8.1 Introduction

Natural disasters place enormous and extraordinary burdens on the people who experience them. Individuals and private organizations are often unable to cope with the stresses and strains of events like hurricanes, earthquakes, and floods. Therefore, people turn naturally to government for assistance. However, disasters generate problems that are often difficult to anticipate and handle. As a result, the effectiveness of governmental efforts in this area has been highly variable. In some situations, the government appears to respond with speed and urgency. At other times, its efforts seem to be slow, ineffective, and misguided. This raises an important question: Why are some governmental disaster relief efforts perceived to be successful, while others are widely believed to be failures (Schneider, 1992)?

In the Indian Government structure, the emergency & disaster response system is dominated by bureaucratic procedures, norms and values. These norms and values are interfaced with the citizens through a multi-level administrative structure, represented by the “domain managers or officials” (For the purposes of this research, “Domain managers” are defined as those Government officials who played an active role during the earthquake disaster. Such domain managers have been classified into three broad categories viz. Policy level officials, Supervisory officials and field level action executing officials). The exact nature and characteristics of the administrative structure varies from one analyst to the next (Down, 1966). However, four of the most common bureaucratic properties are: (1) clearly defined objectives; (2) a formal structure underlying the process and linking together the various component organizations; (3) a division of labor; and (4) a set of policies and procedures guiding organizational activity (McLoughlm, 1985). On paper, at least, the governmental system for responding to natural disasters conforms precisely to these bureaucratic characteristics. This chapter presents analysis of the
“Domain Managers’ ” feedback on the existing norms and values guiding disaster management in the state which, inter alia, brings forth the impact that procedures, policies and organisation had created on the management of 26th Jan 2001 earthquake in the state of Gujarat. Government system still works in a “conservative mode” and access to these domain managers for any one from outside the Governmental system would be next to impossible. This Chapter presents a very important insider’s view on – how the state Government of Gujarat reacted to the emergency and disaster management work during the 26th Jan 2001 earthquake.

The insights gained from these in-depth interviews are in many ways richer and more relevant than the impersonal, numerical data garnered through questionnaire surveys and secondary data. Hence the chapter is quite significant and useful. The narration below paraphrases what was said and described during the interviews. Occasionally direct quotes from the interviews are also given.

8.2 Disaster Management & Domain Managers in Gujarat State

There was no permanent, formal structure of the disaster management organization / agency at Local or state (Gujarat State) or at the national level at the time of 26th Jan 2001 earthquake. State Revenue department, traditionally, was assigned additional responsibility to handle post-disaster management work due to the department’s state-wide spread and reach. A Revenue Dept. officer namely the District Collector (DC) and his subordinate officers are responsible for overall administration of the district and have the strongest linkages with the local citizens through their various administrative units. Revenue secretary would act as Relief commissioner (in some cases the relief commissioner is another officer of the rank of secretary) during emergency and function through Director (Relief). Officials from different departments (PWD, Police, Forest, Health, Education, Irrigation, etc...) would be called upon during a disaster to assist in overall management of the situation. Revenue Control Room would be activated during the monsoon period (June-Sept) or through SOS during disasters or emergency situations to augment its operation.

A typical composition of the sub-system earmarked for disaster management activities within Government system at the time of 26th Jan 2001 earthquake was as given below :-
Sub-system -

Organisation at State HQ level:
- Commissioner relief (Temporary ad-hoc role which gets activated at the time of emergency)
- Director (Relief) – permanent post under Revenue department with some skeleton staff doing preparedness work through the year
- Director (Volunteer organization) – under Director (Relief) keeps liaison with all volunteer organizations in the state.

Organisation at District HQ Level
- District Collector and District Magistrate
- Sub Divisional officer

Organisation at Taluka / Tehasil level:
- Mamlatdar / Deputy Mamlatdar (Taluka level)

Organisation below Taluka level:
- Circle officers (Village level)
- Talati (village level)

The state had disaster management plans for Flood, Cyclone and Drought to some extent. Chief Secretary of the state (who headed the disaster preparedness / coordination committee) would convene joint meetings to take stock of the overall preparedness of the state before commencement of monsoon and cyclone season, in which representatives from external agencies beside the state Government’s internal departments - viz- Defense, Meteorological department, Central Water Commission would be called. The committee would review the preparations for the monsoon – like information exchange with the external organizations (Indian Meteorological Department, Central Water Commission, Defense, Light House, Railways, and All India Radio),
status of connectivity to various dams, rivers and reservoirs, readiness of external agencies to support any event of emergency etc.

Irrationally as a strategy - mitigating or preventing a disaster from occurring in the first place - was missing from the disaster management agenda and all advance preparations or meetings would focus on strategies for reacting post-facto to any unforeseen emergency situation in the state.

**Purpose of the Domain Manager Analysis** is to capture first-hand insights on the adequacy of disaster management policies, procedures and organizational preparedness in Gujarat State at the time of the Bhuj earthquake. The analysis is also expected to sense if the disaster situation has produced “newly emergent norms” which are different from previously existing bureaucratic policies and processes. Government systems in India still work under a strict hierarchy. The rigidity increases with the seniority and ranking / level of the officials. For example, hierarchical rigidity will be more prominent and strict amongst highest ranking officials (Secretaries and above) compared to the officials at lower strata (Mamlatdar etc). A flexible approach was adopted while conducting interactions (in-depth interviews) with the Domain Managers to avoid conflicts related to protocols, government confidentiality, and other sensitive issues. This was, of course, a challenging task.

Domain (Disaster) management system is segregated into three main categories in Governmental hierarchy, keeping subject matter (Disaster management) into consideration.

**Category I** – Policy-level. Planning & Decision making - consisted of Senior Officers from the Revenue Department responsible for disaster management in the state. These are the officers from Indian Administrative Services (IAS) and usually head the department responsible for policy development and its management. Revenue department hold Contingency Relief Funds (CRF) allocated and issued by the Government of India to be used for disaster and its management related activities.
Category II consisted of District Collectors, Deputy Collectors & equivalent ranking officers. These officers usually head Districts and sub-divisions and act as incident commanders during emergencies anywhere under their jurisdiction.

