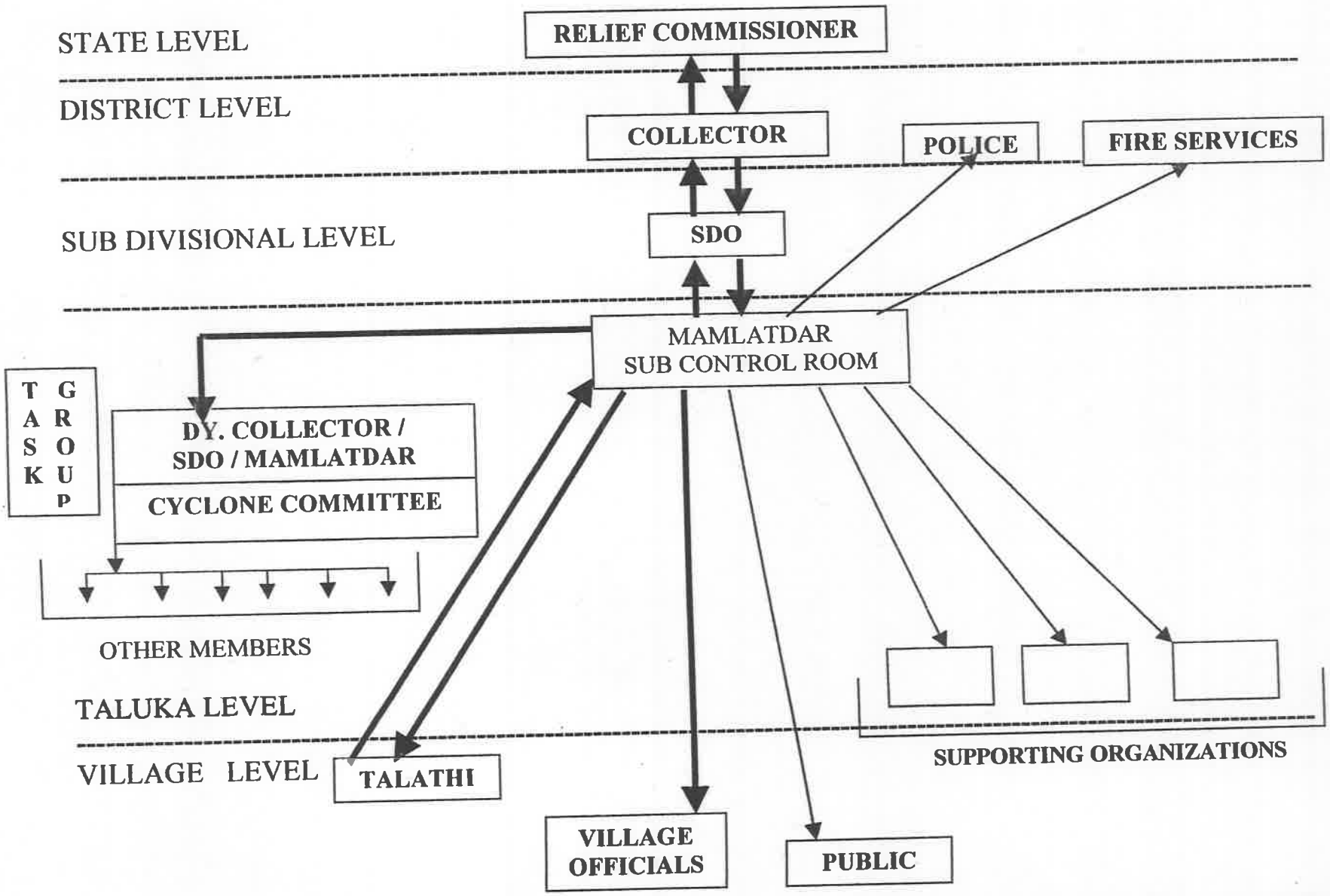
Also keeps contact with and also takes the help of police in case of breakdown of the telephone system.

4. DISASTER MANAGEMENT AT TALUKA LEVEL: ORGANISTION STRUCTURE

4.A. Cyclone Committee: Task group

There exist a cyclone committee at the Taluka level under the chairmanship of the Dy. Collector/Sub-divisional officer in Taluka head Quarters where the office of the Deputy Collector/SDO is functioning and in other Talukas under the chairmanship of the respective

FIGURE - 4



DISASTER MANAGEMENT - ORGANIZATION STRUCTURE - AT TALUKA LEVEL

Mamlatdar (as shown in figure- 4). The Committee also includes members from the following departments:

- Health Services
- Public works department.
- Fire services.
- Electricity department.
- Police Department.
- Irrigation Department.
- Education Department.
- Chairman of Municipal Council.
- BDO of Talukas.
- One MLA and One Sarpanch.

4. B. Mamlatdar: The key Role Player at Taluka level

- On the receipt of information about the event of natural disasters Mamlatdar establishes contact with SDO, Police authorities, fire services, village level officials and NGOs.
- As per instruction received from higher authorities Mamlatdar makes the temporary arrangement to shift the affected victims to

nearby School buildings/Government buildings or any other convenient place in the nearby vicinity.

- Issue instructions to the Talathi to communicate to his office immediately by phone or wireless message in case of any disaster.
- Issue instructions through Talathi to the village panchayats, to the public as and when required.
- Constitute an emergency cell during this period where in the staff on duty remain present 24 hours, 7 days a week for receiving urgent messages from the village level and handle the situation on priority.
- The role of Mamlatdar changes during crisis situation. After receiving such crisis message, he personally visits such sites and handle the situation with all possible measures.
- Issue directive to all the `Devasthans' to provide assistance to the rescue teams in providing temporary shelters in their Agrasalas in emergency.
- Issue directions to wholesale dealer of kerosene that a minimum of 250 liters of kerosene shall be kept reserved always and the said reserved stock shall be utilised only on the direction of Mamlatdar

or official requisition of fire services in the event of failure of Electricity.

- The Assessment of damage is done immediately by the Mamlatdar. The proposal for financial assistance to the victims should reach the officer of Dy. Collector with in 24 hours irrespective of public holiday for onward submission to Government.
- The details of all the huts and houses in the villages are available in the electoral rolls with the mamlatdars. Almost all the houses are covered by the electoral rolls. At the time of necessity this list will be used by the Mamlatdar for contacting the people living in the affected area.
- Public is informed to take following measures when the cyclones actually hit the coast:-

- Keep the radio on, listen to the broadcast on the disaster. Pass on the information to others.
- Avoid being misled by the rumor mongers. Pass on only the authentic information listened on the radio.
- Get away from low lying beaches/areas to a higher ground.
- Evacuate promptly if asked to do so by the authorities.

- Bond up glass windows with wooden plants. If no wooden boards are available paste paper on the glasses.
- Store extra food especially which does not require cooking and also drinking water in covered vessels.

4. C. Sub-Control Room at Taluka Level

Sub control centres are also established at all Taluka Headquarters at Panaji, Mapusa, ponda, Quepem, Vasco-da-gama and Margao and function under the respective Sub Divisional magistrate/Mamlatdar. These sub control centres also works from April to November round the clock (as shown in figure - 4).

5. Functioning of State Level and Taluka level Committees

Both the State level and Taluka level committee shall be responsible for the following:

- To educate the public on natural disasters like Cyclones, flood and Earthquake.
- To make arrangements for Emergency action.
- To evacuate people whenever necessary.
- Rescue and Rehabilitation.

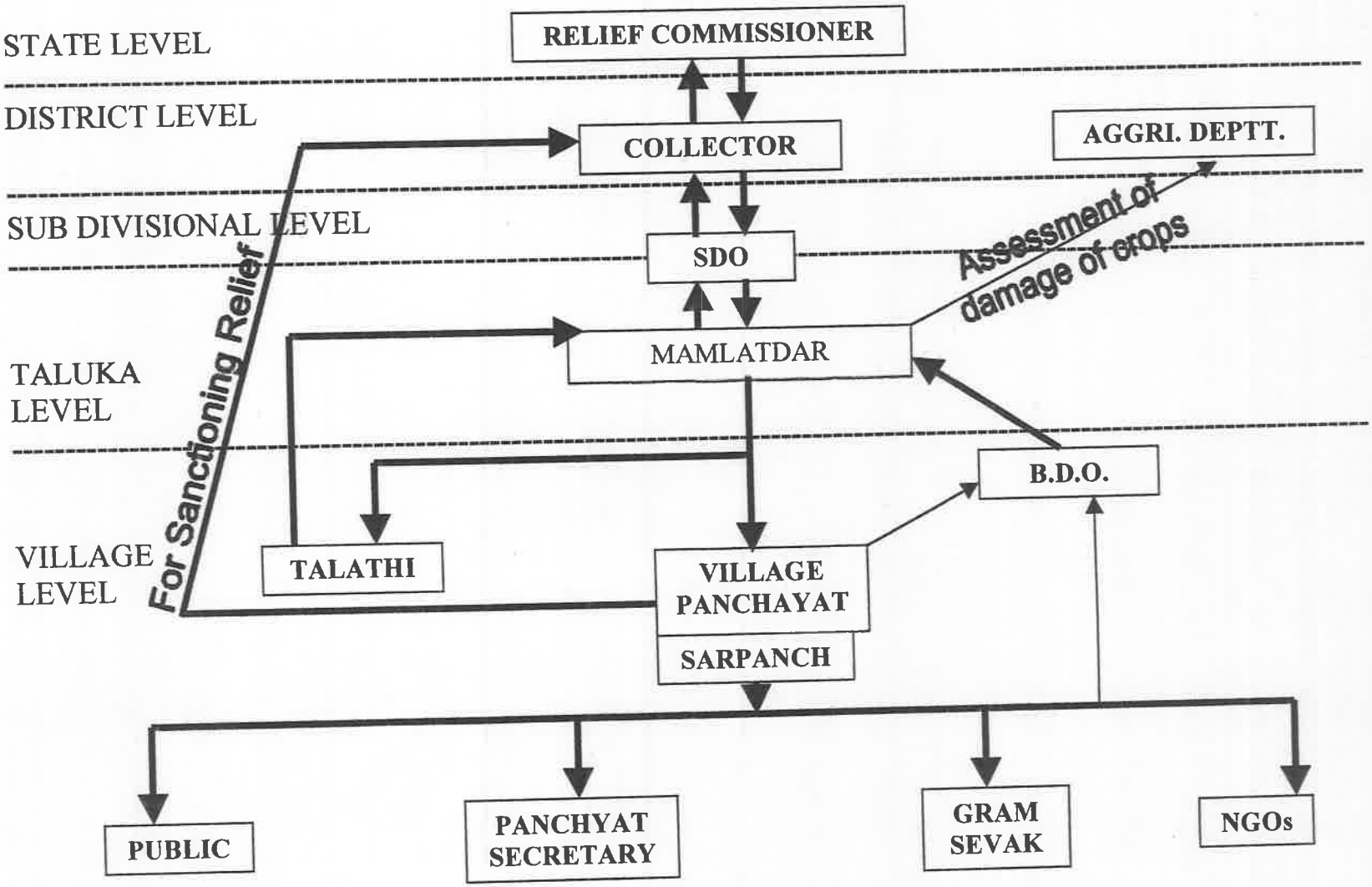
6. *DISASTER MANAGEMENT AT VILLAGE LEVEL*

6.A. Village Panchayat: The Key Actor

The Village Panchayat is formed according to the Revenue villages and population of village. The number of members in the Panchayat varies from 5 to 11 in different areas. Panchayat consists of Sarpanch, the executive head of Panchayat, Ward member Panchayat secretary (Nominee of some department in the panchayat), Village Talathi, Gram Sevak and members of different NGO's i.e. Lions club, sports club, Health club etc (as shown in figure - 5).

- Every year the Panchayat draws development plans and accordingly the works are executed either solely from Panchayat fund or through government under Grants-In-Aid.
- Though there is no specific disaster preparedness plan, however Panchayat makes some provision in the Panchayat budget to give financial aid and assistance to disaster victims under natural disasters especially in case of cyclone.

FIGURE - 5



DISASTER MANAGEMENT - ORGANIZATION STRUCTURE - AT VILLAGE LEVEL

- The Panchayat plays a key role in the event of disaster if casualties occur in village Panchayat area due to Cyclones/Floods. The Sarpanch the Ward member and Panchayat Secretary (A nominee of some department in Panchayat) draws panchnama evaluating the approximate loss of the property and accordingly the Panchayat sanction the amounts to the affected people. Similarly Panchayat refers the matter to the BDO and Collector for financial assistance from state level.
- In normal circumstances the Panchayat takes the help of Voluntary organisations such as Lion's club, Rotary club, Jesus, Sports club and Health club who organise Health camps' in the village. Panchayat also organises camps for women through Mahila Mandal in the village to educate the "DO" and "DONTS" in the disaster situation.
- Whenever any major casualties occur in the village the Panchayat reports the matter to the concerned department for necessary action. Panchayats do not have their trained staff and take the help from fire brigade, health authorities, Police department etc. to handle situations.

- The Panchayat convenes fortnightly meeting. The letters, circulars issued by Government to the Public are discussed to decide the action accordingly.
- Since BDO is a link officer to local Panchayat, the work is handled in cooperation with the Secretary of Panchayat and Gram Sevak at Panchayat level. Identification of the key organisation managing disaster situation at grass root level is done by the Panchayat and NGOs.

6. B. Talathi (Patwari)

The Talathi (Patwari) is an important functionary of revenue administration at the village level and plays a key role in management of natural disasters. Following are the duties/functions of the Talathi:

- Required to submit a report of occurance of natural disaster such as flood, fire epedemics of human beings and animals in the village of his jurisdiction. For example when paddy fields are flooded and had caused damage of crops, the Talathi immediately gives information to Mamlatdar and Mamlatdar forwards the report to Agriculture department for using compensation.

