Chapter 3

Literature Review on Disaster Management
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3.1 Introduction

Most of the world’s worst disasters occur between the Tropics of Cancer and Capricorn, Asia being the most affected continent with 39% of the total disasters reported from 1992-2001, accounting for 74.5% of the total casualties (IFRC 2002). The state of India covers an area of 3.3 million sq. km., extending from the Himalayas in the north to the tropical rain forests in the south. It lies entirely in the northern hemisphere, the mainland extending between latitudes 8°4' and 37°6’ north and longitudes 68°7’ and 97°25’ east. Surrounded by the Bay of Bengal in the east, Arabian Sea to the west, and the Indian Ocean to the south, the total length of the coastline of the mainland, Lakshadweep Islands, and the Andaman and Nicobar Islands is 7,516.6 km. The Himalayas form a natural barrier for the peninsula from mainland Asia. Extending 2,500 km over northern India, the three parallel ranges, the Himadri, Himachal, and Shivaliks, have deep canyons gorged by rivers flowing into the Gangetic Plain. The topography varies from high mountains in the north, to flat rolling plains and the Deccan Plateau in the south.

The record of earthquakes in India is patchy prior to 1800 and its improvement is much impeded by its dispersal in a dozen local languages, and several colonial archives. Despite a written tradition extending beyond 1500 BC very little information is available on records about Indian earthquakes earlier than 500 years before the present, and records are close to complete only for earthquakes in the most recent 200 years.

Seismic experts have found characteristic similarity between the Earthquakes in Kutch district in 1819 and that in 2001. Damage reports from Bhuj and Anjar are distressingly similar to the damage reports of the 1819 earthquake when fewer than 2000 were killed. The population of Kutch is now many times greater than it was in 1819 but the percentage of the local population killed is roughly the same. Over all 7633 villages in 21 (out of 25) districts of Gujarat were affected to varying degree. The number of human lives lost was 13805 people. About 167000 injured and over a million houses were
damaged or destroyed (Misra, 2004). Aggregate losses valued for more the Rs 20000 crores (approx $ 4 billions) occurred in the 26th Jan 2001 Earthquake. Same percentage (approx) of deaths in 1819 and 2001 despite the facts that there exists - technology advancement in building constructions, disaster mitigation plan , safety and rescue system and availability and implementation of a seismic resistant building code!

The ferocity and impact of natural disasters in recent years has exceeded even the worst history. Disasters occurred in areas that had not been previously seen to be vulnerable to that particular disaster, or struck a traditionally vulnerable area with more intensity. In 2001 as a whole, India suffered 73.1% of all disaster-related deaths in Asia (IFRC 2002). Disaster management has proceeded with several levels of evolutions in concepts and applications in the Government network system. Traditionally, Government has played a critical and major role in emergency & disaster management (in earlier context relief management) every where in the world. But vast variation is noticed in “effectiveness” of Government’s role during disaster. Very little is described on the “differential effectiveness of disaster management” between two different systems or two different countries.” Uncertainties” involved in the subject matter associated with social-political and economical situation, which influence priorities, can be attributed to the “differential disaster management patterns”. A measure of 6.9 on the Richter scale is not so very extraordinary in itself. Earthquakes of that severity are not very uncommon in India and in California earthquakes of this magnitude cause little or no mortality.

In the last century there have been more than 250 earthquakes above 6.0, many of them comparable with 2001 Bhuj earthquake. North-East India experiences an earthquake measuring over 5.0 on the Richter Scale every 4 months and over 6.0 every 9 months. Assam experienced a colossal earthquake measuring 8.6 in 1950, - one of the severest recorded anywhere in the world. But the Gujarat earthquake was unexpected, and had not been prepared for. The mortality caused by earthquakes in India is not well recorded but seems to vary widely. Human factors, notably building methods as well as severity, timing, extent and population density play major role in deciding the severity of the incident. The earthquake destroyed 90 percent of the homes in Bhuj, several schools and
the hospitals were flattened. Considerable damage occurred also at Bhachau, Anjar and Rapar. In Ahmedabad, Gujarat's commercial capital and a city, with a population of about 4.5 millions, as many as 50 multistoried buildings collapsed and several hundred people were killed. In one of the most heartbreaking events, about 400 school children on a Republic Day march through a street lost their lives. Many others were injured by collapsing walls of nearby buildings.

This chapter takes an overview of the journey and progress made in disaster management and identifies gaps in the literature. The literature review also devotes some discussions on the domain of inquiry, i.e., Disaster Management policy framework available for National (India), State (Gujarat) and Local level Emergency Response Plan, role & responsibility of various stakeholders in Disaster Management, Organization structure, and use of modern technology tools and their influence on the performance of Disaster Management.

3.2 Issues Relating to Disaster Management

Human being have always had to deal with the natural and man-made disasters- from famine and flood to plagues, draughts, earthquakes, and war. Relying on limited personal and community resources, they respond as best they can. Such efforts- now categorized as personal preparedness- remain an important part of emergency management. Even today, as most studies show, the first responder to the disaster are typically survivors: family and assistance from neighbors.

With the growth and development of the social system in the community emergency management became responsibility of the local, and to some extent, governing agency. In the western world- several national level originations were created to provide assistance during major natural disasters in the nineteenth century. American Red Cross, established in 1881: the National Weather service; the US Army; US cost guards are some of the examples of such agencies added in disaster response efforts (ICMA, 2008).
Disasters are the defining events in a hazard cycle that commonly is characterized by its four temporal stages: mitigation, preparedness, response and recovery (National Governors' Association, USA, 1979). Hazard mitigation involves actions taken before a disaster to decrease vulnerability, primarily through measures that reduce casualties and exposure to damage and disruption or that provide passive protection during disaster impact. Mitigation measures include land-use regulations that reduce hazard exposure and building codes and construction practices designed to ensure that structures resist the physical impacts created by hazards, such as wind, water, or seismic forces (ICMA, 2008).

**Disaster Preparedness – A perspective**

Several studies conducted in 1970s and 1980s, in USA, focused on the preparedness activities undertaken by the emergency management agencies at the local level (Tierney, 2001) Preparedness is viewed as "actions taken in advance of an emergency to develop operational capabilities and to facilitate an effective response in the event an emergency occurs" (Godschalk, 1991, p.136). Gillespie and Streeter (1987, p. 155) define preparedness as planning, resource identification, warning systems, training, simulations, and other pre-disaster actions taken with the sole intent of improving the safety and effectiveness of a community's response during a disaster. Mileti (1991, p. 215) states, "preparedness includes such activities as formulating, testing, and exercising disaster plans; providing training for disaster responders and the general public; and communicating with the public and others about disaster vulnerability and what to do to reduce it."