Category III consists of Mamlatdar / Dy Mamlatdar and other associates. These officers are the key strength in the Government functioning and discharge field-level revenue functions in the state Government.

**Table 8.1: Respondent Sample Distribution**

<table>
<thead>
<tr>
<th>Group</th>
<th>Participation / Size</th>
<th>Rank / Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category I</td>
<td>Two Groups and total respondents 6</td>
<td>Chief Secretary / Additional Chief Secretary / Principal Secretary / Secretary of the state/ Technology Expert/Advisor</td>
</tr>
<tr>
<td>Category II</td>
<td>Three groups and total respondents 10</td>
<td>Additional Secretary / Joint Secretary / Dy Secretary / District collector / Deputy Collector</td>
</tr>
<tr>
<td>Category-III</td>
<td>Three groups and total respondents 12</td>
<td>Mamlatdar / Dy Mamlatdar</td>
</tr>
</tbody>
</table>

Following is the outcome of the in-depth interviews with the domain managers in each of the categories defined above.

### 8.3 Domain Manager’s Response

In the following segment of this chapter, almost a direct transcript of select in-depth interviews is being provided to convey the richness of insights in disaster management. In the end of each category’s response transcript, the findings are listed. Towards the end of the chapter these findings are re-considered and then critically examined to provide relevant guidelines for the design of an emerging disaster management system.
Response Summary category-I (Domain Managers from Gujarat State)

Disaster Management Organisation & Plan

- Disaster management organizational structure in Gujarat state at the time of Earthquake on 26 January 2001 was -
  - Commissioner relief (Temporary post get activated at the time of emergency)
  - Director (Relief) – permanent post under revenue department with some skeleton staff doing preparedness work through the year
  - Director (Volunteer organization) – under Director (Relief) keeps liaison with all volunteer organizations in the state
  - District Collector and District Magistrate
  - Sub Divisional officer
  - Mamlatdar (Taluka level)
  - Circle officers (Village level)
  - Talati (Village level)

- Traditionally, disaster management and emergency response work has been handled by the revenue department due to its well defined and deep reach unto the village level. The system was in force for 30-40 years, i.e. since the inception of the state.

- Revenue department was involved in the disaster management works due to its deeper penetration in the state;

- Gujarat state is the first state in the country to have a position of Director (Volunteer Agencies) responsible for coordination between VA – Gov – Public during the time of need.
• State had DMP for flood, cyclone, draught and scarcity to some extent. But these Emergency Response Plan (ERP) were capable to operate only for a short while.

Organizational and other Limitations

• Earthquake struck without any warning and hence no advance preparation could be done. However, the traditional disaster management structure got into action spontaneously. This was a massive disaster and state had no experience of handling such an incident. In addition, major bottlenecks, which worked as a retarding force in the way of relief operation included –
  ■ Communication black out
  ■ Absence of resources to meet such a huge calamity –
  ■ Established chain of command without relevant powers – District Collector (DC) or District Magistrate is considered as model authority in the district and to great an extent people obey this model authority. Except model authority Collector did not have any legislative powers conferred on him empowering him to take control of resources belonging to Government/Public or Corporate in the area for emergency response.
  ■ Short time support capability of Collector’s organization: Existing organizational structure of Collector was capable of handling emergencies for couple of days and not for prolonged period as they are responsible to public for so many other matters and must do their regular day to day work concurrent to DM. Collector’s administrative hierarchy can not afford to remain away from their day to day work for long, otherwise it will create another disaster with far reaching consequences.

• Managerial Structure started failing miserably after the third day of the disaster, as all players were only part-time at the scene of action. District Collector’s office
had to discharge its regular duties even at the time of disaster. The typical emergency management on time scale at district level would be -

- First day of disaster - Demand for public works would be minimal or zero and managerial organizational resources can be 100 % devoted to DM
- Second day of disaster - Public works start generating and some distraction takes place in DM
- Third... forth and subsequent days .... The public demand for various other services would go on increasing; leaving no time for managerial organization of district collector to spend on DM. Effectiveness, of course went down with passage of days.

- DM efforts would erode in the absence of a permanent structure which can sustain long term operation.

- Instantaneous decisions were taken to strengthen the Director (Relief)'s office and creation of a separate disaster management authority, which were capable to offer long term sustainability. But this was a futuristic step and it was too late to handle the current disaster at that point of time.

Resources

- Government was not prepared for such a huge disaster. They did not have adequate resources and supply to cope with the demand generated out of colossal damages and losses. Nothing could happen without supplies and resources and the first day went just in identification and transportation of resources. This included heavy earth movers, gas cutters, trained manpower, other equipments for lifting debris and rescuing people, temporary shelters etc. Organizational effectiveness started going down as no field work could be done. Communication black out was another hindrance in inventory & mobilization management.
• Public Preparedness: Nothing existed for community capacity building.

• Building / construction codes for seismic zones: No building code existed on the day of earthquake and people used to construct the buildings the way they wanted. There was neither code nor any enforcement of any such control on the building. It is said that – “Earthquake does not kill; these are poor buildings which kill most of the people during any earthquake”.

• Good support from NGO: Gujarat state was fortunate to have a very strong Volunteer base, like strong cooperative sector. NGO did very good relief work and mobilization was quicker and faster.

Coordination during the earthquake

• Coordination within Government - It was very effective within what ever resource limitation we were performing.

• Coordination with Government of India – The coordination with the Government of India was very poor due to various reasons and we were dependent on multiple ministries like - Petroleum, Telecom, and Transport etc... For various support services.

• Coordination with aid agencies from out of the state/country – the coordination was poor as most of the agencies were not acquainted with the geographic a demographic characteristics of Bhuj and other affected area and they needed navigational and other support from the Government who was already under extreme human resource strain.