- Submits report to the Circle Inspector as well as to the Collector through the Mamlatdar about the occurance of harmful seed pests and disease.
- Required to have record of the crop and cultivation of the fields of his jurisdiction by giving general intimation to the public of that area seven days in advance.
- Required to intimate to the Mamlatdar immediately about the illegal inundation of saline water in the paddy fields.

6. C. Gram Sevak:

Gram sevak is a village level worker who has regular contact with the people of the village. He collects various information from the villagers by visiting the area and reports the matter to B.D.O. Following is the role of Gram Sevak:

- As a village level worker his role is to help in extension works in agriculture and related subject.
- To motivate villagers to use new methods of cultivation, use high yielding variety seeds and take up bio gas plants to bring more area under irrigation, Soil consumption, plant protection measures and Multiple cropping patterns.

- Convenes meeting with farmers to know their difficulties, problems and communicate to concerned authorities and help in solving them.
- The responsibility of Gram Sevak is basically to help the farmers in better production so as to improve their economic conditions.
- Has to carry the new message from house to house, motivate them, make them conscious of their own strength, inspire them, guide them and finally identify himself as a part of the village.

7. *OTHER SUPPORTING ACTORS: ROLES AND RESPONSIBILITIES*

The following Organisations also perform the supporting Roles in management of disasters.

1. P.W.D.

- To ensure that the roads are properly repaired before the onset of the monsoon.
- To ensure the availability of labourers at short notice if needed and provide with sufficient tools, one Truck/Tempo for easy and fast movement.

2. ***Irrigation Department***

- The department takes steps to clear the nallahs, river banks, beds, etc. so that the rain water does not over flow and enter into the residential areas before the disaster.

3. ***The Captain of Ports***

The captain of ports is given following roles:

- The department identifies the places where the occurrence of the floods during rainy season could be of major intensity and require evacuation of the people in case of emergency before Disaster.
- To issue immediate instructions to all sea going vessels, Trawlers, Barges, Boats etc for safe anchorage.
- Ensure that all the boats are securely tied and nets are stored in safe place.
- To ensure availability of sufficient ferry boats for rescue operation in river and sea.

4. ***Fisheries***

- Director of fisheries also issue warning to the fishermen about refraining them from going out for fishing.

5. ***Police Department***

- Key role player in disseminating the warning message.
- To evacuate the affected persons in floods from house collapse etc.
- Transportation of affected persons to safe places.
- To ensure that injured get timely medical assistance.
- To guard the property of the people in the affected area.
- Special attention is paid for prevention of thefts etc.

6. ***The Armed Forces (Army and Navy)***

These are the best organised and managed organisations of the country which provide all vital services during disaster situation. It helps civil administration in `Rescue' and `Relief' operations by providing prompt relief to the victims even in the most inaccessible and remote areas of the country. It covers all vital services such as restoring communication on streets and roads, supply of provision to stores, construction of temporary bridges, health and emergency medical services, transport, in rescue operations and support activities.

Generally the assistance of Army and Navy is sought only when Disaster is of high intensity and the civil administration

feels handicapped to handle the crisis situation. The same shall be requested by the state government of Goa as last resort.

Role of Armed Forces:

- Assistance in evacuation of people to safe places before and after the disaster.
- Restoring communication on streets and roads.
- Providing health and emergency medical services with the help of the full medical team including treatment at the nearest armed forces hospital.
- Establishing and running of Relief camps.
- Transporting of Relief material for the affected people.
- Construction and repair of roads and bridges.
- Repair, Maintenance and running of essential services.

Role of Navy

The help of navy is sought for rescuing missing persons/boats on the high sea and for aerial survey of the affected area during Cyclone and Floods.

7. Fire Service

- To remove men and material from the debris of collapsed houses etc.

- Fire Services are required to check that all the equipments are in working conditions.
- Clearing road blockage due to fall of trees, electric poles etc through fire Brigade.

8. Health Department

Health department of Goa is responsible for following actions in wake of natural disasters:-

- To spread the messages to all Primary Health Centre (PHC) and sub centres about the event.
- Provide first aid to the affected people if necessary.
- Required to keep ready sufficient medicines and first aid materials in their respective dispensaries and hospitals.
- Provide timely medical care to the affected persons.
- Impart Health education to community.
- Proper disposal of garbage.
- Required to keep ready the ambulance and other vehicles for the purpose to transport doctors and the supporting staff.
- Keep informed the Taluka Mamlatdar about the name of the doctor who would be approached in case of need.

- Director of Health Services required to assist the local police in removal of casualties etc by providing mobile vans, ambulances, stretchers etc. To ensure that the Sub Health Centres are properly manned throughout the day and night with adequate stock of medicines etc.

9. Education Department

- Helps in providing shelter
- Supply the list of the officers their residential addresses to be contacted in the event of disaster to Collector, Mamlatdar, Police and Fire Services.

10. Electricity Department

- To ensure that power supply is cut off after receiving the warning of heavy and stormy winds.
- To ensure that power supply is cut off particularly when electric wires are cut off due to fall of poles and trees.
- To ensure that power supply is restored with minimum time.
- To make general public aware of in case of falling of live wires to report the matter to nearest Electricity office.

11. Transport Department

- To ensure that the vehicular traffic is run smoothly on all the roads.
- To ensure availability of Transport to public.
- To ensure sufficient number of trucks ready to be used as per the direction of the State Level Committee.

12. Telecommunication Department

- Telecommunication department is responsible to keep sufficient men and material ready to move at short notice for restoring telephone communications of all the nodal agencies.

13. Civil Supplies Department

- The duty of the department is to keep the fair price shops at the places which are prone to floods/Cyclone etc.
- Make available the sufficient stocks of essential commodities during the season to meet eventuality.

14. Non -Governmental Organisation) (NGOs)

Emerging trends shows that NGO's play key role in managing natural disasters. These are connecting link between disaster managing organisations and local masses at grass root level. Various NGO's like Lion's club, Rotary club, Jesus etc

contribute greatly in management of disaster, educate the public by organising various camps and programmes to generate awareness in crisis situation. They can help in Preparedness, Relief and Rescue, Recovery and Rehabilitation of victims and also in monitoring and providing feed back to the government.

In recent years, NGO's have provided psychological strength to the community to face the disaster. Following is the role of NGO's from pre-disaster to post-disaster in general.

- Educate the public through various awareness programmes and informative camps.
- Psychologically prepare the public to face the disasters.
- Provide immediate rescue help in operation including first aid, supply of relief like Food, Water and Medicines etc.
- Ensuring sanitation and hygiene.
- Help in reconstruction through technical and material aid.
- Monitoring.

All these supporting organisations enable the civil administration to manage the disaster situation.

CHAPTER - V

DISASTER MANAGEMENT: A CRITICAL APPRAISAL

The presentation in this chapter has followed the earlier presented conceptual framework of disaster Management process.

1. Prevention/Mitigation

Actions with in Prevention and Mitigation are designed to impede the occurrence and reducing the impact of disaster. As the actions involved in both are of similar nature both have been discussed together under one umbrella - Mitigation.

Mitigation

Mitigation can be introduced within three diverse context of: Reconstruction; New investment and the Existing Environment. The data demonstrates that Mitigation has been introduced in Goa marginally at all three levels with little greater emphasis on `Structural' than the `Non-structural' measures.

1.A. Structural Mitigation

Structural mitigation measures involves strengthening of existing building by incorporating hazard resistence structures against floods,

have been renovated by the government by providing stone border on river side to help down the action of erosion. The amount spent by the government has to be recovered in 10 yearly installments as arrears of Land Revenue by the revenue Recovery officer called as Mamlatdar.

Existing status quo

There are 547 bunds notified as protective bunds by revenue department in the State of Goa. Apart from this there are large number of other bunds belonging to individuals collective groups of beneficiaries which are not so far notified by the revenue authorities as Protective bunds.

Soil and water conservation scheme: Maintenance of Protective Bunds

Protective bunds and their maintenance is the main component of Soil and water conservation scheme. This scheme carries out soil and water conservation in agricultural areas of the State. The main works associated with the scheme are to protect the agricultural lands from erosion, flooding by rain and saline water, deposition of mining rejects etc and to bring the damaged areas back to cultivation by maintenance of `Protective bunds'.

The maximum limit of cost of repairs is Rs. 12,000/- per hectare. 50% of the cost incurred shall be recovered from the beneficiaries as per Agriculutral tenancy Act 1964 of the State.

- In uplands and undulating agricultural areas other than Khazans', Soil and water conservation' works are taken up for a group of atleast eight beneficiaries at one place. The work such as Contour bunding, Trenching, Check dams, Terracing, Desilting and Clearing of water tanks etc are carried out. The cost of such works are also limited to Rs. 12,000/- perhectare. The major expenditure is borne by the government as measure to protect the cultivable lands from soil erosion and for conservation of water in the catchments of minor water tanks.

1.A.(ii) Dams

Floods and Drought in the State of Goa is managed by two Dams. Selachin Dam in salcete Taluka in South Goa and Kerri Dam popularly named as Anjuman Irrigation project in Sattari Taluka in North Goa. The Selachin Dam has one major canal irrigating Salcete Taluka in Margao. The Kerri dam has got two canals: Left and Right Canals. The Right Canal irrigates Shriroli, Ghotalli, Bharil, Vada, Sankhli, Saravana, Qulam and

Korapur Villages. The Left Canal irrigates Kerri and Mortem Villages.

1.A.(iii) River Embankment

Construction of river bank is another important mitigation measure. A protective wall was constructed in 1986 (198 meters long) on Volvanti river in Bicholim Taluka North Goa to protect Sankhli village from occasional floods. The height of the bank was raised by one meter after 1996 floods.

1.B. Non-structural Mitigation

1.B.(i) Legal framework

Existing disaster related legislation puts less emphasis on mitigation programs. Land use planning, and application of Building codes/by laws provide some legal basis for successful Mitigation.

1.B.(ii). Land use planning

Land use planning does not figure in disaster related plans. It has been reported that there are no definite `Land use maps' for the event of disaster. No definite sites are allotted for `Evacuation and Rehabilitation' in disaster planning for disaster victims. There are no cyclone shelters available in flood and cyclone prone areas. However of late, Town and Country planning department has earmarked the two

areas for temporary shifting of people at the event of disaster: i)compala parade ground (Exhibition ground) and (ii) Altinho ground at the top. It was expressed that only after Latoor earthquake a committee was formed under the central government directive. The Town and Country planners wish to concretise the suggestions in terms of rules and regulations.

1.B.(iii). Building Codes/Laws

There are general `Building codes' `by Laws' for construction of structures in rural and urban areas. Though Goa is a hilly terrain and comes under seismic Zone 4, but has not faced disastrous earthquake in the past. Same is true for Floods and Cyclones. Minor floods and Cyclonic winds are also occasional. Therefore structural safety standards in terms of building Cyclones, Earthquake and flood resistent Structures are almost non existing. However, there are indirect measures adopted by the Town and Country planning departments. High rise buildings are only allowed in commercial area of one lakh seventy thousand square metres called as Plato Plaza developed by Economic Development Corporation. The normal height of buildings in Urban residential areas is 14.2 metres, 0-20.8 metres in commercial area and 0-9 metres in rural and coastal areas. The

maximum height 24 metres (eight storied) is permitted in a very small zone named as C1.

Development plan Regulations are done by the planning and Development authorities.

(i) North Goa Authority controls over Panjim and Mapusa, (ii) South Goa planning authority over Margao and Ponda, and (iii)Vasco Planning Authority controls over marmugo (Vasco). Goa also has Municipal Councils with full enforcement staff and qualified architects to prepare residential and commercial plans but does not especially focus on disaster mitigation. Village areas are controlled by village panchayats and village plans are approved jointly by village panchayats, Technical Officers from Town and Planning Department and Engineers from PWD department.

1.B.(iv) Training and Education

Training and Education relevant for Disaster Management occupies a back seat in Goa. There are no specific Training and Education programs such as : Public Awareness programmes, Disaster Management Programmes for disaster management Officials, Panchayats members, NGO's and Community.

However, this does not undermine the disaster managing capacities of people. Personal experiences with different kinds of disasters especially floods and cyclonicwinds faced over a period of time by people in combating the disasters had contributed in developing Self-management skills.

1.B(v) Other Institutions/N.G.O's etc

Not many organisations are working to enhance disaster Mitigation capacity of People of Goa. Only two N.G.O's were reported as little active on the event of disaster specially in Relief distribution activities. However, people at large have developed their capacities and skills thereby enhancing their ability to deal with disaster.

Though there is a formal institution of Panchayats which can serve as a link with outside resources and community but not much role was reported by the villagers in handling the disasters.

1.B.(vi). Incentives

Incentives provide better motivation for Mitigation than legal impositions. Incentives in terms of Government Grants and subsidies to pursuade commercial and other institutions to include mitigation measures in their building and reconstruction activities are non-existing. As reported earlier, the government technical assistance for

using hazards resistance structures is lacking. The data seems to reflect the greater amount of dependency of people affected during disaster on State Government.

1. C. Critical Appraisal

The data demonstrates that Mitigation measures have been introduced in Goa in all the three diverse contexts: 1. New Investments in terms of Construction of New Dams/Embankments; 2. Reconstruction Maintenance of Protective bunds in Islands; Raising the height of River Embankments and maintenance of Protective mud wall in the Pernem area of North Goa and 3. Existing Environment by indirectly enforcing `Building Laws' permitting limited height and stories of houses in Rural, Urban and Commercial areas. These activities do provide a glimpse of long term mitigation measures and reflect the awareness of Administration towards saving lives/property in the event of disaster. But all these activities focuss upon saving more of Agriculture of Goa from Floods and Cyclones. Direct mitigation measures to save the property/lives from Earthquake is relatively non-existing.