Main goals of preparedness activities are to foresee problems and project possible solutions (Kreps, 1991, p. 34). Along these lines, Mileti (1991, p. 215) declares that "the purpose of preparedness is to anticipate problems in disasters so that ways can be devised to address the problems effectively and so that the resources needed for an effective response are in place before hand". Although such activities may include preventative
actions, the preparedness phase of emergency management assumes a disaster is likely to occur. In contrast, mitigation presumes that a disaster can be prevented or that its impact can be minimized.

"Effective preparedness and response activities help save lives, reduce injuries, limit property damage, and minimize all sorts of disruptions that disasters cause". It has been proven that the ability to improvise during a disaster is greatly increased with the minimum amount of preparedness (Kreps, 1991, p. 34). Preparedness therefore helps to protect community values, reduces the "unknown" during a disaster, and may even allow for enhanced flexibility in response.

Preparedness is also important because it increases inter-organizational coordination and communication - typical problems associated with disaster response operations (Auf der Heide, 1989, p. 39). Preparedness establishes the responsibilities of key players (e.g. community officials, state officials, outside agencies, municipalities, first responders, hospitals, etc.) for disaster response. A joint planning and disaster rehearsal activity, for example, facilitates coordination and strengthens personal relationships among participating agencies (Dynes, 1994, p. 147). Preparedness likewise helps to identify resources (e.g. personnel, time, money, equipment, supplies, or facilities) that a community may need for the response and recovery phases of disaster (Auf der Heide, 1989, p. 39). A further benefit of preparedness is that it identifies functions (e.g. resource management, evacuations, damage assessment, and causality containment) that need to be performed in times of a disaster (Auf der Heide, 1989, p. 41). For these and other reasons, the merit of disaster preparedness cannot be overestimated.

Dynes (1994, p. 151) declares that an additional difficulty that organizations may have during a disaster is emergence. Most emergency plans do not cover how to deal with or assimilate emergent groups into the disaster response and recovery phases. Research illustrates that organizations generally have four different responding behaviors during a disaster: "established (regular tasks, old structures), expanding (regular tasks, new structures), extending (non-regular tasks, old structures), and emergent (non-regular tasks, new structures)" (Dynes, 1994, p. 150). In contrast to the other types of group
behavior, emergent groups appear when individuals and organizations replace their traditional structures and functions with new ones. Emergent behavior also manifests itself when demands are not being met by existing organizations (Drabek and McEntire, 2003, pp. 97-112). These emergent groups include, but are not limited to, volunteers, emergency workers, churches and other worried or inquisitive parties. They participate in a wide variety of activities: collecting of relief supplies, providing shelters, offering emotional support and search and rescue operations. Although emergence can be beneficial after a disaster, emergent behavior can also create several problems. When there is an over abundance of material supplies, people and media this can lead to "mass assault" which can detract from or inhibit the response operations in a disaster (Drabek and McEntire, 2003, pp. 97-112). Dynes (1994, p. 151) states- "Planning which assumes that emergency problems can be handled solely by established organizations, is working with a myopic view of the emergency period". Planning must therefore be based on valid assumptions about human behavior in disasters.

Research on disasters also reveals that apathy is the biggest problem associated with planning and preparedness activities (Auf der Heide, 1989, pp. 33-47). Apathy, or the lack of concern or interest in a particular issue, is present in the emergency management field for a variety of reasons. The actual likelihood of a disaster affecting any particular geographic area and the citizens who live there is very low, thus causing indifference in the community. People do not have extensive knowledge about the hazards in their area, which contributes to their lack of concern (Kreps, 1991, pp. 30-54). Furthermore, the value and importance of preparedness and its processes are sometimes unknown and difficult to quantify. Hence, those endorsing disaster preparedness are likely to encounter a lack of interest or even fierce opposition.

Another finding in the literature is that communities often create elaborate emergency operations plans, but they fail to develop the capability to implement these plans. In other words, a plan is written but it sits on a shelf without anyone exercising or taking time to train on its activities. Auf Der Heide (1989, p. 33) states, "disaster plans are important, but they are not enough by themselves to assure preparedness... they can be an illusion of preparedness if they are not tied to training programs, not acceptable to the
intended users, not tied to the necessary resources, or not based on valid assumptions. This illusion is called the paper plan syndrome" (Auf der Heide, 1989, p. 33). Those preparing for disasters should, therefore, ensure that their plans are realistic and achievable in practice.

Considerably more is known about preparedness activities among public sector organizations, particularly local emergency management agencies and other crisis-oriented organizations than about other types of organizations. However, even this research is far from comprehensive. Further, although a number of studies address general preparedness issues, researchers have also tended to focus on organizational preparedness for specific kinds of hazards, such as chemical emergencies or accidents involving hazardous wastes (Sorensen and Rogers, 1988; Faupel and Bailey, 1988). Hazards have low salience for most organizations except when there is an imminent threat, and potential disaster-related problems must compete with other more pressing concerns on an organization's agenda. Moreover, organizations that are experiencing financial difficulty will tend to downplay preparedness if it is seen as low-priority or optional; and even when a danger is recognized the resources necessary to deal with it may not be adequate.

Generalizing from research in the broader literature on implementation, Waugh (1988) has argued that preparedness programs are difficult to implement because of five general types of impediments: the overall intractability of the disaster problem; the lack of clear and measurable performance objectives; insufficient resources; inadequate levels of public and official support; and the fact that higher governmental levels vide insufficient emergency management expertise and guidance to local communities.

From a practical point of view, emergency preparedness is a central concern for only a very small number of organizations. For the large majority, disaster-related issues are peripheral or incidental to organizational goals and priorities. It follows that the less an organization sees itself as having important disaster functions the more difficult it will be
to stimulate preparedness. This difference in the priority placed on disasters—that is, the distinction between organizations for which responding to disasters is a primary organizational mission and those for which it is not, will serve as an organizing device for the discussion that follows. We begin by looking at preparedness activities among crisis-relevant organizations and then move on to consider other kinds of organizations, including private businesses.