• Coordination with NGO (particularly local) – the coordination was very effective.
Coordination with Private companies and Corporate - the coordination was good.

Relief supplies (Unsolicited Supplies add problems in relief efforts during emergency)

- Goodwill and humanitarian consideration are globally prevalent. Common people, NGOs, Governments from all over the world would rush supplies as relief aid in any disaster affected area. While we must appreciate their goodwill gesture, but unwanted supplies create huge logistics problems, starting from parking and down loading of aircraft or other carriers to the storage and disposal of supplies. Majority of productive and precious time of Government machinery was consumed in the management of relief aids arriving from all over the world during 26th Jan Earthquake at Bhuj. Gujarat is traditionally very strong in pharmaceutical industry. We had lots of the medical supplies and we did not need any thing to come from out side. Still we received a huge consignment of medical supplies.

- This is important that all relief supplies are regulated through the relief supply exchange counter (RSEC) capable of assessing the demands in the affected area and guiding accordingly all agencies interested in sending the consignments. This mechanism could even provide the exact destinations for each supply enabling donors to mail shipment directly, which will reduce the response time.

- Emergencies do not permit any relaxation on time scale and if not attended immediately will result into deaths and destructions. All resources required need to be managed with the highest skill with minimal number store and forward locations between the donor and receiver.

People and their characteristics
- Earlier days - People were not too much dependent on the Government and used to take their own decisions, e.g. how to ascertain danger markings during the
flood situation and when to leave the village or town. Government directives were not generally followed.

- No one wants to leave their home, even if it is broken / collapsed and not worthy of staying there. Attachment and belongingness of the place, property and other personal paraphernalia sometime mask the hidden risks. Of course, people did leave their homes and stayed in the protected shelters during the bloody incidents of communal riots in Rakhial, Ahmedabad (Gujarat). This attitude might have come out of the compulsive requirement of “group strength” during such emergencies or hazards!! During natural calamities, this hypothesis does not hold good and people, even after repeated warnings, do not volunteer to leave their premises. Communities in some of the affected area decided to go to shelters / tents after few days as after shocks did not stop.

Earthquake and Health Infrastructure:

- Each disaster characteristically affects the health infrastructures differently and also demand for health services generated out of each disaster is different. Earthquake does not recognize the ownership of the buildings and will raze to the ground all poor structures including hospitals, pharmacies etc. Majority of doctors and patients died when the Government hospital building collapsed due to earthquake in Bhuj. There was not a single health service facility left intact to handle the kind of health services required. Primary health care could not treat people with shattered bones, and separated limbs.

- It took time before we could establish temporary hospital and temporary operation theater to handle surgeries locally. Most of the patients were transported to other places.

NGOs

- Gujarat state had excellent NGOs. They were real non-profit social workers or agencies and Gujarat was fortunate to have many of them.
• Earlier days NGOs were – Extremely motivated, deeply involved with clarity of objectives and curiosity to serve, save and help people using what every resources they had. No one use to run after name or fame or media coverage. They will just work, under the command or without a commander. May be the presence of Gandhian effect is slowly fading out and we do not see must of the motivated NGOs. May be NGOs have become an organized industry.

Emergency Managers

• Emergency & Disaster Management may not appear on the agenda for the district collector as there are other pressing priorities.

• Energies, willingness and inclination to work in emergency response, training and high level of integrity and morality are some of the pre-qualifications for an Incident Commander or emergency manager.

• Public complaints, inquiries and investigation in the aftermath of disaster are major de-motivating factors for Domain managers. Emergency response works should be exempted from critical finial audit and the purview of the vigilance commission. This is important as many a times the leader has to take situation decisions to save life and property, even if he requires deviating from the general financial rules or norms. This relaxation shall motivate real player to come forward and do best of their capabilities.

Information and Communication Technology (ICT)

• It was around 0900 AM and the environment was dead silent in the revenue control room at Gandhinagar. There were 2-3 officers, including Principal Secretary (Revenue) present in the control room. All communication linkages with Bhuj District were out of order and it was decided to urgently establish communication with Bhuj District Collector on satellite Phone. Directives were
issued to be activated by extending adequate telephone and data lines at all call desks.

• Fortunately, while working on a modernization project (Secretariat Integrated Communication Network) in the year 1999, Information Technology department (Government of Gujarat) had procured 30 numbers of satellite phones (Inmarsat). Each district collector was given a satellite phone and four sets were kept at in reserve for VIPs in secretariat for use during any emergency. All executive officers from the district as well as at Secretariat were given adequate operational training on these satellite phones.

Figure 8.1: Scenario at Secretariat, State Capital Gandhinagar just after the Bhuj Earthquake

283
The satellite phone was deployed but communication with Bhuj district collector could not be established for an hour or so. First contact with the Bhuj district could be established at around 0950-1000 AM, about an hour after the earthquake struck. People not trained on the use of satellite phone did face some difficulties due to inherent time delay in reception. The anxiety was another factor which contributed to garbled messages in the beginning. To avoid any confusion and misinterpretation – it was decided to connect satellite phone with fax machine and all important messages should be sent by fax instead giving oral dictation to the dispatcher in the control room. This proved a great success.

Public Switched Telecom Network (PSTN) was choked and there was a telecommunication black-out for many hours throughout the state due to network saturation. Crisis calling had overloaded cellular as well as PSTN through the state.

SICN proved very useful as all Government buildings/offices and VIP residential area (minister’s enclave and secretaries house) in the capital city were connected with state-owned EPABX which was immune to congestion on public switched network. There was no dependency on public telecom system as far as internal communication was concerned.

Department of Telecom (DoT) was requested for assigning priority to couple of E1 trunk circuits (we had 10 E1s) terminating on EPABX for connectivity with external networks and keep them up so as coordination with external agencies can be done. Within couple of hours we had control room up and working with about 10 dispatchers. Telephone numbers for emergency control room were announced through TV and radio broadcasting.