Interestingly people of Goa including the disaster managers bestowes lot of faith in God and are greatly governed by their religious values in their day to day administration. One of the very senior official very proudly said that "Nothing will happen to Goa, it is Parsuram Bhumi". All these religious faiths have been nurtured over a period of time strengthened by the past experiences. These have strengthened the religious faiths/values to the extent that the people including the disaster administrators do not even talk about Earthquake while discussing the natural disasters. There seems to be lack of readiness, alertness on the part of government to institute and carry through the appropriate mitigation programmes with specific reference to Earthquake-disaster. However little awareness seems to have been generated after `latoor Earthquake' as reported by the planning and Development- officials whereby they wish to concretise the plans and formulate and implement bylaws to save the lives and property from disaster.

Though the mitigation measures in the area of Reconstruction: Maintenance of Protective Bunds in some parts of Goa are

effectively managed but their efficacy is under question in the area of Mandovi islands.

Current status of Islands protected by protective bunds

Chorao, Capao, Divar, Jua and Cumbarjua are five important islands worth mentioning in discussion of Protective bunds and their management. These are popularly known as Mandovi islands and form the Goa's important cultural heritage.*

Repeated Grievances have been reported by the inhabitants of the above islands and also by media about the current grim situation of the islands. Goa Assembly passed the resolution in the past to conserve these islands but no step for their preservation has

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* These islands have been divided from each other by `Creeks' and `Backward Waters' from the bunds.

1. Kamat, Nand Kumar, "Mandovi Islands in peril" Navhind Times, Edition of Today, 1999.This article was treated as a Writ Petition and was issued to chief secretary, Government of Goa, Panaji, on 15th March, 1999.

been taken by authorities till now. This has resulted into continuous deterioration of these island cutting them off from the other parts of Goa to certain extent

Divar, chorao and Jua face bleak future today. People do not hesitate to report that "It seems that the administration has no knowledge of Ecological history and Ecosystem characterised of these islands". Out of all the five, Divar island is one which is facing grave threats on account of `Man made' and natural Disasters. It is discernable today only though aerial photographs and Indian "Remote sensing statelite imagery". These islands have got a interesting history which provides a snap shot of mangement of natural disasters. The island remains intact to this day because of the soil embankments which girdle the low lying fertile soil-khazans. These embankments are externally fortified with biofencing of diverse `Mangrooves' species. The Mangrooves bore the brunt of tidal erosive forces, turbulent sediments, loaded currents and discipate the energy of fast floods. In the earlier days once the island acquired a resonable degree of ecological stability, settlements spread in lush green villages - Navelim, Gotlim, Matar, Naroa, Amborim, Chorao Caraim, CapaoJua and

Cumbarjua . During the reign of Goa Kadamba dynasty the islands prospered and acquired cosmopolitan trade. These five islands were serviced by six navigable channels and seven points of confluence of tributaries. These waterways boosted trade based on Agro horticulture and fisheries.

The Portugeese understood the importance of embankments when they conquerred Goa Considering these as defense structures the colonial regime strengthened the girdling system and placed common batteries at Chorao and Divar. Artificial floods were created by breaking the embankment to halt the advances of enemies. The understanding of this sytem was one of the reasons for the failure of the Maratha army led by Shaubha ji which had reached as close as Dhaulim and captured the st. stephen (antoEstavam) fort and than retreated suddenly.

With the pace of development the marine traffic in both the channels - Mapusa and Mandovi increased phenomenally after Goa's Liberation. The commencement of `Barge trafic' was the first development after the second world war resulting in erosion

of external embankments."The communidadas of islands became bankrupt and had no manpower or resources to maintain and repair the wrecking Embankments. The Tenancy Act drove the last nail in the coppier by creating a voluntary system of tenants association supervised by Mamlatdar sitting in the capital city. There was a total chaos as the island could not question the socialistic intention of government but were getting weeker and erosion increased substantially.

Eversince liberation, the State Government has spent almost Rs. two crores on plugging the breeches in bunds at Divar and Chorao without any integrated plan to save the islands. Pisciculture is another reason reported by the general inhabitants of islands and government officials " in frequent breaking of bunds. A cartel of opportunitistic piscicultivists has descended on these islands and hijacked the committees of Tenants Association. The contractors who are supposed to protect the embankments and bunds have joined hands with Piscicultivists to make profits. The standards of repair works have been compromised. The deliberate breaking of protective bunds by

creating breeches sometimes results into flooding the roads and low lying Khazans thereby damaging the existing crops and resulting in more salinity. It was reported that Mamlatdars has turned a blind eye to the situation. Irregulated Land Development under the Panchayat has also cholked up the arterial network of the Islands internal drainage system aggravating the flood situation in the area. Inspite of sincere efforts and intentions of the government to save the islands, the situation continue to be grim. The government has expressed its inability to fully correct the situation and has attributed the situation to lack of funds also.

Present situation reveals that there are breeches in 12 bunds in Tiswadi Taluka, 3 bunds in Bicholim Taluka, 16 bunds in Ponda Taluka and 2 bunds each in Pernem, Marmagoa and Salcete Talukas and one in Bardez Taluka. However, inspite of all these weeknesses the role of Agriculture department for saving the standing crops, facilitating farmers to have crops whenever possible, the action for the closure of breeches, infilteration of holes and rectification of severely washed out portions of bunds is worth appreciating.

Risk and Vulnerability Assessment

`Vulnerability Maps' for Flood/Cyclone and Earthquake which are most probable disaster for Goa has been prepared by BMTPC: Building Material Technology Promotion Council, Ministry of Urban Affairs, Govt. of India but `Microzonation Maps' for these disasters are not available. The data reports a different story. Interestingly the information that Macrozonation maps exists for Goa is not known to concerned state government officials. This clearly demonstrates a lack of coordination between center and the State Government. The scientific accurate assessment of disaster hazards and vulnerabilities which contribute and adds to greater efficacy of Mitigation Measures is very much needed in the current situation. No accurate programmes to identify the vulnerability of areas and population to natural disasters has been reported. In addition there is inadequate accurate evaluation of all reasonable mitigation measures projects to arrive at sensible gains and Loss comparisons. No comparisons are available whereby instituting the mitigation programmes the state is going to be benefitted, the cost and the expenditures involved as against the losses which might arise if nothing is done.

Non-structural Mitigation measures are week aspect of disaster management mechanism. Clear cut `Land use maps' for Evacuation, Resettlement and Rehabilitation of disaster victims are the pre-requisite for effective `Response' mechanism in managing natural disasters. These need to be formulated and implemented.

Direct mitigation measures such as Flood/Cyclone/Earthquake resistent structures are required. There is a need to provide incentives by the government as well as training & Education to create awareness among masses to incorporate the hazard resistent structures in their residential houses and also in government buildings.

Formal Training and Education in management of disasters should have been the strongest capability of any population was found to be almost non existing in the State of Goa except in the form of `Do' and `Donts' on the event of disaster. There is a greater need for Public Awareness and Disaster Management

programmes for disaster management officials, Community, Panchayat members, N.G.Os and school children.

No N.G.O' was found to be associated in the development programmes for the community. The Government can provide greater funds to N.G.O's to take up community developmental activities along with relief activities at the event of disasters.

2. *PREPAREDNESS: A CRITICAL APPRAISAL*

Disaster planning is the ability to deliver its goods and services in the `as intended manner,' utilising its as intended processes, methods and procedures, whenever any out of course event might impair, impact, impede, interrupt or halt the as intended workings and operations. Disaster planning is a medium to sustain the organisation.

2. A. *Contingency Action Plans*

As stated earlier Goa is not a major disasters prone state but it does face minor disasters like heavy rains, with Cyclonic winds and floods Lightening, Landslides, Uprooting of trees due to heavy winds and house collapse during monsoon. The state of Goa has developed a State level and District wise contingency

plan for disaster management (See Annexure - 1). The detailed district contingency plan was available for SouthGoa but the plan for North Goa could not be procured. The contingency plan of South Goa broadly defines the objectives and Roles of various departments. This plan has laid down the `Action points' to manage the disasters and roles of various departments on the event of disaster.

2.A.(i) Aim and contents of State Contingency Action Plan

The purpose of planning is to anticipate future requirements thus ensuring the application of effective and coordinated response. This suggests that planning should cater to whole scope of `Disaster Management Cycle'. Careful analysis of the `Action Plan for fighting cyclone and other Natural disasters indicate that it does not really cover all the activities of disaster Management cycle. The aim of the plan is to fight the disaster. An attempt has been made in the State level contingency plan to define the duties of the various public functionaries involved in providing `Relief' or taking other required steps at the time of cyclone or other natural disasters. This clearly suggests that the aim of disaster

Management is to effectively handle the `Disaster response phase'. Possible range of preventive mitigation measures such as construction of Dams, Flood control measures construction of Cyclone shelters, Community development programmes, Building Codes, Land Use Regulations and Safety Codes which are main feature of Disaster Management do not figure in the contents of both State and District level Disaster Preparedness Plan. The other contents of the plan such as Recovery and Rehabilitation also do not figure in the contingency action plan.

2.A. (ii) Roles and Responsibilities

The contingency `Action Plan' has laid down the Action points and Roles and Role Responsibilities of various departments/key actors on the event of disaster. For example, some action points for flood disaster mentioned in the district wise contingency plan are as follows:

- Steps to be taken to minimise flooding of areas and damages due to floods.
- Timely maintenance of all flood protection works.

- Monitoring of minor works which may contribute to over all flooding.
- Clearing choked rivers/banks/beds/nallas drains and gutters.

Another example about the role of collectorate it is mentioned that `Collector' with his subordinate officers shall collect the information well in advance about the sites where there is a possibility of having floods, landslides etc in the rainy season and where preventive action is required to be taken. The Mamlatdars and Block Development officers in coordination with the village Panchayats Secretary, Talathis and also Gram Sevak as well as Sarpanch and Panchas shall take immediate action to reduce all sorts of assistance to the affected people including, medical, Food and clothes etc wherever required.

The Action points mentioned in above two example do reflect the broad activities to be undertaken before the on set of disaster but lack well defined plans to undertake various activities at the event of disaster. Well defined roles/activities of each incumbant of the role is missing. The description of the roles and activities has an inbuild possibility of duplication of activities with

possibility of confusion and chaos in managing the response operations. This suggests that there is a need to streamline the various roles with well defined activities together with names of officers and suggested time frame for each activity. Disheartening feature of the plan is that it does not mention names of Evacuation sites and Recovery and Rehabilitation plans.

The other salient feature of the content of the plan is organisation structure at state level with Relief commissioner and the nominee of the chief secretary as the incharge of the Relief measures and (2) State Crisis Management Group also called as State level Committee discussed earlier.

2.A(iii). Coordination

Since coordination is the main feature of the counter disaster activities the plan should include the optimum system for direction and coordination. Careful analysis of the plans indicates that the operational aspects as to how the various disaster managers/key actors, whether civil administrators, or other organisations would really act or operationalise the various key activities to have a wholistic effective disaster response with each other is lacking. Each activity with its ways/systems of

accomplishing the purpose together with time frame is not included in the plan.

2.A.(iv) Short-term Emergency plan

The State level control room is the main feature of the short-term Emergency plan. The action plan indicates that Relief commissioner will establish Emergency Operation Center (Control Room) as soon as disaster situation develops. It is mentioned that control room will have all informations regarding forecasting and working of the disaster action plans for implementation and details of contact points and various concerned agencies. Here also we have found that detailed activity plans and how these plan would be accomplished is not indicated in the plan.

2.A (v) District contingency plan for Cyclones

District contingency plan for Cyclone seems to be more detailed as compared to flood disaster plan. The set of activities which are to be performed by the civil administration officials after the first warning and second warning are listed in the action plan.(see the Annexure -2). But how these would be operationalised are still

not very clear. Same is true for post cyclone measures. All broad activities are listed in the contingency plan.

Instructions to the Public

Interesting feature of the plan is the instructions to the public. Fairly detailed instructions regarding `precyclone and post cyclone measures' have been listed in the plan for public to be followed at the event of disaster but how these will be communicated to the public is missing.

2.A.(vi) Possible impact

The social, Economic and health consequences of natural disasters such as flood, Cyclone fire drought and Earthquake have been carefully coded.

2.A(vii) Response required

The contingency plan also indicate the various type of responses required for each natural calamity (as shown in Annexure - 2) together with who will perform the activities. The plan seems to be quite detailed but it again lacks the time frame.

2. B. *District contingency plan for `Earthquake'*

The contingency plan for Earthquake disaster is also quite detailed with respect to the action points and by whom but lacks how the various activities would be performed. It also does not talk about the time frame. (See Annexure - 2)

2. C. *District contingency plan - Drought*

The action points have been listed for the management of drought also but again it lacks how it will be operationalised.

2. D. *Format of the Plan*

The format of the `Contingency Action plans do not really follow the systematic sequencing of various activities of disaster management cycle. It needs to be more detailed with sequencing of various activities with time frame.

3. *WARNING*

The key responsibility of disseminating the essential warning as a Preparedness measure during natural disaster rests with Indian Metrological department (IMD) called as Colaba Observatory located at Altinoho Panaji, Goa in collaboration with ACWC

Bombay. The major functions of IMD are:

(i) To monitor `Cyclone, Monsoon, and `Sea conditions and Waves and Issue Marine forecasts to shipping Fishermen, Ports, Indian navy and Oil drilling operations.

(ii) To monitor the weather system including cyclones and Issue Warning to State Government, Railways, Irrigation, Agriculture and General Public.

Essential Requirements of the Warning system are as follows:

3. A. Long Term Plan at IMD level

- To convene meetings to review Preparedness measures in the month of March or early April before Cyclone season sets in with nodal person/Alternate/Collector, Relief Commissioner, Crisis Management group and District Committee.
- To disseminate warning message to Port Authority on signal's maintenance and educate them on about meaning of signals.
- Another important long term measure is in educating Public on `Do's and `Dont's though AIR/TV.

3. B. Short Term Plan at State Level

- Setting up of control room to transmit Warning to Revenue Secretary and Collector

- Communicate Instructions from Revenue Secretary
- Extending hourly bulletins to AIR/TV
- Receive, PW issued `Hoist appropriate signal' Instruction to Ports, Liston to AIR for latest information.
- Instructions to fishermen to carry Transistor.