The preparedness activities engaged in by local emergency management agencies have been a major research emphasis since the disaster research field began. William Anderson's Local Civil Defense in Natural Disaster: From Office to Organization (William, 1969) was a pioneering study on this topic. That report characterized as uncertain both the roles and the environment in which local crisis-management offices operated. Anderson argued that this uncertainty stemmed from the lack of a consistent resource base for operations, public indifference to the emergency management function, and confusion over organizational bases of authority and task domains. Anderson concluded that the emergency management function for natural disasters was not well-institutionalized in U. S. communities. Nine different models were identified: maintenance, military, disaster expert, administrative staff, derived political power, interpersonal broker, abstract planner, community educator, and simulation. In that same study, preparedness activities were found to be fragmented rather than integrated across different organizations and sectors. As a result, organizations tended to plan for disasters in isolation from one another.

On the positive side, the scope of preparedness that is, the different disaster agents that were considered, was broader than it had been previously. The report also noted that over time more community organizations were becoming more interested in planning for disasters, and planning was becoming more integrated. Four general sets of factors were identified that enhanced the legitimacy of local emergency management agencies. The first two were the existence of persistent hazards and the integration of the emergency management office into the day-to-day activities and structure of local government. The
other factors judged to be important were the ability of the emergency management office to forge relationships with a range of other community organizations and concrete outputs that emergency management organizations could provide to the community, such as the maintenance of an emergency operations center.

A follow-up to the Dynes and Quarantelli study described above, which was conducted during the early 1980s, found that local emergency management agencies remain diverse in their organization and operations (Wenger, Quarantelli, and Dynes, 1986). Those agencies vary in a number of ways, including domains and responsibilities, relationships with other emergency-relevant organizations, and resources available to manage disasters. The report judged this diversity to be both natural and desirable, indicating that emergency management agencies are well-adapted to local conditions. Other studies have also found considerable variability and diversity among local emergency management agencies. The International City Management Association’s 1982 survey of more than 6,000 local and county governmental units found considerable structural variation and lack of standardization. Drabek (1993: 6) places a good deal of emphasis on the personal attributes of emergency managers themselves, arguing that “the single most significant societal change that has most altered community preparedness has been the increased professionalization of local emergency managers. In his in-depth study of 12 successful emergency managers, Drabek (1990) identified 15 different strategies those individuals employed to keep their agencies on track and to deal with environmental uncertainty, including working to increase constituency support, coalitions, mergers, and joint ventures.

There are numerous steps that should be taken to prepare a community for disaster. These process include: establishing emergency management ordinance; assessing hazards, vulnerabilities and risks; creating an emergency operation plan; developing a warning
system; identifying and acquiring resources; instituting mutual aid agreements, training; exercising and educating people.

Community / Household Preparedness

Factors Associated with Household Preparedness Research conducted to date suggests that people are encouraged to prepare for disasters under three conditions. First, the threat of disaster must be seen as high in the short-term – as occur, for example, when a specific warning or hazard advisory has been issued for a given community. Second, the source disseminating the hazard and preparedness information must be seen as credible. And third, the preparedness information must be provided repeatedly through different channels and in a form that is easy to recall and use (e.g., in a printed brochure). It appears to be difficult to stimulate household preparedness for any hazard when people believe there is a low probability of a near-term threat. Why this is the case is not clear. Members of the public may pay less attention to preparedness messages under those circumstances, and consequently remember less, or they may tend to focus more on emotion-centered coping responses such as denial of the threat during such periods. It is also possible that they attend to, comprehend, and accept preparedness messages but postpone action until later. A further troubling finding from Mileti and O'Brien's work on response to aftershock warnings is that even when a damaging disaster has recently occurred, households that escaped damage may subsequently have a tendency to disregard messages about an ongoing threat. These findings are consistent with Kates's (1962) earlier characterization of people as "prisoners of their experience." Evidently many people have a tendency to believe that what already has happened is the worst that can happen. As a result of research undertaken in the past 25 years we know that household preparedness activities are socially structured, and we have a much clearer idea of the social factors that influence household preparedness (Tierney et al, 2001).

Actions to protect the household are more likely to be undertaken by those who: are routinely more attentive to the media (primarily those who are educated, female, and...
white); are more concerned about other types of social and environmental threats; have personally experienced disaster damage; are responsible for the safety of school-age children; are linked with the community through long-term residence, home ownership, or high levels of social involvement; and can afford to take the necessary steps to prepare (Turner, 1986). The literature suggests that, other things being equal, households with higher socioeconomic status are better prepared for disasters than their financially less-well-off counterparts and that ethnic minorities show a lower propensity to engage in emergency preparedness activities. People who are poor and marginalized have fewer resources to devote to preparedness and have less access to information on hazard reduction (Perry, 1984).

What is not well understood is how strategies can be developed to reach under-informed and under-prepared populations and to make preparedness feasible and affordable for the financially less-well-off. This possesses a big challenge for all developing countries where number of poor, marginalized and uneducated exceeds the number of people who are well-off. Scarcities and draughts were very common in India and saving grains for difficult time was a common practice in the community. One needs to know characteristics (type of event, what will it cause, who will be impacted, how long it will last etc...) of the “probable event” to become prepared for that. People had knowledge about draught and they would save grains for bad times ahead. Poor knowledge on hazards, vulnerabilities and risks resulted into poor community preparedness. Disasters impact maximum where poor knowledge combines with the poverty or economically weak community.

*Alert & Warning System*

The traditional relief oriented disaster management approach continued in India even after 1947 (When Indian became a free country). Alert and Warning channels will start from on government office and end in some other Government office without reaching to
the vulnerable masses. There was practically no concept of necessity of custom designed public alert and warning system. Beside technological limitation with the Government for monitoring, measuring, analyzing and forecasting events, other bottlenecks in the way of dissemination of alert & warning included – limited coverage of mass media, power scarcity and shortage (majority of villages did not have electricity), lower education in the rural areas. Till late 80’s, Reliability of predictions or forecast from the Government agencies was so poor that people would prefer to consult their astrologer for monsoon rains then tuning in to All India Radio and listen to Indian Meteorological Departments forecast bulletins. There is practically a scarcity of research reference in the area of disaster alert and warning system in India context. Majority of studies in this area are covered by researchers of western world. Losses and damages inflicted in 26 January 2001 Bhuj earthquake triggered serious a debate on the changing needs for alert and warning systems under the “re-active / pro-active” disaster management practices.