District Collector Bhuj was connected with Secretariat on the upstream on
satellite phone with, practically, no connectivity with Taluka and other government offices at the downstream under his jurisdiction. There was no way – district collectorate could know about the losses and damages in the rural areas as telephone networks were out of order and roads were either damaged or access was blocked by debris. Mamlatdar from Bhachau taluka managed to come to Bhuj around 10.30 AM and apprised on the situation there.

- Satellite phone was the lone communication link between secretariat and Bhuj district. But the district collector Bhuj had no mean to contact taluka (as Taluka had no satellite phones) under his jurisdiction and know about the extent of losses and their immediate needs. There was no tool / mechanism available with either Secretariat (revenue control room at Gandhinagar) or district collector to undertake “loss and need assessment” in the affected area which was wide spread. Government constituted 226 teams for assessment of loss and damages on 27th January, but it was not an easy task to reach remote location and accomplish task.

- Telecommunication & hence information blackout was causing stress not only to the administration but to common men who had some one there in the affected area. People from all around the world were worried and wanted to know about the welfare of their kin’s/relatives that were there in the affected area. In absence of information and communication they would ask friend / acquaintance, living in and around Gandhinagar/Ahmedabad, to go personally to secretariat control room for getting any clue. It was unimaginable – dispatchers had nothing to convey to the complainants and they were absolutely at the receiving end.

- To ease the situation, it was decided to deploy one operator with a satellite phone out side the emergency control room in the secretariat compound for limited public use. State Government was trying hard but many things were beyond its control.

- Things started getting tougher and tougher with influx of delegates from foreign
countries, NGOs, neighbouring state and individuals who wanted to extend helps and supplies. Continuous inflow without any outlet started adding stress to system which was already under tremendous stress. There were no procedures to handle such situation and for every unique activity decision makers would improvise method/process/procedure. Segregation of work was done based on – attending to foreign Governments/ embassies, NGOs (Foreign/national/Local), supply management at different location starting from Ahmedabad airport etc., and senior officials were assigned to each task. There were some of the best bureaucrats at the helm of affair but absence of appropriate/adequate norms/procedures/processes and practices for handling holocaust causes by the massive earthquake were posing insurmountable hindrances. All operation management was through one-one briefing in most of the cases.

- Situation at District Collectorate Bhuj was even worst as their resources got severely impacted by the earthquake. With a total communication black out with external world, no electricity and damaged government resources it was a nightmare for district administration to assess and extend relief to the citizens in initial few hours which were most critical. District administration had no planned system for accessing and communicating to the public concentrated in different area of Bhuj. There were no mean for assessing and exchanging information on losses and relief. Tents hired for parade ground (26th January Parade ceremony) were shifted to Jubilee ground and a makeshift medical assistance facility was started by the district administration. District hospital at Bhuj was completely destroyed and 193 people, including 11 staff members (doctors and nurses) died got buried under the debris.

- Absence of telecommunication facility was causing sever stress to the common men in the affected area. State police wireless network, which could be revived by the late afternoon, network was point-to-point confined to Government offices or police station and lone satellite phone with district administration was in continuous used for communication with secretariat and other external agencies.

286
There was no facility available for public to communicate on the first day of the earthquake.

- During subsequent days – two VSAT stations were installed (one at Bhuj and another at Bhachau) with PSTM system interfaced at other end and public was allowed to make calls to their relatives, near and dear.

- Point-to-point thin communication channels, without any portability (one had to go to base for making a call) was impeding relief measures. It was very crucial to have flexible and mobile communication facility with all Domain Managers working at the sites of incident. Information Technology department, Government of Gujarat, persuaded a major cellular service provider in the state to install temporary repeater station at Bhachau to extend mobile telephone services. This spontaneously helped in improving effectiveness and efficiency of operation.

- Management of relief supply inventories, which started coming in starting from second day, was another critical issue. One needs knowledge from affected area on type of needs and priorities for organizing relief supply dispatch and distribution management. State had no standardized norms or system for crisis information & inventory management (CIIMS). Management of unsolicited supplies and services resulted into wastage of hundreds of man-hours of critical government human resources.
Day 2 of the Earthquake onward - Revenue control room was bursting with the visitors from all over the world. There was a chaos all around. Communities, religious agencies, individuals, local NGOs, national NGOs, international NGOs, international aid agencies, diplomats, inter-governmental agencies, friends and relatives of the people in the affected area, media and press corporations.

Figure 8.2: Incident Scenario from day two onwards

- Government received some telecommunication equipments – 2 Mb microwave links and about hundred VHF walky-talky’s. But communication systems cannot be used as commodities during emergencies. Such systems need site surveys, masts, earthing, and power supplies. Regulatory approvals etc. However, we tried to use the VHF for local communication at Rapar, Bhuj and Anjar.

Gujarat State Wide Area Network (GSWAN) services at Bhuj and Taluka under its jurisdiction was out of function due to (1) damaged DOC (district operation center) buildings and (2) backbone provided by DoT was not available. But GSWAN played a catalytic role for overall coordination and management in the post-disaster phase when the voice, video and data communication services were restored.
Response – Category I (Domain Manager from Andhra Pradesh)

- Poverty and the Impact of disaster have a horrible positive correlation. and there has become a positive feedback system established between the “poverty and eco-system” regenerating disaster. Poor men ignore the ecosystem for satisfying his needs for survival inducing dangerous impact to the ecology as whole. This in turn gives birth to the disasters impacting more to the poor and the cycle repeats.

- Technology can do miracle in the disaster mitigation and we could handle recent draught effectively because of availability of modern innovations and information system.

- Disaster preparedness is different for different place. For example the Ratnagiri district of AP has a distinction from other districts due to so many reasons.