3. C. Salient features of Warning System

Though Goa is affected by minor floods and cyclones but the formal `Warning System' only exists for cyclone.

3.C.(i). Cyclone Warning System:

1. Cyclone `Alert' 48 hours in advance
2. Cyclone `Alert 24 hours in advance
3. Cyclone bulletins communicated to Chief Secretary, Revenue Secretary, Collector, Captain of Ports, Fisheries department and Agriculture Department.
4. Through Phones, fax, CWD's Telegrams.
5. Latest updated hourly information to AIR & TV.

3.C. (ii). Pre-Cyclone Meeting(PCM)

Pre-cyclone meeting is convened by IMD Panjim with all concerned with management of disasters. The purposes of the meeting are as follows:

- To review the cyclonic Preparedness activities of various agencies such as State Government and other departments, Port officials (Captain), Fisheries, Agriculture Department, Health Department and Food and Civil Supplies etc.
- Another important purpose of meeting is to educate the concerned officials with technical facets of Cyclone: what is cyclone? What are Precyclone Actions, definitions of Low pressure system and what to do when storm is there?*

3. C. (iii). Warning message

- Language/Content

  The nature and bind of `Warning Messages' significantly depend upon the ability of people especially the general public

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* Project Director also had the opportunity to attend the precyclone meeting.

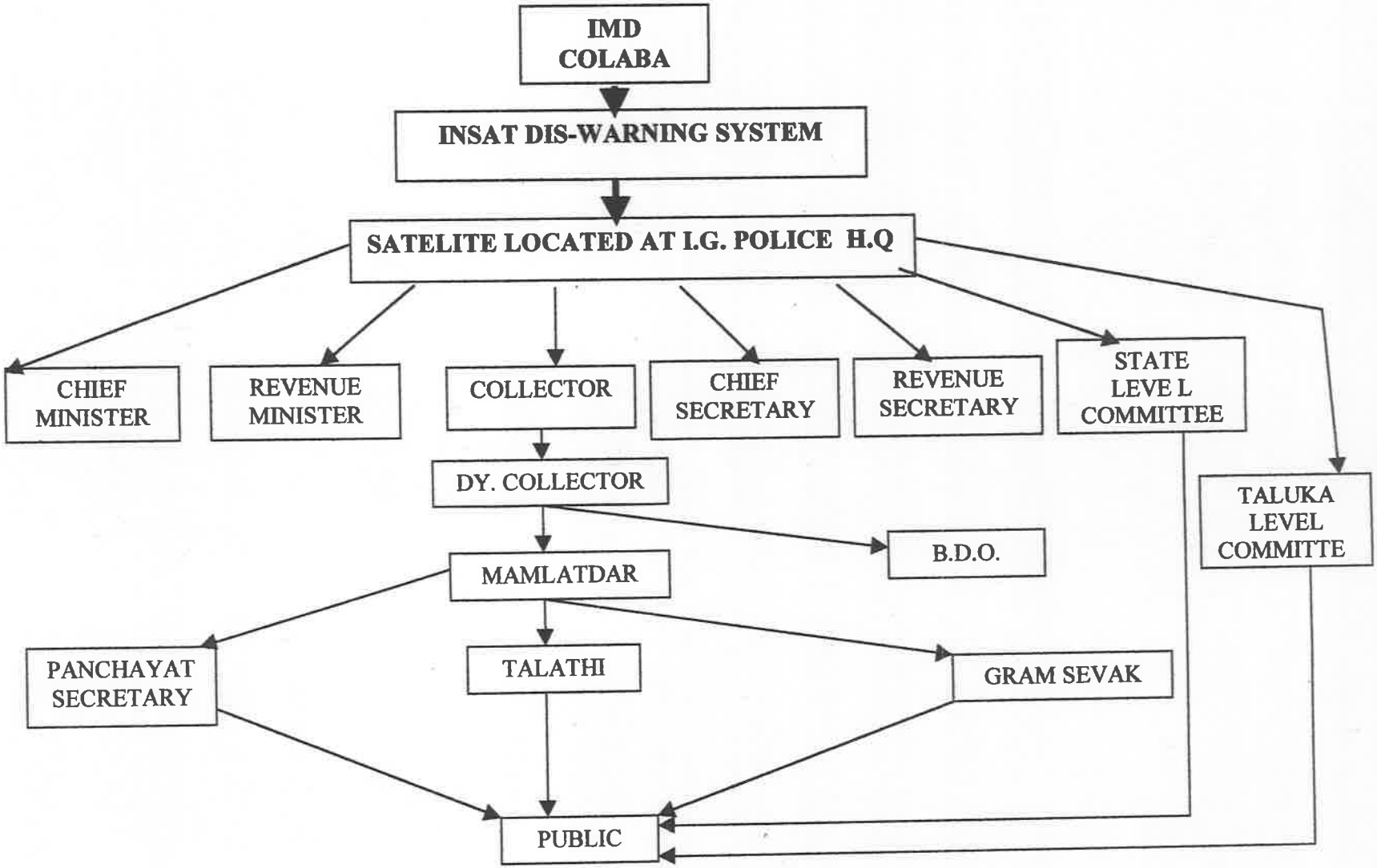
of the Warning messages are Chief Minister, Revenue Minister Revenue Secretary, Chief Secretary, Collectors North and South Goa through Phones, wireless or through other means depending upon the circumstances.

At district level the Collector pass on the messages to Deputy collector who sends the messages to Mamlatdar, Block Development officer and Taluka level Committee at Taluka level. At village level messages are sent to people though Talathi, Gram Sevak and Panchayat Secretary. (As shown in figure- 6).

The messages are send either by Telephone or by making use of police wireless or through such other means depending upon the circumstances. To ensure better communication it is suggested that wireless operators be kept on duty around the clock in office/residence of the Collector throughout the year or at least from April to November.

The above discussed warning system is very much part of the contingency plan.

FIGURE - 6



CYCLONE WARNING SYSTEM

3.C. V Appraisal

Well laid out plan for warning system at State level also has limitations. The most critical feature of the Warning system is the installation of INSAT Disaster Warning System at Office of IG Police which end up in providing a key role to I.G. Police Office in dissemination of the Warning messages which in normal circumstances has to exercise a key role in Response effort. This increases one more channel for communicating the Warning Messages. Though the clearcut lines for sending the Warning messages exist at all the subsequent three levels, but the data shows it does not really happen the way it would have happened. It has been reported by all that the communication lines get converged and all concerned officials are passing on the messages to almost all. Not only the down ward channels exist but upwards channels are also found to exist which sometimes create confusion. It was reported that both upward and downward channels of communication leaves the situation to utter chaos. It was also reported that sometimes the warning messages do not reach the public well in advance. The 1996 flood is an example, where the Sankhli village people reported that if we had been

warned about flood well in advance we would have saved our property and damages could have been greatly reduced.

As many communication channels as the number of people could be easily attributed to the nature of crisis situation where the intention of every individual whether official or any other person from public is to pass on the message to maximum people in least time. Perhaps little alertness to the situation and systematic following of the communication Channels can greatly improve the situation and reduce the Warning Messages Chaos.

4. Response: A Critical Appraisal

Response to natural disasters have evolved over a period of time all over the world. From a purely humanitarian point to offer succor to the victims, the response to natural disasters have to come to address itself to preparedness to mitigate their impact and reduce their occurrences to sustain the development effort.

Certain characteristics which typically apply to `Response' effort are discussed below:

4. A. Type and severity of Disasters

Capacity to prepare oneself for `Response operations' largely depends upon frequency of occurrence and severity of natural disasters. As stated earlier Goa has not faced severe Floods/Cyclone and Earthquake in the past thus not being a disaster prone state does not really call for to have a separate division for management of natural disasters. Therefore not to have a separate department for disaster management seems to be appropriate to suit the present situation.

4. B. Objectives

Based on the experiences from the past the objective of management of disaster continued to be `fight out' the temporary situation. The focus is on addressing the situation as an adhoc `Crisis Management' within the available resources. Therefore disaster management is a part of civil administration wing, a four months exercise from June to September. This indirectly reflects that not much importance is given to management of natural disasters.

4. C. Warning System

Goa seems to have a well conceived disaster warning system as laid down in the `State Contingency Action Plan', and obviously influence the effectiveness of activation, mobilisation and application of response effort. Inspite of the existing system some problem has been reported by Public as well as by disaster management officials. Late issue of warning especially in the flood prone area is the major problem reported by the Sankhli village people. (example 1996 floods referred earlier) Cyclone warning system has worked very well and no problems were reported related to its preparedness measures. Disaster managers views with respect to warning are also worth mentioning. According to them the public in the flood prone areas have become complacent to the warning and do not really respond in a manner as desired and hence lot of problem are faced by in evacuating the area.

4. D. The ability to take Preimpact Action

Success of response effort depends upon the ability to take pre-impact action in the form of Evacuation, Shelter and other Protective measures. Excepting the little problem of `Evacuation'

mentioned earlier no problems have been reported either by public and disaster managers in carrying out the response efforts. This demonstrate that preparedness measures seems to be quite adequate for fighting out the crises situation. The civil administration is able enough to handle disasters of minor magnitude.

4.E. The capability for sustained operations

The another feature of the response effort is the capability of administration to sustain the operations for longer time on the event of major disaster. It has been seen that the resource capacity of Goa administration for management of natural disaster is just adequate to manage disaster of minor nature. However to what extent the civil administration is equipped with enough resources for sustained operations is difficult to answer. For example the reports received from various disaster management officials about minor cyclone of 1996, reveals that the `Cyclone was an eye opener' for administration. This indirectly reflects to a certain extent that efficacy of Goa administration to manage severe natural disasters is under question. Community seems to have

developed self-reliance in terms of self-management skills for managing minor disasters but do not really seemed to be equipped enough to face major disasters. Capability of sustained operations is directly related to `Potential Threats' which is not perceived as important by both disaster managers and community at large.

4. F. Identification of likely response requirements

An important characteristic of response is that it is generally possible to identify before hand the kind of response action which is likely to be needed for any particular disaster. The data shows that the possible `Response requirements' are well identified in advance by the administration.

4. G. Requirements for `Effective Response'

The major requirements for effective `Response ' are as follows:

4.G. (i) General background of preparedness

The effectiveness of `Response operations' largely depends upon Policy direction, planning, organisation and training. Among all discussed earlier, the training is the weakest area found in the disaster management. I find it necessary to mention that nither the

disaster managers nor the community are exposed to any formal disaster management training. This lack of training awareness might also be attributed to the nature and severety of disaster. It was after 1996 cyclone the awareness has been generated about having some formal training in disaster management by civil officers and also the public. But how far they have undertaken training seriously is under question as no training efforts have been reported by disaster managers for them as well as for the community. It is disheartening to note that no N.G.O. is involved in the training of community to enable them to manage disaster effectively and strengthen self-reliance in this area.

4. G.(ii). Readiness of resource organisations

Readiness of Resource organisations (both government and non-government) to respond to disaster situation is essential prerequisite for effective response operations. Interviews with various officials from different organisations did not reveal any problems with respect to readiness of response efforts by all organisations. This suggests that high level of initiative and

alertness to respond to disaster situation exists among various actors of the disaster management.

4. G. (iii). Evacuation

Evacuation of communities, groups or individuals is a frequent requirement during response operations. It was usually reported as a precautionary measure. Minor problems in evacuating the people from disaster prone areas before the actual onset of disaster have been reported by disaster managemnt officials. Since the disaster faced by the people are of minor nature as revealed by the history of disasters, the people of Goa have developed complacency and some time do not respond quickly to warning messages. Usually the evacuation sites utilised by administration are the school buildings etc. Some times the contents of the warning messages are also responsible for delayed response for evacuation. What is communicated is more important than how it is communicated.

For example: The content of the wireless message sent to Mamlatdar and S.D.M. from District Magistrate South Goa reveals the lacuna.

" Rainfall reaching or exceeding 12 cm likely in your area till morning of 18.6.95. Please take all precautionary measures to deal with any situation"

This clearly demonstrates that this bind of messages do not really trigger the desired response for evacuation and such repeated messages may even develop complacency in people. This is also been attributed to lack of well constructed Cyclone Shelters in the disaster prone areas. Therefore clearly demarcated Evacuation sites must be timely communicated to avoid delay in evacuation.

4. G.(iv). Coordination of Response operations

Emergency operations are carried though Emergency Operation Centre(EOC) state level control room at State Level, District Control Room at District Level and Sub-control Room at Taluka Level. Not many problems were reported in carrying out the response operations except that officers at Taluka level and village sarpanch felt the need of more wireless sets for communicating the messages. How the various response operations will be carried out are already mentioned under Roles and responsibilities in the preceeding chapter.

4. G.(v). Rescue

As the state of Goa does not face major natural disasters therefore Rescue operations are not of major magnitude. No noticeable problems were reported by all concerned including the community in rescue operations.

4. G. (vi) Relief

Relief programmes are intended to provide relief to the victims of the disaster. This includes provision of food, drinking water, medicines clothing, food grains, shelter, Payment of exgratia etc. The data shows that `Relief distribution norms exists as per guidelines circulated by the government. It has been seen over the years that the damages because of disaster is of less magnitude mainly in terms of house collapse rendering people home less. The relief distributed to victims is mainly for house repairs, Foodgrains, Medical aid, Water and Shelter. Records from 1993-98 shows that only two deaths occurred because of disasters. No casualties occurred after 1994 onwards. Yearwise allocation and expenditure statement shows that expenditure on relief measures

did not exceed the allocation for the year (as shown in the table - I). This clearly demonstrates that allocated money for relief measures is adequate enough to meet the relief requirements.

Table - I

Year	Allocation	Expenditure	No. of Victims
1993-94	Rs. 3,00,000/-	Rs. 2,58.322/-	59 persons
1994-95	Rs.17,50,000/-	Rs.17,50,000/-	1097 persons
1995-96	Rs. 2,49,000/-	Rs. 2,49,000/-	148 persons
1996-97	Rs.38,50,000/-	Rs.38,49,645/-	706 persons
1997-98	Rs. 2,00,000/-	Rs. 1,17,270/-	53 persons

Table showing allocated Funds and Expenditure for Relief.