Research on household emergency response has focused on warning receipt and protective response activities examining issues like- the sources and channels from which people receive warnings, the credibility of those sources, when people receive warnings, and the degree to which they pass on warnings and seek further information from friends, relatives, neighbors, and coworkers. Researchers have repeatedly affirmed the theory that - A warning message is most likely to motivate timely and effective action if it creates a perception of the threat as being certain to occur and as having severe and immediate consequences for recipients. Moreover, protective action is more likely to be undertaken if the warning describes (or leads recipients to recall) a protective action that is effective, but at the same time doesn’t involve large monetary costs, time and effort requirements, or other barriers, such as the need for specialized knowledge or cooperation with others (Dynes and Quarantelli, 1976; Carter et al., 1977; Perry et al., 1981; Houts et al., 1984; Lindell and Perry, 1992).
Warning Dissemination:

There are several different mechanisms available for dissemination of warnings including - face-to-face, Sirens, route alert loudspeakers, tone alert radios, and commercial telephone, radio, and television etc. Earlier systems in India used a drum beater who would walk around the communities and announce the message followed by loud drum beats resulting into attraction of attention of large number of people in surrounding areas. But these mechanism will very along many number of dimensions- like -Precision of dissemination, their ability to get people’s attention as they go about their normal activities, the specificity of the message that can be conveyed, susceptibility of the message to distortion, the rate of dissemination over time, receiver and sender requirements, the ability to verify warning messages upon receipt, and initial and ongoing operating costs (Lindell and Perry, 1987; Sorensen and Mileti, 1987). From a research standpoint, these variations make it quite difficult to generalize across studies involving warning response. From a practical standpoint, they make the design of warning systems and the issuing of warnings very challenging.

Recent literature raises some important questions about the extent to which community residents comply with warning messages involving different types of disaster agents and whether the public responds in atypical ways when particular types of disaster agents, such as nuclear hazards, are involved. On the one hand, research has consistently found a pattern of under-response to threat, characterized by warning responses that are too slow and incomplete in the risk area. As noted above, disbelief is a common initial response to warning messages, and many people appear determined to remain in harm’s way when disaster strikes despite clear and specific warnings. On the other hand, research on evacuation during the Three Mile Island nuclear plant emergency found evidence of an “evacuation shadow.” Specifically, Zeigler, Brunn, and Johnson (1981) found that there was movement out of the area by people living outside the risk zone designated by the governor’s protective action order (Zeigler, Brunn, and Johnson, 1981). Other studies of Three Mile Island and of radiation hazards more generally concluded that an evacuation
shadow probably arose because people judged by authorities not to be at risk nevertheless came to define themselves as in danger because of confusing and conflicting information from authorities, geographic proximity to the plant, and similarity to demographic groups targeted in the warning messages (Houts et al., 1984; Lindell and Perry, 1983; Lindell and Barnes, 1986). In other words, while in some crisis situations people within identified hazardous areas show a marked tendency not to move when they’re told, in other kinds of emergencies people who are outside designated risk areas move even though they are not told to. The latter situation can add to traffic congestion and cause confusion about which areas are safe and which are not.

In a similar situation of recent past – media news on the possible plague outbreak in Surat city (State of Gujarat, India) triggered mass exodus from city and surroundings despite all efforts of the administration to stop that. People took any means of transport they came across at any price to get out of that so called “plague town”. All high ways were chocked with all kinds of transport systems bringing interstate commercial activities practically to a halt. Needless to say that – lack of knowledge led to “risk over estimation or perception” by the inhibits. The situation also proved that - attempts made to educate people on their risk exposure, during the crises, does not succeed unlike in the pre-disaster phase.

In another situation during 2001 Bhuj earthquake, State Government repeatedly issued warnings that people from out side area should not enter into the earthquake affected areas due to various reasons, but there was no effect of such warning and people still reached the affected areas adding more stress to local resources which were already under acute stress. In majority of cases – reason behind ignoring warnings was – the incumbent were eager to know about welfare of their kinship / relatives who were there in the affected area at the time of earthquake. In absence of any communication (telecom system was totally down) they decided to travel into the affected area.
Risk perception is measured in a variety of ways: as the perceived likelihood of a particular type of event, such as an earthquake; as the perceived magnitude of an event; as expectations about the severity of its impacts on the community; and as expectations about the personal threat or threat to kinship posed by the hazard.

3.3 Emergent & Developmental Disaster Management

The extensive research work undertaken during last 30 years on disaster preparedness worked as catalyst in the area of developmental disaster management globally. Literature suggests that the modern disaster systems need to be focused on to the "emergent disaster management concept" working with a multi-hazard-multi-agency (MHMA). The new approach need to cover disaster caused by human beings which have become more and more common in the 20th century. Unlike earthquakes and other natural catastrophes, this "new species of trouble" afflict persons and groups in particularly disruptive ways. Changing characteristics of manmade disasters have made modern society more vulnerable than ever before. For example, the Three Mile Island, Bhopal gas tragedy and other man-made disasters resulted in years of litigation to punish the "polluter" and created community tension and acrimony. It is observed that attention must be paid to the experiences of communities suffering from these disasters if people are to maintain elementary confidence not only in them but also in society, government, and even life itself (Erkson, 1995).

A major finding in the literature suggests that disasters do not have random or unpredictable effects but disproportionally harm socially vulnerable groups that are already marginal (Tierney et al, 2001) This adds another issue to the disaster management
strategy (more critical for developing countries) where the approach need to be oriented
toward evolving a -“developmental & emergent disaster management system” which can
offer benefit to the people at the lowest strata in the society.

Western research suggests that “good” planning activities emphasize the following:
rehearsals, public education, developing linkages among groups; empowering community
members to take part in planning; general planning that crosses agencies and types of
disasters; resource coordination rather than the centralization of authority; coordination
among planners including police, hospitals, military and private sector organizations; and
using social science knowledge rather than myths and misconceptions. The disaster
management policy and practices need to recognize that –

- there are needs generated by the disaster itself (e.g., exposure to flooding,
radiation) and problems generated by the response itself (such as the effective
mobilization of resources and people);
- there are generic functions for all types of disasters—warnings, evacuations,
sheltering, emergency medical care, and search and rescue;
- there needs to be task delegation and a division of labor so that conflicts over
responsibilities and clashes between emergent and established groups are
minimized;
- there needs to be multiple information flows not secrecy or denial; overall
coordination models, and the blending of emergent and established groups (even
if not planned for) (Quarantelli, 1998).