- Earlier day people on the coastal area will not cooperate with the administration, even when the cyclone warnings had been issued. They will not even agree to the suggestion and persuasion of the local administration for shifting to safer locations. Reasons were many and some of these were –
  - Poor fisherman always get tempted to have big catches from wield and turbulent sea during cyclone;
  - They were worried to leave behind what ever their belongings use to be. Theft and encroachment on their land use to be hidden fear in the minds and heart of fishermen living on the coastal area;
  - Some time, even after warnings the cyclone will not hit there area. This created distrust in the Government forecasting and fishermen will avoid shifting to the shelters.

- Things have undergone transformation. People cooperate us when local administration approaches them for re-location during expected threats...
reasons behind this are -

- Government has better and reliable forecast system now.
- There is realization amongst fishermen on the repercussions of not shifting to safer locations;
- They have acquired confidence on the local administration that their belongings and property will remain safe when they are away. Confidence in the Governance in one most important factor.
- Time has changed and the current globalization has, even, given disaster a global definition. Disasters have already become Global in characteristics and any mitigation plan should be designed keeping the global perspective into consideration.

Findings – Domain Manager Category I

- State did not have Emergency Response Plan (ERP) capable of handling magnitude of devastation caused by Bhuj earthquake. Available ERP were design for managing short term emergencies caused by Cyclone, Flood and Draughts in the state.

- Neither State Government nor the community was “Prepared” to handle catastrophe from any angle.

- There was no technology supported “Crisis Information and Inventory Management System (CIIMS)”. “Needs and Supply: management was purely based on manual system.

- There was no “assured stock of inventories” useful in earthquake management.

- There was no GIS based model available for simulating the situation to arrive at estimation on losses in the affected area.
• Government did not have communication linkages with the affected area when they were needed most. Absence of emergency communication system posed the biggest hindrance in overall disaster management.

• State owned ICT infrastructure proved very useful. Official could communicate on their CUG (Close User Group) network with in Gandhinagar when PSTN systems were totally down.

• Satellite phone could have been put into use more effectively had it been kept in the car or district collector. Operational training on emergency communication equipments should be given to all cadres, including ministers.

• Data communication proved more effective than the voice communication during disasters due to inherent clarity.

• Communication equipments/system Donation is useful if donor is willing to supply and install them in the affected area. Government may not have resources for installation and commissioning during emergencies.

• There was no permanent structure for emergency and disaster management in the state which can sustain long term operation.

• No construction code or regulation commensurating with the seismic zones existed in the state of Gujarat at the time of earthquake.

• Coordination within State Government was excellent, but difficulties were encountered while interacting with multiple ministries (Petroleum, Telecom, Transport etc.) in Government of India. There was no “single window” interface available between States and central at that point of time.
• Coordination with interstate and international aid agencies was also not very effective due to barriers like - in-acquaintance with the geography, language and culture prevalent in the affected area.

• Government did not have technology based effective relief information and inventory management system and inflow of unsolicited supplies was adding fuel to fire. Supplies should be based on "need assessment" should be filtered way down at the central or state HQ, to avoid additional stress on the managerial structure during emergencies.

• Government did not have any portable hospital facility and people could not be attended/given required medical care when and where it was needed most.

Response from Category-II (Managers /Supervisor/Incident Commanders in Bhuj District)

Earthquake scenario at Bhuj District

• The district collector’s office building was half broken and hanging. It was dangerous situation. There was no any communication mean and the satellite phone was inside the office cupboard. No one could dare to go inside the building as we were afraid of the further shocks and collapse of building. Earth was emitting constant grinding noise.

• Somehow, one person dared and we installed satellite phone at 09:45 AM and established first contact with the secretariat, Gandhinagar.

• There was no specific DMP for earthquake. State had two manuals – called flood memorandum and the scarcity manual. The state had also cyclone memorandum and related DMP.
• Collector did activate the cyclone relief plan during the earthquake.

• Local People started collecting in the office premises with their personnel grievances and most of these were that they have their relative buried in debris and want some help to take him or her out, or they have some one seriously injured and need medical assistance.

• Teams were sent to all areas for assessment. It took time to receive first information report from the various hierarchal committees.

• The district collector has is responsible for emergency response. But his powers were limited for procuring and mobilize resources.

• Collector was responsible for making all decisions and he was traumatized. There was no provision for any one else to take decision except the district collector. Additional Collectors and DC were, of course, working.

• At 10:30 AM Mamlatdar (Bhachau) came in his jeep and informed that whole Taluka had been grounded and there is not a single house left. Police station has been destroyed and probably the inspector on duty is buried in the debris.

• One of the press reporter suggested making public announcement on the medical and other aids.

• District hospital was grounded and most of patients and doctors in there were killed.

• Stop gap arrangement for medical treatment to injure was made in the jubilee ground. We could arrange shelters by using same tents used for flag hoisting.
• Announcement was made about the medical relief available in jubilee ground.

• Dead bodies started coming in next moment and most of the carriers were relatives and neighbors.

• By 12:00 Hrs we were out of small inventory of medication. We forced some of the medical shops open and took whatever they had inside.

• 1400 Hrs police wireless control room was made operational.

• But by 1600 Hrs even whatever medicines were in town were exhausted. We communicated to someone in Bombay and Delhi on satellite phone for medication and other immediate relief material.

• It was possible to start only primary health care services in a limited way at the jubilee center as it was not possible to undertake surgery on the open air. We were managing to send the patients to out stations in the nearby districts.

• Some special ST buses were pressed into service for taking injured to neighboring districts.

• Many of ST drivers had taken the buses to their home to shelter their family inside as the after shocks were continued. This was difficult task to mobilize the buses and drivers for transporting serious injured patients.

• Local Army sustained huge casualties and were shocked and busy in their internal relief works.
• There were no bulldozers and excavators available for removing debris and taking buried people out.

• District Superintendent of police was asked to coordinate the rescue operation.