No problems were reported by the victims about the distribution of Relief Measures.

5. ***Recovery***

Recovery is the process of restoration of status quo. In the case of Goa it normally includes short-term measures of Reconstruction in terms of restoration of essential services, house repairs and provision of temporary housing. The long term measures of reconstruction in terms of hazard resistence structures are very much required in the present circumstances. This is also true for physical and psychological rehabilitation of affected community. However no problems were reported by the community in this regard.

6. ***Development***

Disaster management occupies a black seat and is not really linked with the process of development. The development such as improved modernised buildings, Building Codes, Community development programmes are not really part of disaster management. All the activities are directed to fight out the temporary situation in terms of mainly Response operations.

SUMMARY

- History of occurrence of natural disasters coupled with strong religious values/beliefs seems to have influenced the disaster management over the years. However it has gradually gained momentum after Goa became a full fledged state.
- Disaster management like any other State is the responsibility of the State government, the Revenue department supported by the central government in relief operations as determined by the gravity of the natural disasters.
- Task is treated as adhoc seasonal activity during May to September with the sole objective to flight the disaster situation and does not really link itself with developmental activities of the State.
- Organisation structure is well defined and suits the present requirements. Revenue Secretary is the administrative head, overall incharge of all disaster management activities at State level. The major controlling task group is State crisis management group or state level committee under the Chairmanship of Relief Commissioner/Revenue Secretary. The group has associated senior

officers from departments of Revenue/Relief, Home, Civil supply, Power, Irrigation, Water Supply, Agriculture, Forests Rural development, Health, Urban planning, Finance, Public works and Panchayat. Coordination is done through "Emergency operation center (EOC) the state level control Room'. Control Room is responsible for transmitting information about the development of crises situation to relief commissioner, communicating to various agencies for immediate action and submitting information to Relief commissioner for implementation of relief measures and appraising the situation on continued basis.

- The department of civil administration takes on the charge of management of natural disasters at district level. All the powers are delegated to the collector of respective district: South Goa and North Goa as an additional responsibility. Collector and Deputy Collectors are the focal role players at district and field level activities. The coordination is done though District control room set up in the Collector's office for Monitoring, Rescue and Relief Operations round the clock from April to November to deal with crises situation. The control room immediately starts functioning in a manner planned earlier with telephone numbers of collector with

a Police Wireless set and Transistor receiver. All messages and orders for immediate action are issued from this control room manned by the duty officer. District Relief Committee functions as a major task group under the Chairmanship of Collector to review the relief measures at district level. It comprises of officials and non-officials including local legislators and members of Parliament.

- SDM/Mamlatdar are the key role players for management of natural disasters at Taluka level. On the event of disaster, `Sub control rooms' are established at all Taluka headquartrs under the respective SDM/Mamlatdar. Mamlatdar with the help of SDM, Police authorities, Fire services, village level officials and NGO's conduct the response operations like temporary shifting arrangements, Evacuation and issue instructions to Talathi, to village Panchayat and Public. He also carries out the assessment of damages.
- The village panchayat is the key actor for disaster management at village level if casualty occurs in village panchayat area.Panchayat makes some provision in the Panchayat budget to give financial aid and assistance to disaster victims. Sarpanch and Panchayat

constant protection. This is done by 1200 kms of total area of protective bunds around coastal islands and villages. There are 547 protective bunds notified by revenue department. Protective bunds and their maintenance is carried through by `Soil and water conservation scheme introduced by Agriculture department of State government. The maximum limit of the cost repair is 12,000 per hectare. 50% of the cost incurred is recovered from the beneficiaries as per Agricultural Tenancy Act 1964.

- Protective bunds in some parts of Goa are effectively managed but there efficacy is doubtful in the case of Mandovi islands. Deleberate breaking of protective bunds to create breeches by Piscicultivist is a major problem faced by government in maintenance of protective bunds. The government also seems to be unable to fully correct the situation due to pausity of funds.
- Mitigation measures in `Existing environment' involves Building laws, building limited height and stories of houses in rural, urban and commercial areas.
- Direct mitigation measures to save the lives and property from Earthquake is lacking.

- Scientific and accurate assessment of disaster hazards and Vulnerabilities of areas and population are non-existing.
- Non-structural mitigation measures is a weak area. Clearcut Evacuation and Resettlement plans, Training and development in terms of Awareness orientation programmes for NGO's, Public and Panchayat and disaster managemnt programmes for disaster managers are almost non-existing.
- The State of Goa has developed State level and District level Contingency plans for natural disaster management. The contingency plans have broadly defined the objectives/Roles of departments and key functionaries involved in providing Relief Operations at the event of Cyclone or any other natural disaster.
- Preventive mitigation measures such as construction of Dams, Flood control measures, Construction of cyclone shelters Community Development programmes, Building codes, land use regulations, Safety codes, Recovery and Rehabilitation which should have been the main features of disaster management plan do not figure in the contents of plan. Lack of ways of operationalising the plan together with the time frame is the

greatest weakness of the contingency action plans at both State and District level.

- Well planned warning system exists at State, District, Taluka and village level for Cyclone only. Warning messages are issued by IMD Panaji though INSAT disaster warning system to all concerned disaster managers at all levels and Public through phones, wireless, AIR/TV, or any other means depending upon the circumstances. Inspite of all good intentions to send the right messages some times it ends up in warning message chaos under severe crises situation.
- Response requirements are well identified in terms of general Preparedness, Readiness of Resource organisations, Evacuation and coordination of various response operations.
- Response operations were found to be well coordinated without much problems in `Rescue' and `Relief' operations excepting little problem in getting affected area evacuated.
- Resource capacity of Goa administration is just adequate to manage disaster of minor nature. To what extent it is capable to manage disaster of major nature is difficult to answer. Community has developed self management skills for managing minor

disasters but do not really seem to be equipped enough to face major disasters.

- Recovery process is only in terms of reconstruction such as restoration of essential services, house repairs and provisions of temporary housing. Long term measures of reconstructions in terms of incorporating hazard resistant structures in building and Psychological rehabilitation of community are lacking.
- To summarise further `Disaster Management' was not found to be linked with the process of development. All the activities are focussed to fight out the temporary situation.

RECOMMENDATIONS

1. History of natural disasters indicate that Goa is not a major disaster prone state but the possibility of major disasters cannot be undermined. Critical scientific assessment of resource capacity of government to manage major disasters should figure among the other priorities of the government.
2. The accurate Vulnerability assessment of vulnerable areas and population which can possibly be affected by different disasters is very much required.
3. Responsibilities of Emergency Operation Center (EOC), District control room, Sub control rooms at Taluka level needs to be more detailed - with ways of accomplishing the activities to avoid duplication and chaos.
4. Functioning of the State level committee needs to be strengthened.
5. Greater attention is to be paid by the government to protect Mandovi islands to conserve Ecology and Ecosystem of Goa.
6. `Land use maps' showing disasters vulnerability, risk assessment etc. need to be formulated for the event of specific disaster.

Evacuation and Rehabilitation sites must be depicted in the `land use maps'.

7. Multipurpose Cyclone shelters needs to constructed in Cyclone and flood prone areas.

8. Structural `Safety standards' in terms of hazard resistant structures needs to be instituted.

9. Incentives needs to be provided by the government in terms of some government subsidies and `Technical assistance' to persuade commercial and other institutions and public to use more of hazard resistant structures.

10. Utmost attention to be paid by government to introduce `Training and Education programmes' such as public awareness programmes in disaster management in school curriculum.

11. More NGO's required to be trained in disseminating disaster management education to community to make them self reliant.

12. Training in `General Disaster Management' needs be organised for disaster management officials with greater emphasis on disaster preparedness and mitigation. More specialised training is required in transferring their attitudes towards management of disasters.

13. There is a need to evaluate all mitigation measures projects to accurately arive at gain and loss comparisons.
14. More stringent measures are required to check piscicultivation to save protective bunds.
15. Irregulated land development under the Panchayat required to be checked to save external network of internal drainage system in Mandovi islands.
16. All State level/District level, Taluka level Contingency plans for Cyclone/Floods/Earthquake needs to be more detailed with ways of accomplishing the plans with the time frame for effective response operations.
17. All state and district level contingency plan prepared in 1996 need updation and revision.
18. A formal warning system must also be introduced for flood.
19. More attention is to be paid to systematically follow the warning system to avoid chaos.
20. More number of wireless sets are required at Taluka and village level for effective response operations.

21. However small the gravity of disaster, the attention is to be paid by the government to psychologically rehabilitate the victims to come back to normal situation through the help of NGO's.

22. Coordination between various supporting organisations working for State at the center needs to be strengthened at the State level.

23. Disaster management needs to be linked with the process of development.

Annexure - I

GOVERNMENT OF GOA

ACTION PLAN

FOR

FIGHTING CYCLONE

AND

OTHER NATURAL CALAMITIES

Issued by

General Administration and Coordination Department
PANAJI-GOA

FORE WORD

Natural calamities, when they occur, take a heavy toll of life and property. With a coastline of above 100 kms. Goa, like other coastal areas, is particularly vulnerable to cyclones. Though natural calamities like the cyclones cannot be prevented, timely advance information and timely disaster management measures can go a long way in mitigating the hardships to the people. With the tremendous advancement in technology and the various methods now available for predicting, fairly accurately, the behaviour of the weather and the sea, the Observatory at Colaba, Bombay, of the Indian Metereological Department, and the INSAT Disaster Warning System at Panaji are able to provide information regarding impending cyclones. The Government has, therefore, prepared this Action Plan for dealing with cyclones and other natural calamities.

An attempt has been made in this Action Plan to define clearly the duties of the various public functionaries involved in providing relief or taking other required steps at the time of a cyclone or other natural calamities. Although the district Revenue officers have to be the focal point of the action, the role of other departments is very much crucial and unless all the departments work together in a team spirit, the Government would not succeed in its efforts.

I, therefore, expect all the concerned officials to work with zeal and devotion so as to reduce the distress to the affected population. A Committee at the State level and others at the Taluka level have been constituted to co-ordinate the various measures to provide relief to the people in time.

The public also needs to be properly informed of the steps and precautions that they should take in these times. It should be made aware of the officials and the places from where to except relief at such times. I expect that all concerned would carefully go through the Action Plan and take action accordingly.

Dated : 28.6.1995

(Dr. D.C. Misra)
Chief Secretary

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ACTION PLAN FOR FIGHTING CYCLONES AND OTHER NATURAL CALAMITIES LIKE EARTHQUAKES AND FLOODS:

1. GENERAL INFORMATION

The State of Goa has an area of 3,701 sq. kms. and it is divided into 11 Talukas and 429 villages. Almost every village has a Temple or a Church and School buildings. It has a coastline of about 100 kms. The Mandovi and Zuari rivers are the two major rivers. The State has a good network of roads including National Highway No. 17 and 4-A. The State receives rain for about 4 months in a year i.e. from June to September and the average rainfall is about 120". The main markets are at Panaji, Margao, Mapusa and Vasco. Besides, every Taluka Head Quarter has a small shopping centre/market, Fire tenders are located mainly at Panaji, Margao, Vasco-da-Gama, Mapusa and Ponda. The State has naval and army installations located in Vasco, Panaji, Margao, Bambolim and Ponda.

2. WEAHER WARNING

Weather Bulletins are issued by the Colaba Observatory under the Indian Metereological Department. Besides sending regular messages to All India Radio, the Colaba Observatory sends alert message to the Chief Secretary and the District Collectors 48 hours in advance about any depression in the Arabian Sea. Thereafter the said Observatory sends warning depending on the weather situation. Thereafter, the incharge of the Metereological Department at Altinho, Panaji remains in close contact with the District Collectors informing them about the movement of cyclone.

The Observatory sends message through various means such as telegrams, fax, etc., simultaneously.

An INSAT Disaster Warning System has been installed in the Office of the Inspector General of Police at Panaji, which will receive signals through the satelite in case of any impending cyclone. On receipt of any such signal, the Office of the Inspector General of Police should pass on the information to the Special Secretary to the Chief Minister, Revenue Minister, the Chief Secretary, the Revenue Secretary the Under Secretary (Revenue) and both the Collectors, all the other members of the State Level Committee as well as to the Chairmen of Taluka Level Committees. The Office of the Inspector General of Police will convey the message over the Telephones, or by wireless or through such other means depending upon the circumstances. Both the Collectors will also pass on the information received, to the Chairmen of the Taluka Level Cyclone Committees either by Telephone or by making use of the Police wireless or through such other means depending upon the circumstances. To ensure better communication, it

is suggested that wireless operators be kept on duty round the clock in office/residence of the Collectors throughout the year or at least from April to November.

Both the Collectors will make arrangements for keeping their Offices open on Sundays and Holidays at least during the peirod from April to November when cyclones are more likely to occur. The SDO's/Mamlatdars will also make arrangements to keep their offices open on Sundays and Holidays during the said period to receive messages and convey the same to the members of Taluka Level Committees for action. The staff shall be deployed by rotation, for this purpose, in the Control rooms and Sub-Control rooms.

The State-Level Committee and the Taluka Level Committees will take steps to pass on the information to the general public as mentioned in Para 6 below and take necessary action for rescue, evacuation and relief measures.