Another view expressed in a research, with reference to increasing losses due to natural
and technological hazards in USA is due to “narrow and shortsighted” development
patterns, attitudes, and ideology toward the natural environment and science and
technology. The author claims that the really big catastrophes are getting larger and will
continue to get larger, partly because of the use of technology to reduce risk. For
example, building a dam or levee may protect a community from the small- and medium-
sized floods, but additional housing or commercial development that occurs because
of this protection will mean even greater losses during a big flood that causes the dam or levee to fail. Mileti (1991) concludes that many of the accepted methods for coping with hazards have been based on the idea that people can use technology to control nature to make them safe without controlling other problems such as over-development. This is right time for third world (on the start line of development) to consider hazard aspect in the developmental works and suitably provision coverage to the society for making it more safer and secured place to live.

Most of research on the subjects of emergency response and disaster management are based on the events that occurred in the first world countries and are only partially applicable to the third world countries. In absence of the reference from second and third world countries, most of the disaster management policies drawn in the third world follows “practices or the best practices” from the first world. The current policy frame work drawn by the Indian National Government, in general, is based on the disaster management policy and practices followed in the United States of America. Following is summery of the “best practices” recommended by a joint commission consisting of National Academy of Public Administration (NAPA) and General Accounting Office (GAO), USA.

- Refine National Response Plan (NRP) – giving clarity on duties and relationship with responsible federal agencies, and non Government organizations (NGOs);
- Disaster Management Agency and Military – GAO recommended that the congress remove the statutory restriction on defense department’s ability to activation of reserve units for disaster relief operations. As a result, in each state the national guards are under direction of Governor unless the President has already called the guards into the federal services. NAPA recommends that the state Guards should play more extensive role in emergency management.
- The NAPA and GAO reports conclude: that core domestic emergency management operation should not be transferred to the military and that the military should assume a supplemental disaster relief role.
- There should be domestic crisis unit within the federal disaster management agency and the unit should be empowered to begin national mobilization during
the onset of an expected catastrophic disaster and in absence of required gubernatorial request for a presidential disaster declaration.

• The NAPA and GAO report recommends that the agency needs to better integrate academic and professional scholarships into training and education programs it provides to its employees. There should be no gap between the training course offered by the national Disaster training Institution and the State disaster training institutions.

• Central disaster management agency should work more collegially with police, fire services, emergency medical authorities, public works, environmental emergency response units, emergency human resources agencies, and a host of others. All efforts should be made to promote & inculcate cross or multidisciplinary emergency management profession. Such enforcement would be possible only with the central planning grants. There should be certain minim level of standardization of practices amongst the agencies like - police, fire, and emergency medical, occupational and professional.

A snapshot of Disaster Management in terms of the best practices referring to Indian National / State and in international arena is provided in the table given below.

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Best disaster management policies have been focused around the concept of "preparedness", which is common factor in all phases of the emergency & disaster management. Mileti (1991, p. 239) acknowledges that "effective preparedness and response activities help save lives, reduce injuries, limit property damage, and minimize all sorts of disruptions that disasters cause". It has been proven that the ability to improvise during a disaster is greatly increased with the minimum amount of preparedness (Kreps, 1991, p. 34). Preparedness therefore helps to protect community values, reduces the "unknown" during a disaster, and may even allow for enhanced flexibility in response. Preparedness is also important because it increases inter-organizational coordination and communication - typical problems associated with disaster response operations (Auf der Heide, 1989, p. 39). Preparedness establishes the responsibilities of key players (e.g. community officials, state officials, outside agencies, municipalities, first responders, hospitals, etc.) for disaster response. A joint planning and disaster rehearsal activity, for example, facilitates coordination and strengthens personal relationships among participating agencies (Dynes, 1994, p. 147). Preparedness likewise helps to identify resources (e.g. personnel, time, money, equipment, supplies, or facilities) that a community may need for the response and recovery phases of disaster (Auf der Heide, 1989, p. 39). A further benefit of preparedness is that it identifies functions (e.g. resource management, evacuations, damage assessment, and causality containment) that need to be performed in times of a disaster (Auf der Heide, 1989, p. 41). For these and other reasons, the merit of disaster preparedness cannot be overestimated. Another lesson in the preparedness literature concerns the benefit of Local Emergency Planning Committees (LEPCs). In response to the Superfund Amendments and Reauthorization Act or SARA Title III, many communities in the United States have developed an LEPC. An individual LEPC consists of public safety officers, planners, health care providers, environmental specialists, industry representatives, local
government officials, representatives of schools, community action groups and others (Lindell, 1994, p. 160). LEPCs are responsible for conducting vulnerability analyses, preparing comprehensive emergency response plans, developing site-specific emergency plans, organizing training programs for local emergency responders, conducting drills and filing data about hazards (Lindell, 1994, p. 161). The major contribution of LEPCs is their ability to enhance and build upon prior disaster experience (Lindell, 1994, p. 164). Furthermore, LEPCs have strengthened relationships and communication among emergency responders by increasing continuity between their everyday jobs and their roles in a disaster situation (Lindell, 1994, p. 34). Research on disasters also reveals that apathy is the biggest problem associated with planning and preparedness activities (Auf der Heide, 1989, pp. 33-47).

Researches have established that key to any successful preparedness program is to lay a foundation, which means establishing a law or ordinance that gives the program power and authority. A law or a judgment is necessary to require responsibility for the task of preparedness. An ordinance shows a commitment from the community's governing body to its constituents that preparedness for a disaster is a top priority. Some ordinances related to emergency management have the following sections:

(1) Emergency management plan
(2) Organization
(3) Powers and duties of the director
(4) Joint operations and mutual aid programs
(5) Expenditures and contracts
(6) Conflict with state or federal law and
(7) Violations and penalties.
Non Government Organization (NGOs) in Disaster Management

*US (Western) scenario*

NGOs have no formal arrangements to promote coordination at the operational level, either within a single NGO or across all NGOs. At the strategic level, they have headquarters that generally advocate humanitarian action, raise funds for the organization, and ensure adherence to standards. At the tactical level, they have field offices that have day-to-day responsibility for programs. There is no intermediate-level arrangement to promote coordination until NGO representatives from different organizations meet to discuss a particular crisis, either in ad hoc meetings or in a setting such as a Civil-Military Operations Center (CMOC). Indeed, the CMOC—the operational body that facilitates NGO-military cooperation in the field—was designed to fill the operational void. All interested parties, including agencies of the United Nations, U. S. government agencies, NGOs, and local authorities should meet in the CMOC, which greatly facilitates cooperation.