• By midnight we had 200 bodies in jubilee ground. Local photographer was hired to take photo of each dead body and allowed relatives to take the body for cremation. But then photo roll got exhausted quickly.

• First day was planned but from second day officers started coming in there was a chaos. First day... was just to activate the manual which was with well defined guide lines. Manual had a list of NGO, formation of committees, work and responsibilities of the committees etc. This got activated and reports started coming in. From second day - collector was finding difficulty in taking any decision; he was not even signing paper! It was difficult to work for special officers deployed from the state HQ. It was decided to divide Bhuj into two zones for better control and management. Zone I constituted area falling under municipal limit and Zone II was comprised of rest of the area. The work was divided between the district collector and the special officer. Same was affected under the order from the third day.

• A team from Turkey arrived next day, i.e. Jan 27th 2001.

• Supplies started coming in at the Bhuj airport, but we did not have people to unload and manage supplies. Central Industrial Security Force (CISF) posted at Bhuj Airport helped in unloading the supplies from the parked aircrafts.

• Regional Transport Officer (RTO) was told to handle the unloading and dispatch of supplies at the Bhuj airport.
• Unloading / Loading and dispatching the supplies received from various modes kept every one busy on the third day.

• District Development Officer (DDO) was made responsible for managing the relief material.

• Tents and blankets started proving useful as more and more people opted to come into shelters than living in their damaged houses from second day onwards due to aftershocks and other concerns.

**General Observations**

• Last dead body was recovered on the 43rd day after the earthquake.

• 80% of the rescue work was done by the relatives and neighbors.

• Free State transport services for people coming into and going out of the Bhuj proved a wrong decision as so many unwanted people from neighboring states and towns got into the torn town for taking relief supplies.

• District Collector (DC) was replaced on the 3rd day of the earthquake due to various reasons.

• DC was changed second time after couple of months.

• Distribution given to the private agencies and NGO proved very dangerous as many of the important supplies were either misused or mishandled. A water softening plan donated was found in pieces from various filed after several days.

• If distribution is given to the local leading personnel from community, it can produce better results than entrusting NGO and others.
• There was acute need of laborers and smaller vehicles which could be driven to the small passages in the earthquake struck area. There were debris everywhere and we needed smaller vehicles which can move on smaller trails.

• Effectiveness of management degraded from second and third day as there were so many commanders and very few workers.

• About 12000 people died and 0.3 million families affected in Bhuj

Learning from an real time experience – a novel communication channel for damage assessment

• During one of the disaster incident in a particular area, I was deployed. I reached late night there and was unable to reach the point of incident and do damage assessment. I had no means for communication, no navigation and no one to talk with to know about the status of damage and losses in the area!

• I decided to go to nearest milk collection center (cooperative milk collection centers are places where all villagers come and deliver their daily milk collection) in the early hours next day (0400 Hrs), as I know people from all around from the neighboring villages will come to deliver the milk and they should be able to given me the information on the status of their village. This proved very useful as within no time I could gather enough information to assess situation in surrounding with relative gravity of impact on the villages in the affected area.

Some other observations made by the Domain Managers posted at Taluka Places (Notified as special districts during earthquake) are summarized as below
Coordination work

• All agencies were working hand in hand, even without any manual or drafted coordination procedures. Every one agency present at the point of incidence intends to work and help affected people. Some time the relief agencies would compete with each other and try to do more then their capacities and allocations and that created some turbulence.

Government Orders

• Absence of Government orders for regulating aid works proved as blessing then a short coming as this gave freedom to the special collectors to take situation decisions as needed. This is important to understand that situation changes rapidly just after the incidence and you are required to take decisions in order to best match the evolving situation. Generic orders some time poses hindrance in relief operation. First Government order with guidelines to handle emergency after ten days of the incidence.

• Realistic and optimal systems proves more productive then idealistic and over specified system for handling emergencies

Human Resource management

• Majority of district collector’s time was spent in meeting people. Hundreds of affected people will come to my office for various reasons. On an average, about 500-600 people would visit special collector every day. Incident commander must be a good PR person. People are in problem and they want some one to hear them and give assurance. People have lost all they had and they are in a phase of uncertainty about what will happen in future. No one had seen such a calamity where every thing was gone.
• Experience is most important - while handling emergency response.

• Team of the officers acquainted with the calamity and area of incident will prove more effective in managing emergency response.

• Enough Work force need to be created for deployment during Emergency Response (ER) so as people can be rotated. People in such work force should have prior interactions and group exercises facilitating mutual knowledge and understanding of each other. Working in group of known people during emergency response would produce effective results.

• Deployment should follow a systemic approach and officials should under go briefing / debriefing as needed.

Relief Supplies

• Government decided to accept aid calls from social institutions, corporations, and other agencies from within and outside the country... With good knowledge on length and breadth (spread) of earthquake the authorities at the state capital were eager to accept donations and supplies, but there was no time and human resources for planning inventory management. Supplies started pouring in and so the visitors. Crucial time went in arranging and facilitating visitors and suppliers with the logistics and basic arrangements. Unsolicited aids disrupt the critical emergency management service.

• Distribution of the relief supplies was one of the toughest tasks and often invites controversies as no one can satisfy the unrealistic demands (tinted with human greed) people. Governments generally take shelter of the NGO to avoid public controversies who acts as interface between the affected people and Government’s coffers.
Typically in this case, there were some major samajs (communities based on cast) and it was advised that each of the samaj would nominate one leader who will handle relief supply distribution. With ten samajs (viz- Patel, Koli, Darbar, Brhamm etc) identified, Government was to interact with ten people who will come with their requirements and supplies would be delivered to them from the store handled by NGO on receipt of the Government recommendation. Government avoided interaction with individual family and this resulted into distribution task far easier, impartial and less time consuming. Community divide aspect will have to be looked into, but then during emergency it was necessary to establish a regulated system acceptable to all and which is efficient.