3. CYCLONE COMMITTEE

A permanent State Level Committee has to be set up to organise and implement measures to save loss of life and property due to natural calamities. The Committee shall be constituted of the following Officers:-

1.	Chief Secretary	.....	Chairman
2.	Revenue Secretary	.....	Member
3.	Collector, North Goa District	.....	Member
4.	Collector, South Goa District	.....	Member
5.	Director, S.T.E.	.....	Member
6.	Representative of the Station Commander	.....	Member
7.	Representative of the Navy	.....	Member
8.	Chief Engineer (P.W.D.)	.....	Member
9.	Supdt. Of Police(North Goa)	.....	Member
10.	Supdt. of Police (South Goa)	.....	Member
11.	Director of Health Service	.....	Member

12.	Chief Engineer (Irrigation)	.....	Member
13.	Director of Agriculture	.....	Member
14.	Director of Municipal Administration	.....	Member
15.	Director of Panchayat	.....	Member
16.	Captain of Ports	.....	Member
17.	Director of Fire and Emergency Services	.....	Member
18.	Director of Civil Supplies	.....	Member
19.	Director of Fisheries	.....	Member
20.	Director of Information	.....	Member
21.	Chief Electrical Engineer	.....	Member
22.	Divisional Engineer (External), Department of Telecommunications Panaji	.....	Member
23.	Station Director All India Radio	.....	Member
24.	Station Director, Doordarshan, Altinho, Panaji	.....	Member
25.	Director of Education	.....	Member
26.	Representative of Director, Metereological Department,Goa	.....	Member
27.	2 M. P. s } to be nominated by 2 M.L.A.s } the Government	.....	Members
28.	Under Secretary (Revenue)	.....	Member Secretary

3-A. There will also be a Cyclone Committee at the Taluka level under the Chairmanship of the Dy. Collector/Sub-Divisional Officer in Taluka Head Quarters where the Office of the Deputy Collector/S.D.O. is functioning and in other Talukas, under the Chairmanship of the respective Mamlatdar. The representatives of the following Departments will also be the members of the Committee.

1. Health Services
2 Public Works Department
3. Fire Services
4. Electricity Department
5. Police Department
6. Irrigation Department
7. Education Department
8. Mamlatdars in case where the committee is headed by the Dy. Collector/S.D.O. 1. Chairperson of Municipal Council.
9. 1 M.L.A. and 1 Sarpanch to be nominated by the Government
10. B.D.O. and Talathis

4. DUTIES OF THE COMMITTEES:

Both the State Level and Taluka Level Committees shall be responsible for the following:-

a) To educate the public on hazards of natural calamities like cyclones, flood and earthquakes;

b) To make arrangements for emergency action;

c) To evacuate people whenever necessary;

d) Rescue and rehabilitation;

e) Post calamity review.

5. MEETINGS OF THE COMMITTEES:

The State Level and Taluka Level Committees shall meet in April and August every year when usually there is a threat of cyclones/flood. Besides these regular meetings, the Committee will hold emergency meetings whenever any information about an impending calamity is received from the warning centre. In these meetings a comprehensive review of the action already taken and required to be taken will be made. Thereafter the Committees will continue to meet every day till the time the threat is over.

6. WARNING/ADVICE TO PUBLIC:

As soon as the warning is received, immediate measures should be taken to give wide publicity of the impending calamity, its intensity, likely area to come under its impact and resultant damages it might cause. This publicity will be given through Radio, Doordarshan, Press, Cinemas, etc. by Metereological Department of Colaba Observatory. The warning and instructions issued by the Taluka Level Committee from time to time will be passed down to the affected people not only through the Press, All India Radio etc., but also by beat of drums, vehicles mounted with loud speakers etc. In addition, the officials at the village level namely Talathis, Gram Sevaks and the Village Panchayat Secretaries will be responsible for passing on the information to the affected people. The concerned ward member of the village Panchayat will also be responsible for passing on the information to the affected people.

a) *All India Radio/Doordarshan:-* The A.I.R., Panaji and Doordarshan will broadcast suitable programmes informing the public about the possible hazards/dangers of cyclone and also steps to be taken by the public to protect themselves against such threats. This will be done as frequently as possible and will be in the nature of interviews, lectures etc. Special warnings in bulletin form shall also be issued at regular intervals.

b) *Press-Newspapers:-* The Director of Information shall release notices/warnings for the information of the public through the press and ensure its publication in all the local newspapers. Selected articles on the subject of cyclonic/storms/floods, earth-quakes, damages caused by these calamities and protective measures to be taken shall be published in the newspapers and other educational media.

c) *Films-Posters:-* The Director of Information shall also procure films on cyclone, floods and earth-quakes and have them screened in the villages and cinema halls for the benefit of the public. Besides, posters depicting the hazards of these calamities and caution to be taken by public will also be printed by him and pasted at various public places/offices for the information of the general public.

d) The State Level Committee will get booklets/leaflets printed in sufficient number containing advice on the precautions to be taken by the public in case of cyclones and other natural calamities giving details of dos and don'ts so that these leaflets can be distributed to all the households in the State especially in the coastal areas. Members of the public should be asked to keep this book handy for reference by the members of the family at all times.

7. PRECAUTIONS TO BE TAKEN BY THE PUBLIC:

Public would be required to take the following precautionary measures immediately on receipt of the warning:-

a) Check the houses, secure the loose tiles by cementing wherever necessary. Repair the doors and windows.

b) Check the area around the house and remove dead or dying trees, anchor the loose objects like zinc sheets, loose bricks and sign boards.

c) Keep some wooden boards ready so that they can be placed across the glass windows.

d) Keep hurricane lanterns filled with kerosene, torch lights and enough dry cells.

e) Promptly demolish old building in dilapidated condition.

Besides, public can be advised to undertake house repairs etc. before April to minimise the damage.

8. MEASURES TO BE TAKEN WHEN THE CALAMITIES STRIKE THE AREA:

The Collectors should ensure that relief is sanctioned to the affected persons expeditiously. They should also send such proposals to the Government expeditiously whenever Government approval is required.

The details of all the huts and the houses in the villages are available in the electoral rolls with the Mamlatdars. Almost all the houses are covered by the electoral rolls as there would be at least one voter from each house. In time of necessity this list will be used by the Mamlatdar for contacting the people living in the affected area. Public is to be informed to take following measures when the cyclones actually hit the coast:-

a) Keep the radio on and listen to the broadcast on the calamities. Pass on the information to others.

b) Avoid being misled by the rumour mongers. Pass on only the authentic information listened on the radio.

c) Get away from low lying beaches/areas to a higher ground.

d) Evacuate promptly if asked to do so by the authorities.

e) Bond up glass windows with wooden plans. If no wooden boards are available, paste paper on the glasses.

f) Store extra food especially that which does not require cooking and also drinking water in covered vessels.

9. ACTION TO BE TAKEN BY PUBLIC AT THE TIME OF EVACUATION:

Public to follow the following instructions whenever the authorities order evacuation from a particular area:-

a) Leave for the proper shelter already earmarked by the authorities.

b) Do not worry about the left over properties.

c) At the shelter, follow the instructions of the officer in charge.

d) Remain inside the shelter until informed to move out.

e) Remain calm at all times.

10. CONTROL ROOM:

In an emergency the Control Rooms shall immediately start functioning in the Collectors' offices with following telephone Nos. namely Collector, North- 223612 and Collector, South 223-26. It shall also be provided with a Police wireless set and a transistor receiver. All messages and Orders for immediate action will be issued from this Control Room and it shall be manned by the Duty officer round the clock. The State Level Committee shall also hold its emergency meeting in the control room in the office of the Collector, North Goa District. This control room should work round the clock from April to November.

11. SUB CONTROL CENTRES:

Sub Control Centres shall be established at all Taluka Headquarters. Sub Control at Panaji, Mapusa, Ponda, Quepem,Vaso-da-Gama and Margao will function under the respective Sub Divisional Magistrate. The other sub Control Centres will function under the respective Mamlatdars. These Sub Control Centres will work from April to November round the clock.

12. STORM WARNING CENTRE:

Observatory at Altinho under the Indian Metereological Department with telephone No. 225547 and the Radar Station at National Institute of Oceanography with the Phone No. 224607 will remain in close contact with the Control Room. The Altinho Observatory will function as storm warning centre for the Goa State.

13. A. SHELTERS:

Both the Collectors should keep the list of shelters handy. In every village of taluka of this State suitable buildings have to be identified by the Mamlatdars for converting them into temporary shelters in case of emergency necessitating evacuation of population. Every year, before the onset of monsoon, the Collector and his subordinate Officers will tour the area and inspect these in order to ensure that they are fit for occupation. In case they need any repairs, they shall get them done through the requisite agency. Similarly, the equipment in the Control Room will also be inspected and tested by the technical person before April every year. The list will be further corrected and brought up to date at the time of inspection. The shelters are to be selected by the Mamlatdars with reference to their occupation. The drinking water will be provided in drums. Some of the buildings already have electricity facility. More reliance will be given on the lanterns/torches in case of power failure.

13. B. VEHICLES:

A talukawise list of vehicles/vehicle owners will be available in the District. The actual requirement of the vehicles can be assessed only at the time of relief. A list of petrol pumps is also available. All the vehicles will be sent to nearest petrol pump for refilling. It is not feasible to keep petrol in cans separately, at the village level. All Government vehicles in the talukas will be placed at the disposal of the Deputy Collector/Mamlatdar for relief except vehicles which are required for emergency services by the respective Departments like Fire Services, Water Supply, Electricity, etc.

13. C. FOOD:

The shelters will be made use of only for accommodating the persons affected. The provision for rice, wheat, etc. are available in the nearest Taluka godown of the Civil

Supplies Department. The Civil Supplies Department will keep the essential food articles of approximately one month's requirement of each Taluka as reserve in their godowns, taking care to see that the old stock is so rotated that the stored food grains are not spoiled. Mamlatdars will make arrangements for providing cooked food to the affected persons in the shelters, through the Talathis/Village Panchayat Members. It is expected that the evacuated persons will bring their own beddings. Articles like torches and umbrellas will be kept in the Civil Supplies godown, verification of which will be done by the Mamlatdars from time to time. Though the godowns are under the Civil Supplies Department, day to day functioning of godown is done by the Mamlatdars. In the event of break down of water supply, the well water stored in the drums in the shelters will be made use of. The Water Supply Division of the P.W.D. will be responsible for seeing that the water is potable and for purifying wherever necessary. In the event of breakdown of the electricity, lanterns will be made use of. Fire fighting units are located at Panaji, Mapusa, Margao, Vasco and Ponda. The rescue sqads are stationed at the Police Station Quarters and will consist of the Policemen and Home Guards.

14. CONDUCT OF ACTUAL RELIEF AND RESCUE OPERATION:

For a coast line of about 100 kms., at least three hours are required to initiate protective measures to cover the population. Following action shall immediately be taken on receipt of a final warning:

a) Detailed information shall be collected by the Collector and promptly conveyed to all the Sub Control and public informed through phones, radio, beat of drums, loud speakers, etc.

b) The Police, P.W.D. Electricity Department, Directorate of Health Services, etc., who are members of the Committee will immediately alert their field staff for going into action and they will remain on duty all 24 hours till the emergency is over. In this context they will act according to the plan drawn by them for their departments. The Director of Transport should collect and keep sufficient number of trucks ready to be used as per the direction of the Committee. The Captain of Ports will issue immediate instructions to all sea going vessels, trawlers, barges, boats, etc. for safe anchorage. He will also ensure availability of sufficient ferryboats for rescue operation in river and sea. Director of Fisheries will also warn the fishermen from going out for fishing and ensure that all the boats are securely tied and nets are stored in safe place. The Divisional Engineer, Telegraphs will keep sufficient men and material ready to move at short notice for restoring telephone communications. The Superintending Engineer (R&B) will keep adequate number of labourers and trucks to clear all the roads of any obstructions. The P.W.D. and the Fire Services should procure sufficient number of mechanised saws to speedily cut and remove fallen trees and clear the roads. Fire fighting escorts will remove men and material from the debris of collapsed houses etc. The station

house officer of each Police Station will also keep his men ready for assisting above operation. He will be responsible for diverting the traffic and keep the roads clear from crowd/obstructions. All the injured persons in his area will be removed to the nearest Health Centre for medical aid. The property of the people shall be suitably guarded by posting policemen and by mobile patrolling. Special attention will be paid for prevention of thefts, pickpocketting and looting. They shall be in constant touch with the Sub Control Centre, Director of Health Services shall actively assist the local police in removal of casualties etc. by providing mobile vans, ambulances, stretchers etc. and also ensure that all the Sub Health Centres, are properly manned throughout the day and night with adequate stock of medicines, injections, etc. Relief and rehabilitation of the affected persons shall be looked after by the Collector and necessary financial and material assistance will be provided to them immediately.

15. HELP OF ARMY AND NAVY:

Assistance of Army and Navy will be sought only when the Civil authorities are not able to handle the situation. The same shall be requested by the State Government as a last resort. The help of the defence services will generally be taken on all above aspects especially for restoring communication on streets and roads, supply of provision and stores. Constuction of temporary bridges will be another aspect where military help will be sought. The help of the Navy will be taken for rescuing missing persons/boats on the high seas and for aerial survey of the affected area.

ANNEXURE- II

DISTRICT LEVEL

CONTINGENCY ACTION PLAN

FOR FIGHTING NATURAL CALAMITIES

SOUTH GOA

South Goa 128

NO.5/1-87-CAB/
Collectorate of South Goa,
Civil Administration Branch,
Margao.
Dated:- 29/11/1994.

To,
The Under Secretary(Revenue),
Revenue Department,
Secretariat,
Panaji.

Sub: Contingency Action Plan for
Natural Calamities.

Sir,

I am directed to refer to your letter No.19/1/94-RD (2152) dated 28/3/94 and subsequent reminder on the subject cited above, and to furnish herewith a draft for Contingency Action Plan prepared by this office pertaining to South Goa District.

Encl: as above.

Yours faithfully.

(G.V.P. Dessai)
Dy. Collector(L.A.)
Margao.

CONTIGENCY ACTION PLAN FOR NATURAL CALAMITIES
(South Goa)

Goa is not a major Calamity prone State. However, the State does face minor Calamities, like heavy rains with cyclonic winds and floods at some parts during monsoons.

Normally, natural calamities like floods, lightening, landslides, uprooting of trees due to heavy winds occur in rainy season and house collapse are there during monsoons.