Although NGOs appear anarchic, they have informal webs that promote coordination, at least among NGOs funded by a strong donor. For example, USAID expects that U. S. funded NGOs will consult among themselves to develop practical divisions of labor. During crises, certain well-established, U. S. based NGOs traditionally receive substantial funding from the U. S. government to provide immediate aid. These NGOs cooperate with each other to ensure that at least the overall U. S. effort is somewhat coherent. Among these NGOs are large organizations such as CARE, Catholic Relief Services (CRS), Save the Children (U. S. chapter), and World Vision. Several individual NGOs often try to take the initiative to coordinate their fellow NGOs and plan for future developments. Although this coordination is usually ad hoc, it does allow for an effective response when the crisis in question develops slowly or is of limited scale. NGOs are particularly likely to take such initiative when operating in a highly dangerous area. Some larger NGOs have central headquarters to promote coordination among their nationally
based affiliates. For example, Adventist Development and Relief Agency (ADRA) has a headquarters in Silver Springs, Maryland, that oversees activities of ADRA worldwide organized under regional offices. CARE, Caritas, Concern, Doctors Without Borders, Mercy Corps International (MCI), Oxfam, Save the Children, and World Vision all have headquarters that coordinate efforts of the nationally based organizations.

In addition, many NGOs are members of professional organizations that promote professional standards. Examples include the U. S. based InterAction, the European-based Voluntary Organizations in Cooperation in Emergency (VOICE), and the International Council of Voluntary Organizations (ICVA). InterAction is a membership organization of approximately 150 U. S. based NGOs that forms standing committees and task forces to conduct projects on matters of mutual concern to its members. For example, the Sphere Project produced and disseminated a set of minimum standards for disaster response in such areas as water supply, sanitation, nutrition, food aid, shelter, and health services. InterAction also provides a clearinghouse for the exchange of information and has descriptions of participating NGO activities in various countries.

**Gujarat (Indian) Scenario**

Community and non-government-organization (NGO) had played a very important role in various extreme incidents in Indian history. Indian famine code (1883) mentioned on procedures to be followed for formation of committees involving community representatives, landlords and other non government originations and their role in relief works. State Relief Rules in India still follows some of famine code provisions (of course in modified version). Scarcity, water shortages and draughts were common phenomenon olden days and massive works and workers were required to operate at grass root level. State Government of Gujarat started a separate office under Director
(Volunteer Agency) for coordinating, organizing and managing induction of NGOs during emergencies for effective results. Opening cattle camps to feed the cattle’s in villages were common (and are still common) in several state and these cattle camps use to operate through NGOs. Collector was nominated as final authority for award of scarcity and other emergency related relief works, but if there is more one district involved then Director (VA) will coordinate under the guidance and control of the relief commissioner. Circle or Taluka relief committees played critical role in all emergency response. Preparations start just on the basis of the forecasts of rains etc... and the Taluka committee would prepare possible lists of works and their operation with financial implications involved.

But later- Volunteer Agencies started getting involved into political affiliations for gaining strength and hold on the award of works. They started losing their image of selfless service to the community and whole philosophy came down. VA stopped having coordination meetings with NGO and affairs started getting more and more political. VA office was, later, merged with the Non Resident Gujarati (NRG) cell and has become dis-functional.

Unethical competition among volunteer agencies and their Political affiliations destroyed one of the best practices in the state of Gujarat. Attitude of service has gone during last ten years, people have become too much greedy, and self oriented. Allotment of relief works started getting influenced by the political interventions and diluting very definition.
of volunteer agency. Non Government Organisation (NGO) sector has become like an industry these days. Instead of providing relief to the affected people and animals interested agencies started giving relief to them selves. Institutions objective got destroyed and so the institution. There will be need to review and redefine role of NGOs in the emergent disaster management.

Community Response in Disaster

There is no literature available on the in Indian context. Early studies on community response to disasters (Tierney et al, 2001) documented a number of changes that occur at the community level in disaster situation. These include enhanced community solidarity and morale, suspension of pre-disaster conflicts, a leveling of status differences, increased level of community involvement and participation, and shift in community priorities to emphasize central task such as the protection of human life. In a classic statement, Dynes (1970:84) observed that:

"Disaster creates unity than disorganization. The consequences of a disaster event on a locality is in the direction of the "creation" of community, not its disorganization, because during the emergency period a consensus of opinion on the priorities of values within a community emerges; a set of norms which encourages and reinforce community members to act in altruistic fashion develops; also, a disaster minimizes conflicts which may have decided the community prior to disaster event."

This is also pointed out in some of the researches that there are situations involving hazard agents in which inter-organizational and community consensus are low, rather than high. In such situations, researchers have observed various response-related problems, including lack of consensus on authority and responsibility, uncertainty about which origination should be involved in the response, ambiguity about what should be done, and even a question about whether it is necessary to do anything at all (Tierney et al, 2001).
Stalling (1988) has argued that consensus and cooperation characteristic need to be qualified in several ways. First, heightened community consensus is generally characterized only of the emergency response phase during and immediately following impact; conflict is common both before and after disaster strikes and during the post disaster recovery period. Second, generalization about community consensus and the emergency of pro-social norms are based largely on US society, and we actually know very little about how applicable they are to other countries, because so little disaster research has been done in other social settings. Third, high level of consensus is probably more characteristic in situation defined as acts of nature then in other kind of emergencies.

3.4 Disasters in India- with a special reference to Earthquakes and the State of Gujarat

Historical Facts

Early earthquakes described in mythical terms include extracts in the Mahabharata (Â1500 BC) during the Kurukshetra battle (Iyengar, 1994), and several semi-religious texts that mention a probable Himalayan earthquake reputed to have occurred during the time of enlightenment of Buddha c. 538 BC. Despite a written tradition extending beyond 1500 BC very little is known about Indian earthquakes and other natural disasters earlier than 500 years before the present, and records are close to complete only for earthquakes in the past 200 years. Archeological excavations in Sindh and Gujarat suggest earthquake damage to now abandoned Harrappan cities. A probable earthquake around 0 AD near the historically important city of Dwarka is recorded as a zone of liquefaction in archeological excavations of the ancient city (Rajendran et al, 2002). The town of Debal (Dewal, Debil, Duil Sind or Sindi) near the current site of Karachi was alleged to have been destroyed in 893 AD (Oldham 1883), but until recently accounts of its collapse and inundation were considered too vague to be taken seriously. Rajendran and Rajendran (2003) present a case that the destruction of Debil was caused by an earthquake linked to the same fault system responsible for the 1819 and 2001 Rann of Kachchh earthquakes,
however, Ambraseys (2003) notes that the sources of Oldham's account probably refer to Daibul (Dvin) in Armenia, and that liquefaction 1100 years ago must be attributed to a different earthquake.