NGOs

- NGOs were entrusted the relief works because they are more acceptable to the public due to their operational flexibilities compared to Government working. Gujarat traditionally has a very strong base for NGO due to various reasons and that is why one of the strong cooperative sectors has in the country and may be in the region.

Findings – Domain Manager Category II

1. There was no Earthquake Relief Plan available with the district administration. Collector activated Cyclone Relief Plan just after the earthquake in Bhuj district.

2. District Collector was responsible for emergency & disaster management in the area under his jurisdiction, but his powers were limited as far as procurements and mobilization of resources was concern.
3. There was no communication between the Bhuj district and external world. Satellite Phone was the only communication medium with us for initial couple of hours until police wireless stations could be restored and made operation

4. The sever post earthquake conditions and hierarchical reporting system were main reasons behind delayed loss assessment reports from the remote area.

5. Absence of Government orders for regulating aid works (for about initial ten days) proved blessing then a short coming as this gave a free hand to the appointed special district collectors to act in sync with the post disaster dynamics.

6. Earthquake caused huge casualties and injuries. District hospital was totally destroyed. By evening we had exhausted all medications available in the town where as there was constant flow of dead bodies and injured in the makeshift treatment area in the jubilee ground.

7. Dead bodies were pilling up. Administration decided to handover bodies to family members for funeral after taking photograph for identification. By evening the there was not a single photo film spool left in the town.

8. It was difficult to mobilize the State transport buses for transferring injured to neighbouring health facilities as bus drivers would not come and in some cases the drivers had taken buses for sheltering their families.

9. Majority of rescue work was done by the neighbors and relatives.

10. The district administration had no resources / inventory. There were acute need of JCB and heavy machinery for removing debris, but it took time before few can be organized. Resources scarcity delayed crucial rescue work.
11. Relief supplies arrived by air at Bhuj airport on the second day of the earthquake but could not be downloaded due to non-availability of human resources and other priorities.

12. There was an acute need of labor and smaller vehicles which can be run on roads blocked by debris.

13. Relief supply management consumed maximum Government resources during earthquake.

14. NGOs could not manage well important and crucial relief inventory. Parts of water softening plants were found scattered in a barren field.

15. Community representative (Samaj leader) played a very supportive and useful role in relief management.

16. Resources of district administration got shattered in earthquake and much needed “Command and Control” were absent. District collector, who got traumatized, was replaced on the third day of the earthquake.

17. Free, to-&-fro bus service in the affected area (specifically Bhuj) proved disastrous and baggers and unwanted people from neighbouring towns/state started pouring in for taking relief supplies.

18. “Public relation” skill was important for special collectors posted in the affected area. On average every special collector would see at least 500-600 people with their grievances and he/she has to give them comfort and assurance.

19. Some of the general observations on the official’s deployment in the affected area are as given below.
a. Government officials posted in the affected area were
b. Were not briefed properly before or during deployment
c. Officials not acquainted with the area geography were also inducted
d. There was absence of rotation of the official for days and months.

20. People were not “disaster prepared” and there were no construction codes or regulation in place in Bhuj district.

Response Summery Category-III (Field executives at Taluka/Tahasil and below)

• There was a loud rattling sound like multiple trains were passing by at high speed and we felt tremors in the ground. It was some think like earth below was waverung up and going down along with foot steps. It was difficult to stand on the ground and many were thrown down. There was lots of dust every where and every thing, all buildings were collapsed. Whole village was grounded and one could see scared and crying people all around.

• People were trying to locate their near and dear in the crushed structures and were trying to rescue bumed one. These were the relatives or neighbor who did almost all rescue work on the first day.

• People used “Jacks” used by tractor and bullock cart owners to lift some of the heavy structures to takeout people under the debris.

• People were confused!! While trying to take some one out from debris at a location and suddenly memory of other friend or relative flash that lives two blocks down & you just rush to another location! “Relational hierarchy” would over ride every thing and one would first look at his or her relatives, friends and then others.
At few locations there were distress calls from down below the debris! We could not take these people out as we did not have any JCB kind of things capable of lifting have earth. Jacks could not provide much lift to the heavy slabs. We did not hear any voices after next day afternoon!!

Not a single building was intact including the hospital and dispensaries.

Police station was collapsed and the Police Inspector was buried under the debris. He was dead.

Local doctors were trying to provide first aid to injure. Villagers were helping transporting injured to the health facilities in neighbouring Taluka as it was not possible to treat fractures by the doctors working on street corner. Transportation was another problem, but then people will grab any thing which comes first, no matter it is bullocks cart or tractor or any thing.

There was no communication, no power and no water!!!

Late evening a team of doctors arrived from Delhi with the defense minister in a helicopter. But bare handed doctors could not do much without medical infrastructures – like Operation Theater, steel rods, wooden slabs for jointing and resting fractured limbs. There were many who needed the assistance.

By next day after noon senior government officials started coming in. Some of the NGOs also established their camps by second day night.

A camp was established a senior officer was posted for managing all activities.

From third day onward, there was chaos – there were multiple inflows coming into one place – inflow of Government officials (we received about 1100
government officials from outside area), inflow of NGOs, and inflow of supplies!!!

- Officials coming in will ask for place to sleep, hot water (Jan is a winter period in that part of the world) to bath and food to eat. But we had nothing to offer ...

- Relief supplies were piling up.

- Distribution was difficult as no one had any identity left with him or her. We started distribution of cloths, blankets, tents, food and water. Many misused the Government decision for distribution of relief, waving identification and claimed supplies multiple times.

- Local officials were limited in number and every time there is any new NGO or corporate or UN agency come in, we were directed to take them around village and show destruction. We were losing valuable man-hours in trivial works at that crucial juncture.

- Relief supply management was big problem during several days and even months after the earthquake. This was observed that - expectations of the people are different when they were queued on a government distribution counter compared to when they were in front of a counter managed by any NGO!! They will happily accepted the terms, conditions and quantities of supplies from the relief supply distribution counter managed by NGO, where as they will have heated verbal exchange and argument at Government counters for extra claims !!!