ACTION POINTS:

I. Steps to be taken to minimise flooding of areas and damages due to floods.

(i) Convening a Meeting of the District Level Committee on Natural Calamities.

(ii) Timely maintenance of all flood protection works.

(iii) Monitoring of minor works which may contribute to overall flooding.

(iv) Clearing and cleaning choked river banks/beds/nallas, drains and gutters.

(v) Clearing garbage and other materials from street corners and pavements.

(vi) Avoiding hoarding of building material on roads, gutters, drains, street corners, river banks, sides of nallas etc.

The following Departments are primarily involved in taking steps to control the floods due to rain water and also provide relief to the affected persons.

1. Collectorate with its sub-offices including Sub-Divisional Offices and Taluka Offices.

2. P.W.D.

3. Irrigation.

4. Municipalities/Village Panchayats.

5. Health Department.

6. Fire Brigade.

7. Police.

8. Captain of Ports.

9. Electricity.

10. Transport.

11. Civil Supplies.

II. Role of different Departments:

1. Collectorate:

(i) The Collectorate through its subordinate offices shall collect the information well in advance about the sites where there is possibility of having floods, landslides etc., in the rainy season, and where preventive action is required to be taken. The Mamlatdars and Block Development Officers in co-ordination with the Village Panchayat Secretaries, Talathis and also Gram Sevaks as well as Sarpanchas and Panchas of the Village shall take immediate steps to render all sort of assistance to the affected persons including medical, food, clothes etc., wherever required. The Sub.Divisional Officers shall also

keep a close contact with the Mamlatdars in this respect and monitor the work of assistance to the affected persons.

The Mamlatdars shall without any delay process the cases for relief to the affected persons and submit them to the Collector through the respective Sub Divisional Officers. They should also keep the Collector informed about the situation from time to time and in case of major Natural Calamity or loss of life, immediately they should report such incidence to the Collector through special messenger, wireless or other mode.

(ii) Functioning of Control Room, when situation demands to get the information from the Taluka authorities for issuing necessary instructions till the calamity subsides for short duration.

2. <u>P.W.D. (Roads and Communication)</u>

The P.W.D. should see that before the rainsy season the gutters and roads are cleared from building material or waste material etc. removed from the road sides. They should also see that the roads are properly repaired before the onset of the monsoons and pot-holes are filled up, nallahs are cleared and take all other steps within their jurisdiction to see that there is proper flow of rain water.

3. <u>Irrigation:</u>

The Department should take steps to clean the nallahs, river banks, beds, etc., so that the rain water does not over flow and enter into the residential areas, thus damaging residential houses.

4. Municipalities/Village Panchayats:

They shall see that the gutters, drains etc are cleared and no garbage is accumulated causing obstacle to the smooth flow of rain water and also to prevent spreading of any epidemic. They shall also render timely assistance to the affected people by whatever way possible including providing food/shelter/clothing and also monitory help.

5. Health Department:

The Department should keep in readiness all the required medicines in case of epidemics etc., and to render timely medical help to the affected persons. They shall also keep in readiness the ambulance and other vehicles for the purpose so also the doctor and supporting staff and should keep the Taluka Mamlatdars informed about the name of the doctor who should be approached in case of need.

6.& 7. Police/Fire Brigade:

They shall evacuate the affected persons in floods/ house collapse etc and take them to safe place and see that the injured get timely medical assistance. The Fire Brigade shall also remove road blockage due to fall of trees, electric poles etc.

8. Captain of posts:

The Department should identify the places where the occurance of the floods during rainy season is of major intensity and requires evacuation of the people in case of emergency and place at these places boats in sufficient numbers.

9. Electricity:

The Department should ensure that power supply is cut off in stormy weather when there is likelihood of falling of trees, electric poles etc., and particularly when electric wires are cut off due to fall of trees, poles. They should also see that power supply is restored within minimum time.

10. Transport:

The Department should see that the vehicular traffic is run smoothly on all the roads and the people are not stranded on account of non-availability of transport.

11. Civil Supplies:

The Department should keep the Fair Price shops at the places which are prone to floods and other such Natural Calamities sufficient stocks of essential commodities during the season to meet eventuality.

Natural Calamity disasters could be successfully implemented with the co-ordination among various working bodies like Police, transport, medical, Government agencies, voluntary and non-Government organisations.

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CONTINGENCY ACTION PLAN

FOR

NATURAL CALAMITIES

INCLUDING ADVICE TO THE

PUBLIC BEFORE, DURING AND

AFTER DISASTERS :

CYCLONES

FLOODS

DROUGHT

EARTHQUAKES

Long term measures

Relief Commissioners or a nominee of Chief Secretary will be incharge of the relief measures

State Crisis management group

There will be a State crisis management group(SCMG) under chairmanship of CS/Relief Commissioner. This group will comprise of

Senior Officers from the Departments of Revenue/Relief Home, Civil Supplies, Power, Irrigation, Water Supply, Panchayat (Local self Government), Agriculture, Forests, Rural Development, Health Planning, Public works and Finance. The Chief Secretary/Relief Commissioner may also coopt on the Group, depending upon the requirement of the situations, one or more of the following persons:-

1. Sub-Area Commander/Station Commander

2. Station Commander of Air Force

3. Flag Officer Command-in-Chief

4. Chairman/Secretary, Indian red Cross State Branch

5. Representative of Meteorological Department Officer-in charge Cyclone Warning Centre, CWC and Flood Forecasting Organisations.

6. General Manager, Railways of the zone converned

7. General Manager, Telephones

8. Chief General Manager, Telecommunications

9. D.G. of State Police

10. Chief Engineer, Road & Buildings

11. Chief Engineer, major irrigation

12. Chief Engineer, Panchayati Raj

13. Chief Engineer, Urban Water Supply

14. Chief Engineer, Rural Water Supply

15. Director of Agriculture

16. Director Of Horticulture

17. Director of Medical Health Services

18. Director of Animal Husbandry

19. Secretary of the State Electricity Board

2o. Secretary, Dept. of Women & child Developtment

21. P.H.E., Dept./Water Supply and Sewerage Board

22. Station Director AIR/DDK

23. Chief Engineer, Border Road Organisation

24. Director, Civil Supplies

25. Regional Manager, Indian Oil Corporation

26. Director, Local Bodies

Short term emergency action

State Level Control Room

The Relief Commissioner of the State shall establish Emergency operation Centre (Control Room) as soon as a disaster situation develops. The control room shall have all information relating to the forecasting and warning of disaster, action plans for implementation and details of contact points and various concerned agencies. It shall have up-dated information about the Air Force, the Navy and the Army for quick interaction in times of emergencies.

State level control room responsibilities

The Control Room will be responsible for:-

1) transmitting to the Central Relief Commissioner information as to the development of a crisis situation as a result of natural disaster on continue basis till the situation improves.

2) receiving instructions and communicating to appropriate agencies, for immediate action

3) collection and submission of information relating to implimentation of relief measure to the Central Relief Commissioner; and

4) Keeping the state level authorities apprised of the developments on a continuing basis.

District level response

Focal point

The Collector or Deputy Commissioner will be the focal point at the district level for preperatioin of the district level plans and for directing, supervising and monitoring relief measures for natural calamities.

Contingency Plans

A contingency plan for the district for different disasters shall be drawn up by the Collector/Deputy Commissioner and got approved by the State Government. The Collector/Deputy Commissioner should also coordinate and secure the input from the local defenc forces unit in preperation of the contingency plans These contingency plans must lay down specific action points, key oersonnel and contact points in relation to all aspects.

District Control Room

In the wake of natural calamities, a Control room shall be set up ini the district for day to day monitoring of the rescue and relief operations on a continuing basis.

District Contigency Plan

Cyclone

Action points

1. Action after the first warning

The Collector should ensure

i) That sufficient stock of foodgrains, kerosene and other dry food commodities are available for distribution to the victims.

ii) That medical and veterinary departments are fully equipped with required drugs and vaccines for taking preventive steps after cyclone and to arrest the spread of epidemics.

iii) That all the Government vehicles are kept in road-worthy condition for putting them to use in the emergency.

iv) That a list of generators available with the cinema theatres and other undertakings is maintained by the officials of State Electricity Board and advance action taken immediately to procure them when necessity arises.

v) That action is taken for opening of cyclone stores for providing the following material.

1) Hooks of the type available with the fire service Department for cleaning debris

2) Rubber tyres and tubes for using as floats in water

3) Tents

4) Kerosene lanterns

5) Large cooking vessels for use in relief camps

6) Identity slips to be issued to be victims in relief camps

7) Copies of maps. etc

8) Ropes, wires, chains, lights with wirefitting lead wires, torches etc.

9) Spare road market stores, steel poles, Bamboo G.C. sheets and slotted stripes of metal (to be laid on churred up road surface for better transportation)

10) Double handle shaws(for cutting fallen trees) shovels, candles, land hailers, Hose pipes, first aid kits, cyclone duty sign board, Ropes, Asbestos sheets, Torch lights, Jetty, Cans, empty oil drums, gunny bags and sand bags, Polythene bags (for dropping supplies) buckets, V.H.E. sets with batteries for use

11) Fodders, pumps for bailing out water alongwith hose spades, crow bars, hand gloves, Eucalyptus oil, napathalene balls, bamboo mats, phenyle slate line etc useful for buring dead bodies.

2. Action after receipt of the second warning
Actual Threat

i) Evacuation

ii) Relief to stranded persons

iii) Stoppage of traffic on National highways

iv) Stock of food grains

v) Declaration of local holiday to the Educational institutions

3. Post Cyclone Measures

i) Convening of the meeting of the Committees

ii) Rescue Operations

iii) Removal of dead bodies and carcases

iv) Health Measures

v) Restoration of traffic

vi) Adequate number of mobile squads shall also be made available by the Police Department for helping clearing the fallen trees etc. and prevention of antisocial activities like looting etc.

vii) Electricity Board should clear the roads of fallen electric poles and restore power supply as quickly as possible.

viii) The Public Relations Department must ensure building up photographic record of the dame simultaneously, using services of the local officers or by employing local men.

IX) Immediately after the cyclone, the Divisional Revenue officers should form required number of teams to assess damage to the houses, crops, loss of human lives, livestock etc.

Instructions to the Public

1. Check house; secure loose tiles by cementing wherever necessary, repair doors and windows
2. Check the area around the house; remove dead or dying trees; anchor removable objects like lumber piles, loose zinc sheets, loose bricks, garbage cans, sign boards etc.
3. Keep some wooden boards ready so that glass windows can be boarded.
4. Keep a hurricane lantern filled with kerosene, flash flight and enough dry cells.
5. Promptly demolish condemned buildings
6. Those who have radio sets should ensure that the radio is fully serviceable. In the case of transistors, an extra set of batteries should be kept handy.

Steps to be taken when Cyclone Warning is received

1) Keep your radio on and listen to latest weather warning and advisories from the nearest All India Radio Station. Pass on the information to others.

2) Avoid being misled by rumours. Pass on only the official information you have got from the radio to others.

3) Get away from low-lying beaches or other locations which may be swept by high tides or storm waves. Leave sufficiently early before your way to high ground gets flooded. Do not delay and run the risk or being marooned.

4) If your house is out of danger from high tides and flooding from the river, and is well built it is then probably the next place to weather storm. However, act promptly if asked to evacuate.

5) Be alert for high water in areas where streams or river may be flood due to heavy rain.

6) Board up glass windows or put storm shutters in place Use good wooden planks securely fastened. Make-shift boarding may do more damage them none at all. Provide strong suitable support for outside doors.

7) If you do not have wooden boards handy, paste paper strips on glasses to prevent splinters flying into the house.

8) Get extra food, especially things which can be eaten without cooking or with very little preperation like dry lunch fast food etc. Store extra drinking water in suitably covered vessels.

9) If you are in one of the evacuation areas, move your valuable articles to upper floors to minimise flood damage.

10) Have hurricane lantern, flash lights and/or other emergency lights in working condition and keep them handy.

11) Check on everything that might blow away or be torn loose. Kerosene tins, cans, agricultural implements garden tools, road signs and other objects become weapons of destruction in strong winds. Remove them and storm them in a covered room.

12) Be sure that window or door can be opened on the lee side of the house i.e. the side opposite the one facing the wind.

13) Make provisions for children and adults requiring special diets.

14) If the centre or 'eye' of the storm passes directly over your place, there will be a lull in the wind and rain lasting for half an hour or more. During this period, 'stay in a safe place. Make emergency repairs during the lull period if necessary, but remember that strong wind will return suddenly from the opposite direction, frequently with even greater violence.

15) Be calm. Your ability to meet the emergency will inspire and help others

Evacuations Instructions

a) Head for the proper shelter or evacuation points indicated for your area.

b) Do not worry about your left-over property as evacuated areas will be policed to prevent looting.

c) At the shelter, follow instructions of personnel incharge

d) Remain in shelter until informed that you may leave.

e) Keep calm at all times. If instructions are observed promptly, there is little personal danger involved.

Post cyclone Measures

After a cyclone passes, the public are advised to take the following safety measures:-

1) They should remain in shelters until informed by those in charge that they may return home.

2) They should get inoculated against diseases immediaely at the neasrest hospital and seek medical care for those injured or fallen ill.

3) Any loose and dangling wire from the lamp post should be strictly avoided. (A person should be kept to watch so that nobody goes near the wire and the nearest electrical authorities should be informed immediately).

4) People should keep away from disaster areas unless they are required to assist.

5) Anti-Social elements should be prevented from doing mischief and reported to the police.

6) Cars, buses, lorries and carts should be driven carefully.

7) Houses and dwelling should be cleared of debris.

8) The losses should be reported to appropriate authorities. It should be remembered that exaggeration of looses is immoral and anti-social.

9) Relatives should be promptly informed about the safety of persons in the disaster area.