Figure 3.1: Schematic views of Indian tectonics. Plate boundary velocities are indicated in mm/year. Shading indicates flexure of India: a 4 km deep trough near the Himalaya and an inferred minor (40 m) trough in south central India are separated by a bulge.
rises approximately 450 m. Tibet is not a tectonic plate: it extends east-west and converges north-south at approximately 12 mm/year. At the crest of the flexural bulge the surface of the Indian plate is in tension and its base is in compression. Locations and dates of important earthquakes mentioned in the text are shown, with numbers of fatalities in parenthesis where known. With the exception of the Car Nicobar 1881, Assam 1897 and Bhuj 2001 events, none of the rupture zones major earthquakes are known with any certainty. The estimated rupture zones of pre-1800 great earthquakes are shown as unfilled outlines, whereas more recent events are filled white.

In the mid 19th century some of these fragmentary data were collected successively in summaries of earthquakes by Mallett, Baird-Smith and Oldham, but there followed more than a century of archival neglect when little new information surfaced. Recent interest in early earthquakes have engaged historians in India and elsewhere in a systematic search through Urdu, Arabic, Tibetan, Chinese, Nepalese and European languages. Two important publications summarize recent findings: Iyengar and Sharma (1998) report accounts in Arabic, Sanskrit and Urdu sources and Ambraseys & Jackson (2003) provide new data from Tibet and recently collated colonial records.

In September 1737, a catastrophic earthquake is alleged to have occurred in Calcutta. This is the most devastating earthquake to be listed in many catalogues of Indian (and global earthquakes) but is actually a storm surge that resulted in numerous deaths by drowning along the northern coast of the Bay of Bengal. The hand-written ledgers of the East India Company in Bengal detail storm and flood damage to shipping, wharves, warehouses and dwellings in Calcutta with an estimate of 3000 deaths by drowning (Bilham, 1994). Calcutta’s population at the time was approximately 30,000. A figure of 300,000 fatalities is often ascribed to this "fake-quake" for which earthquake shaking was probably invoked in news reports as a metaphor for destruction, a possible description of the buffeting accompanying extreme wind velocities. The spire of St. Anne’s church, Calcutta, was blown down by these winds, but the masonry church survived. An approximate 10% increase in burials is recorded in its churchyard for 1737, an increase in
deaths that year by fewer than two dozen. Although the death-toll from drowning along the coast of southern Bengal was presumably greater than the official estimates in Calcutta, the fatality-count of 300,000 is repeated only in accounts published in monthly magazines and newspapers in Europe, and is not substantiated by official documents from any of the several administrative centers then functioning in Bengal.

The record of earthquakes in India is patchy prior to 1800 and its improvement is much impeded by its dispersal in a dozen local languages, and several colonial archives. Despite a written tradition extending beyond 1500 BC very little information is available on records about Indian earthquakes earlier than 500 years before the present, and records are close to complete only for earthquakes in the most recent 200 years.

<table>
<thead>
<tr>
<th>Year</th>
<th>Location</th>
<th>Magnitude (Richter)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1803</td>
<td>Kumaon Region</td>
<td>7.7</td>
</tr>
<tr>
<td>1819</td>
<td>Kutch</td>
<td>8.0</td>
</tr>
<tr>
<td>1869</td>
<td>Cachar, Assam</td>
<td>7.5</td>
</tr>
<tr>
<td>1885</td>
<td>Sopore, J&amp;K</td>
<td>7.0</td>
</tr>
<tr>
<td>1897</td>
<td>Shillong</td>
<td>8.7</td>
</tr>
<tr>
<td>1905</td>
<td>Kangra, Himachal Pradesh</td>
<td>8.0</td>
</tr>
<tr>
<td>1906</td>
<td>Himachal Pradesh</td>
<td>7.0</td>
</tr>
<tr>
<td>1918</td>
<td>Assam</td>
<td>7.6</td>
</tr>
<tr>
<td>1930</td>
<td>Dhubri, Assam</td>
<td>7.1</td>
</tr>
<tr>
<td>1934</td>
<td>Bihar-Nepal</td>
<td>8.3</td>
</tr>
<tr>
<td>1947</td>
<td>Dibrugarh, Assam</td>
<td>7.8</td>
</tr>
<tr>
<td>1950</td>
<td>Arunachal Pradesh-China border</td>
<td>8.5</td>
</tr>
<tr>
<td>1952</td>
<td>Pondgo &amp; Tango, North East India</td>
<td>7.5</td>
</tr>
<tr>
<td>1956</td>
<td>Anjar, Gujarat</td>
<td>7.0</td>
</tr>
<tr>
<td>1963</td>
<td>Badagaum (Koyna)</td>
<td>5.3</td>
</tr>
<tr>
<td>1966</td>
<td>Nepal-India Border</td>
<td>6.1</td>
</tr>
<tr>
<td>1967</td>
<td>Koyna</td>
<td>6.5</td>
</tr>
<tr>
<td>1968</td>
<td>Manipur-Burma</td>
<td>6.6</td>
</tr>
<tr>
<td>1968</td>
<td>Bihar – Nepal border</td>
<td>6.4</td>
</tr>
<tr>
<td>1991</td>
<td>Uttarkashi, Uttar Pradesh</td>
<td>6.6</td>
</tr>
<tr>
<td>1993</td>
<td>Latur, Maharashtra</td>
<td>6.3</td>
</tr>
<tr>
<td>1997</td>
<td>Jabalpur, Madhya Pradesh</td>
<td>6.0</td>
</tr>
<tr>
<td>1999</td>
<td>Chamoli, Uttar Pradesh</td>
<td>6.8</td>
</tr>
<tr>
<td>2001</td>
<td>Bhuj, Gujarat</td>
<td>6.9</td>
</tr>
<tr>
<td>2005</td>
<td>Jammu &amp; Kashmir</td>
<td>7.6</td>
</tr>
</tbody>
</table>

Source: NCDM 2001; Singh et al. 2000

Figure 3.2: Major Earthquakes in India
India in the early 19th century was as yet incompletely dominated by a British colonial administration. Remote administrators in distant parts of the India subscribed to newspapers and wrote verbose and sometimes extensive descriptions of their experiences which were typically printed and circulated to each administrative outpost. An earthquake in India was something of a rarity and generated detailed letters from residents describing its effects. Very often the same report would be copied verbatim from one newspaper and reported by another. Few of the original letters have survived, but the earthquakes in Kumaon in 1803, Nepal in 1833 and Afghanistan in 1842 were felt sufficiently widely to lead scientifically inclined officials to take a special interest in the physics and geography of earthquakes. Mallett's 1852-55 global catalogues of earthquakes included several from India, with a special section devoted to the 1833 earthquake for which he discussed seismic propagation velocities.