- The Government order (GR) issued for disbursing cash assistance for Rs 1200 to each family did say anything on - “definition of a family” and neither mentioned the procedure to be followed for validation and verification of family units. People have lost their ration cards and IDs. Officials inducted from other state do not know them and local staff strength was inadequate to handle the work. This
was a very tedious task to work out, identify and disburse the cash assistance to villagers. Government GR/Orders issued during emergencies should be end-to-end, without any cross reference or link to another order so as the action and implementation can start spontaneously. Such orders should be speaking orders needing no explanation and interpretations.

- Local Government officials and staff were worst affected people from all angles. They had to report for duty even if they suffered losses. They were there to face multiple forces acting from higher offices/officials, public at large, NGOs and others during emergency and relief response work.

- Many of the officials had to face investigations once after the relief work was over as some unhappy individual or political party complained against him.

- At junior level, this is a general feeling that an official who has experienced working in disaster relief work will never like to work again if situation arises!! It is better to be punished for running away from duty then to work during emergency - live under stress and face investigations for several months there after.

- 1200 people died in the Bhachau Village with a population of 25000.

Finding – Domain Manager’s Category III

- Neighbors, friend, relatives and the local people were most effective in rescue work just after the earthquake. People used tractor / car jacks, ropes, and other domestic tools for helping rescue work.

- Government buildings and resources were damaged.
• Villagers used bullock carts and tractors for transporting injured to neighbouring district hospitals.

• There was no electricity, water and telecommunication in the whole area.

• Team of doctors arrived by helicopter did not have equipments, accessories and material to treat earthquake related injuries (like fractures, severed limbs etc...)

• Very critical man-hours of the local officials were wasted in attending to and providing facility management to NGOs and Government officials coming from all over.

• Difficulties were encountered while regulating relief supply distribution in absence of authentic identity of individual. Government waver for identification added to mismanagement as – people not belonging to that area started availing supplies, leaving genuine local residents behind.

• Typically, People keep their expectation level higher (and some time unrealistic) while interacting with Government system then any others (NGO, Corporate etc). Heated argument on supplies at the Government counters was common, where as NGO counters were seen peaceful and smooth majority of time.

• Junior officials / staff at the Taluka were in the worst affected people during such disasters. During rescue & relief phase they were pulled by all – Visiting Government officials, NGOs, and public at large. And in post emergency scenario they face multiple inquires and investigations for reasons beyond their control. Abstaining from the duty during such emergency was considered a better option then participating so as post disaster negative manifestations in the post disaster phase can be avoided.
8.4 Key findings

- State did not have any established policy, Act or Legislation for emergency and disaster management.
- There were no construction codes in place.
- State Government had emergency response plan for earthquake. District Collector Bhuj activated Cyclone emergency relief plan.
- State neither had emergency resource inventories nor had any mechanism for mobilization of such resources in a short time frame.
- State did not have a contingency plan for substituting traumatized domain managers at various levels in hierarchy (State, District and Taluka).
- State had no emergency communication network system except a satellite phone with each district. All Taluka were disconnected from the district HQ as there was a total communication blackout in the region. It took some time before the Sat phone could be retrieved from the damaged government building.
- Voice communication on satellite phone was posing problem for new users due to inherent time delay. Fax messages sent through Sat phones were found more useful due to message clarity.
- State did not have any GIS supported model for simulating loss estimation in the area.
- State did not have any established procedure or plan for identifying and inducting agencies other than Government into emergency response.
- State did not have any established plan or procedure for regulating induction of Government resources in emergency response.
- Central Government did not have GIS supported model for loss estimation.
- Central Government did not have any “single window” emergency and disaster response coordination approach.
- There was no established National Policy and Act / Legislation for Disaster management.
• Sever damage inflicted on District Administration (including district hospital) and the Army camping in the area proved devastating and brought down emergency response capacity significantly.

• It took time before losses could be estimated as all access roads were damaged and telecommunication channels down.

• Relatives, neighbors, community volunteers, religious agencies and some army resources were the first responders during initial 24 Hours after the earthquake.

• Public information dissemination on the relief measures was nearly absent in the affected area. No one knew about the relief counters or where to go for assistance.

• Medical resources such as personnel, medical supplies, ambulances, hospital beds, and medical supplies / equipments were damaged or distorted. Their location, distribution of response units and availability was not congruent with the type, volume, and distribution of injuries.

• With in eight of hours of the earthquake all medicines in the Bhuj town were exhausted. There were no more medicines at / after 1600 Hrs on 26 January 2001 for treating injured and sick. Transporting injured to nearby districts had problems due to low availability of buses and operators (drivers). Each and every one (including drivers) in the town suffered from the impact (directly or indirectly) and they had their own priorities.

• Hierarchical Government functioning and absence of adequate communication channels retarded speed of response work.

• Uncontrolled inflow of visitors (NGOs, Aid agencies, Government officials, others) combined with equally unmanaged relief supply material from all around was another element responsible for retarding response efficiency.

• Valuable time of domain managers (category III), who were very limited in number during first few days, was lost in introducing and facilitating visitors into the affected area. The domain managers at Taluka were under maximum pressure from both the sides e.g. Government in upstream and public at down stream. Motivation level was very low for these officials.

• Valuable time was also lost in managing uneven relief supplies pouring in.
• Community (samaj) leaders / representatives and religious agencies played a very effective role in relief supply management.

8.5 Concluding Remarks

Findings from in-depth interviews / interaction with the "bureaucracy domain managers" and the learnings do provide useful insights into the qualitative dimensions of the research. This chapter serves as a window to see, understand and analyze impact of, that time existing Government policies, procedures and Organisation system on 26 January 2001 earthquake management. Further qualitative analysis, with variables identified here, is carried out in the subsequent chapters.