ANNEXURE-I

SOCIAL, ECONOMIC & HEALTH CONSEQUENCES OF NATURAL CALAMI

S.NO.	CONSEQUENCES	NATURAL CALAMITIES				
		EARTH-QUAKE	CYCLONE	FLOOD	FIRE	DROUGHT FAMINE
1	2	3	4	5	6	7
1.	Loss of life	X	X	X	X	
2.	Injury	X	X	X	X	
3.	Epidemiological threat		X	X		X
4.	Loss of crops		X	X		X
5.	Loss of housing	X	X	X	X	
6.	Damage to infrastructure	X	X	X	X	
7.	Disruption of communications	X	X	X	X	
8.	Disruption of transport	X	X	X	X	
9.	Panic	X	X	X	X	
10.	Looting	X	X	X	X	
11.	Breakdown of social order	X	X	X		
12.	Short-term migrations			X		X
13.	Permanent migration					
14.	Loss of Industrial production	X	X	X	X	
15.	Loss of Business	X	X	X	X	
16.	Distruption of marketing systems	X	X	X	X	

LEGEND:

[X] DIRECT CONSEQUENCE

[ ] SECONDARY CONSEQUENCE

ANNEXURE-II

STATEMENT SHOWING THE RESPONSE REQUIRED IN RELATION TO NATURAL CALAMITIES

TYPE OF RESPONSE	EARTH-QUAKES	CYCLONE & FLOOD	FLASH FLOODS	DROUGHT	LOCALISED CALAMITIES LIKE FIRE, LANDSLIDES, AVALANCHES, ETC.
2	3	4	5	6	7
Weather Forecasting/ prediction		X		X	
Receipt of warning		X			
Warning Dissemination		X			
Alternate Communication	X	X	X		X
Evacuation	X	X	X		
Search & Rescue	X	X	X		X
Temporary sheltering	X	X	X		X
Disposal of corpses	X	X	X		X
Emergency Health care	X	X	X	X	X
Prevention of Epidemics		X	X	X	X
Establishment of Relief Camps(Food, shelter, Drinking Water)	X	X	X		X
Security	X	X	X		X
Family reunification	X	X	X		X
Post-Disaster Salvage ecurity	X	X	X		X
ire-fighting	X			X	X
ehabilitation (Crops, attle, Alternate houses)	X	X	X	X	X
ontingency Plans:-					
. Crops(Seeds, Fertilisers, Pesticides Petroleum products, Power)	X	X	X	X	
Drinking water	X	X	X	X	X
. Employment Generation				X	
v. Public Distribution System	X	X	X	X	

X = Response required.

S.NO.	RELIEF FUNCTIONS (PRIMARY AND SECONDARY)	DISASTERS					MINISTRY/DEPARTMENT RESPONSIBLE FOR THE RELIEF FUNCTION
		EARTHQUAKE	CYCLONE	FLOOD	FIRE/AVALANCHES/LANDSLIDES	DROUGHT/FAMINE	
1	2	3	4	5	6	7	8
	PRIMARY						
1.	Forecasting and operation of warning systems		X	X		X	IMD/CWC
2.	Provision of communication	X	X	X	X	X	DOT
3.	Wide publicity to disaster preparedness through AIR, TV	X	X	X	X	X	MIB
4.	Transport with particular reference to movement of essential commodities and petroleum products	X	X	X	X	X	DOS/MOR/
5.	Ensuring availability of essential commodities for price control(including inputs)	X	X	X	X	X	DAC/DOS/ MOP/MOC
6.	Ensuring availability of medicines, drugs and vaccine (including first aid)	X	X	X	X	X	MHFW
7.	Preservation and restoration of physical communication links	X	X	X	X		MOR/DOT/D MUD
8.	Investment of infrastructure	X	X	X	X		DAC/MWR/D MOR/MOF/E
9.	Mobilisation of resources	X	X	X		X	MOF
10.	Flow of credit	X	X	X	X	X	MOF/DAC

contd.....on next page

ANNEXURE-III (contd.)

1	2	3	4	5	6	7	8
	SECONDARY						
•	Flood/inflow forecasts			X		X	CWC/APWR
•	Rescue/evacuation operations	X	X	X	X		MCD/MPH/MWRT
•	Relief/rehabilitation/restoration	X	X	X	X	X	DOW/DAC/DID/ MOT/MRE
•	Contingency plans for crops/cattle		X	X		X	DAC/DCE/DCP/ MEF
•	Contingency plans for health measures and nutrition	X	X	X	X	X	MHF/DWCD
	Technical & Technological inputs for provision of drinking water	X	X	X		X	DRD/MUD
	Technical assistance in the water budgeting and water management for various uses			X		X	MWR/MUD/ DRD
	Coordination of the activities of the State and voluntary agencies	X	X	X	X	X	DRD/DAC
	Disaster preparedness of areas	X	X	X	X	X	All from 1 to 29

KEY TO ANNEXURE-III

MINISTRIES/DEPARTMENTS - THEIR CODE NUMBERS WITH ABBREVIATION

CODE NO.	NAME OF THE MINISTRY/DEPARTMENT
01.DAC	Department of Agriculture and Cooperation.
02.DOF	Department of Fertilisers.
03.MEF	Ministry of Environment and Forests.
04.DCP	Department of Chemicals and Petrochemicals.
05.MWR	Ministry of Water Resources.
06.DOP	Department of Power.
07.DCS	Department of Civil Supplies.
08.MCC	Ministry of Commerce.
09.MOR	Ministry of Railways.
10.DWCD	Department of Women and Child Development.
11.MHFW	Ministry of Health and Family Welfare.
12.DOF	Department of Food.
13.DRD	Department of Rural Development.
14.MUD	Ministry of Urban Development.
15.MOP	Ministry of Petroleum and Natural Gas.
16.DPT	Department of Personnel and Training.
17.MIB	Ministry of Information and Broadcasting.
18.CS	Cabinet Secretariat.
19.MOF	Ministry of Finance.
20.PC	Planning Commission.
21.DOT	Department of Telecommunication.
22.MOD	Ministry of Defence.
23.MHA	Ministry of Home Affairs.
24.DOST	Department of Surface Transport.
25.DOC	Department of Coal.
26.CWC	Central Water Commission.
27.DID	Department of Industrial Development.
28.MOT	Ministry of Textiles.
29.DOW	Department of Welfare.

ANNEXURE - 4A

DISTRICT CONTINGENCY PLAN

EARTH QUAKE

ACTION POINTS

I. Planning and Preparation:

1. Identification of earthquake prone areas:

2. Identification of problems:

a) Loss of human life.
b) Casualties buried under fallen debris.
c) Destruction and Damage to Buildings.
d) Disruption of communication by land, sea and air.
e) Disruption of civic amenities e.g. electricity, water, transport, medical, telephones, civil supplies etc.
f) Large scale fires.
g) Floods in certain areas.
h) Landslide in hilly areas.
i) Disposal of human bodies and animals.
j) Exposure to disease and danger of epidemics.
k) Breakdown of law and order.
l) Breakdown of normal Government machinery in affected areas due to Government servants themselves being affected by earthquake.
m) Loss of morale.
n) Movement of population.

3. Identification and Mobilisation of Resources:

4. Command and Control:

5. Advance Preparatory Action:

a) Preparation of Plan and skeleton organisation in advance.
b) Training of Personnel.
c) Establishment of alternative means of mobile communications.
d) Mobilisation of Fire Services including auxiliary firemen.
e) Plans of rescue of casualties trapped under debris.
f) Provision of hospital, medical and nursing staff.
g) Medical plans for improvised first aid posts and emergency hospitals.
h) Removal of Debris.
i) Emergency sanitation, alternative supplies of water, salvage and custody of valuables, procurement, distribution, accounting of gift stores, care of etc.
j) Provision of welfare facilities e.g. care of establishment of Camps, information and guida essential matters, evacuation/people, alterna supply storage distribution of essential comm including food, clothing and shelter.

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k) Disposal of the dead and their identifications.
l) Mobilisation of transport.
m) Requisitioning of vehicles and issue of petrol, oil lubricant, spare parts and repair facilities.
n) Protection of properties including objects of art and things of cultural importance.
o) Special measure for the protection/repair/restorati of essential service communications, industrial and vital plants.
p) Publicity.
q) Prevention of panic and upkeep of morale.
r) Restoration of communications.
s) Liasion, particularly with the Armed Forces.
t) Rehearsal without causing alarm or despondency.

AC 1.

II. AFTER AN EARTHQUAKE

a) Instant reaction
b) Establishment of Control
c) Military Assistance
d) Corpse Disposal
e) Medical
f) Epidemics
g) Salvage
h) Deployment of Resources
i) Outside Relief
j) Camp-work and Employment
k) Fire Fighting
l) Information

ANNEXURE 4B

DISTRICT CONTINGENCY PLAN

CYCLONE

ACTION POINTS

1. Action after the first warning -

The Collector should ensure -

i) That sufficient stock of foodgrains, kerosene and other dry food commodities are available for distribution to the victims.

ii) That Medical and Veterinary Departments are fully equipped with required Drugs and Vaccines for taking preventive steps after cyclone and to arrest the spread of epidemics.

iii) That all the Government vehicles are kept in road-worthy condition for putting them to use in the emergency.

iv) That a list of generators available with the Cinema Theatres and other undertakings is maintained by the Officials of State Electricity Board and advance action taken immediately to procure them when necessity arises.

v) That action is taken for opening of cyclone stores for providing the following material.

(1) Hooks of the type available with the Fire Service Department for cleaning debris

(2) Rubber tyres and tubes for using as floats in water.

(3) Tents.

(4) Kerosene lanterns.

(5) Large cooking vessels for use in relief camps.

(6) Identity slips to be issued to be victims in relief camps.

(7) Copies of maps, etc.

(8) Ropes, wires, chanins, lights with wire fittings, lead wires, torches, etc.

(9) Spare Road Market Stores, Steel poles, Bamboos, G.C. Sheets and Slotted Stripes of metal (to be laid on churned up road surface for better transportation).

(10) Double handle shows (for cutting fallen trees), Shovels, Candles, Land Hailers, Hose pipes, first aid kits, cyclone duty sign Boards, Ropes, Asbestos, sheets Torch lights, Jetty, cans, empty oil drums, gunny bags and sand bags, polythene bags (for dropping supplies), buckets, V.H.F. sets with

(11) Fodders, pumps for bailing out water alongwith hose spades, crow bars, hand gloves, Eucalyptus oil, napathalene balls, bamboo mats, phenyle slate line, etc., useful for burying dead bodies.

2. ACTION AFTER RECEIPT OF THE SECOND WARNING (ACTUAL THREAT)

(i) Evacuation

(ii) Relief to Stranded persons.

(iii) Stoppage of traffic on National Highways

(iv) Stock of foodgrains

(v) Declaration of local holiday to the Educational institutions

3. POST-CYCLONE MEASURES

(i) Convening of the meetings of the Committees

(ii) Rescue Operations.

(iii) Removal of dead bodies and carcases.

(iv) Health Measures.

(v) Restoration of traffic

(vi) Adequate number of mobile squads shall also be made available by the Police Department for helping clearing the fallen trees, etc.

(vii) Electricity Board should clear the roads of fallen electric poles and restore power supply as quickly as possible.

(viii) The Public Relations Department must ensure to build up photographic record of the damage simultaneously, using services of the local Officers or by employing local men

(ix) Immediately after the cyclone, the Divisional Revenue officers should form required number of teams to assess damage to the houses, crops, loss of human lives, livestock etc.

ANNEXURE-4D

DISTRICT CONTINGENCY PLAN

DROUGHT

ACTION POINTS:

I. EARLY WARNING SYSTEM.

II. CONTINGENCY PLANNING FOR AGRICULTURE.

i) Crop life saving measures.

ii) The alternative cropping strategy.

iii) Compensatory Cropping Programme.

iv) Supply of Inputs.

v) Provision for irrigation.

vi) Supply of Power.

III. DRINKING WATER:

i) A detailed contingency plan for supply of drinking water in rural areas to be formulated with technical help from the Central Ground Water Board(CGWB) and utilising if need be, the rigs and other capital equipment from the CGWB.

ii) Made adequate plans to supply drinking water in urban areas through bores, tanker special trains and other suitable measures.

iii) Monitor continuously rural and urban drinking water availability in drought affected areas.

WATER RESOURCES:

i) Prepare a water budget for each irrigation reservoir covering drinking water, kharif and rabi requirements and evaporation losses, after working out a trade-off between kharif and rabi benefits from the available water.

ii) Undertake repairs of tubewells to make all tubewells operational and install additional tubewells taking care at the same time to prevent over-exploitation of and damage to ground water regime.

iii) Regulate supply to water-intensive industries, if necessary.

iv) Minimise evaporation losses in tanks and small reservoirs by using chemical evaporants

EMPLOYMENT GENERATION:

(i) Adequate scarcity relief works to be taken up to generate the required employment.

(ii) The funds available under employment generation scheme like J.R.Y., and scarcity relief etc. should be devetailed and integrated.

(iii) Shelf of projects should be kept ready to be taken up for employment generation during drought.

(iv) Drought-proofing schemes to be identified and to be given higher priority.

PUBLIC HEALTH:

(i) Disinfect drinking water sources to prevent the spread of water-borne diseases.

(ii) draw up plans to cope with likely epidemics.

(iii) constant surveillance of public health measures including immunisation to be undertaken.

WOMEN AND CHILDREN:

(i) The nutritional requirements of all the children, expectant mothers and nursing mothers should be taken care of.

IV. FODDER:

(i) Assess fodder requirement in drought affected districts and locate areas where shortages are likely to occur and arrange for supplies from outside.

(ii) Monitoring the prices of fodder in selected places/markets.

(iii) Arrange to procure fodder from surplu. States.

(iv) State Forest Departments to arrange for the cutting and bailing of grasses in the forests, wherever possible to meet the demand from fodder deficit districts.

(v) Fodder cultivation to be encouraged wherever feasible.

(vi) Ensure supply of molasses to cattle feed plants.

(vii) Obtain from NDDB and other sources premixed feed and urea-molasses-bricks to the extent necessary.