The director of the Geological Survey of India, Thomas Oldham (1816-1878) published the first real catalog of significant Indian events in 1883. His catalog includes earthquakes from 893 to 1869, and acknowledges the works of Mallet and Baird-Smith. His important additions include verbatim textual extracts with references that permit verification and further work. His notes on some of the earthquakes form the first case detailed studies of individual earthquakes. His son, Richard D. Oldham (1858-1936), wrote accounts of four major Indian earthquakes (1819, 1869, 1881, and 1897). He completed first his father's manuscript on the 1869 Silchar, Cachar, Assam earthquake which was published under his father's name (Oldham, 1884). Oldham wrote his account of the 1819 earthquake in Kachchh in retirement in England (Oldham, 1928). His monograph synthesized all the data available for the Allah Bund earthquake on the northern edge of the Rann of Kachchh close to what is now the India/Pakistan border. The earthquake figures prominently in Lyell's Principles of Geology (1830) as one of the first clear examples of geological uplift associated with an earthquake.
The earliest administrative reference available on the natural disaster in Gujarat state (Earlier Bombay State) relates to 1819 Kutch earthquake (Bilham, 1998). As per the verbatim accounts of the 16th June 1819 earthquake in Kutch Bhuj, Anjar, Mandavi, Luckput and all adjoining area suffered severe damages due to earthquake. Bhuj was moist affected with highest number of deaths and property damage. The report said – “The inhabitants quitted the town yesterday, and slept out last night in the plains and about the neighbouring hills.”

Verbatim Accounts of the 16 June 1819 Gujarat Earthquake Rann of Kachchh, India (The Allah Bund earthquake) from Appendix to Bilham (1998) with additional materials Government Documents and Newspaper reports 1819 Phil. Mag. distant felt reports 1820 on 1819 Bhooj earthquake are available on World Wide Web (Colorado). Some portion of the extracts are transcribed from approximately 50 pages of handwritten minutes and letters, sent to and from the Governor’s Office in Bombay, concerning the 16 June 1819 Kachchh earthquake in the days following the event. Captain James MacMurdo was the British representative (Resident) in Kachchh, and in addition to these government reports, he subsequently submitted a collection of papers describing the earthquake to the Literary Society of Bombay. These were published posthumously in Volume 3 (1823).

The data describe severe damage in Bhooj and Anjar (Mercalli Intensity X), and hint at similar damage in many villages of Kachchh. Shaking at Ahmedabad and Surat is less severe (Perhaps intensity 7) and was reported directly to Bombay. In Bombay the event was scarcely felt although it was felt in Nepal and near Madras. This is very useful piece of information (same geographic area but events dates back about 200 years!!) indicating how East India Company, controlled that part of India, acted in the aftermath of 1819 Bhooj earthquake. Excerpt of communication exchange taken place between the collector; residents and other agencies speaks on the extent of damage and approach and attitude of the administration (East India Company) in post earthquake phase.
Excerpt of the correspondence between the resident Bhooj (now Bhuj) and other officials are important historical documents and very relevant to this study as experts have founds technical similarities between 1819 and 2001 earthquake. (Annexure-vii).

The communication exchange between - J. McMurdoo (Resident at Bhooj and Collector at Anjar) Captain J. Pruen (the Commodore at Surat) Chas. Norris (Acting Judge and Criminal judge, Ahmedabad Adawlut 181), Captain James Morgan (Commanding at Anjar) and William Newnham esq.,(Acting Chief secretary to Government of Bombay) reflects on the issues like - extents of damages (Kachchh, Anjar, Mandavi, Ahmedabad, Vadodra, and other areas), assessment on losses, relief operation and funding etc., Verbatim, 1819)
The correspondence shows the approach and attitude of the that time governing agency and administration. Correspondence clearly shows the existence of rigid bureaucracies with equally rigid policies followed by the East India Company. Welfare measure of inhibits perhaps were kept at the end of Governance priority list. No reference could be found on – relief operations and their management except a sanction of Rs 4000 to the East India Co. for the “relief of their distressed subjects” at Anjar! (Refer Annexure IX)

**Indian Famine Code**

Indian Famine code (1883) is another administrative reference on disaster relief measure in ancient time. The Great Famine was preceded by an intense drought (or "crop failure") in the. Earlier, after the Bihar famine (1873-74), in which mortality was avoided, the Government of Bengal and its Lieutenant-Governor, Sir Richard Temple, were criticized for excessive expenditure, which had included the costs of importing rice from Burma and providing generous charitable relief. Sensitive to any renewed accusations of excess in 1876, Temple, who was now Famine Commissioner for the Government of India, insisted not only on a policy of laissez faire with respect to the trade in grain, but also on stricter standards of qualification for relief and on more meager relief rations. Two kinds of relief were offered: "relief works" for able-bodied men, women, and working children, and gratuitous (or charitable) relief for small children, the elderly, and the indigent. The resulting mortality was exceedingly high; in the British areas alone, 5,250,000 people died of starvation or disease. The overall death toll is estimated to be between 6.1 million to 10.3 million people. The excessive mortality of the Great Famine and the renewed questions of "relief and protection" that were asked in its wake, led directly to the constituting of the Famine Commission of 1880 and to the eventual adoption of the Provisional Famine Code in British India. The excessive mortality in the famine also neutralized the natural population growth in the Bombay and Madras presidencies during
the decade between the first and second censuses of British India in 1871 and 1881 respectively (Wikipedia).

The major recommendations of the famine commission (1880) included – (1) that the state should recognize its responsibility of organizing relief in times of famine; but (2) that the administration of the relief should be done “not to check the growth of thrift the self-reliance among the people, or to impair the structure of society which resting as it does in India upon the moral obligation of mutual assistance, is admirably adapted for common effort against a common misfortune; (3) that under the circumstances there fore the relief can be best administered in the shape of work to the able-bodies, and the gratuitous relief only to the disabled; (4) that the employment should be offered before actually the physical efficiency of the able-bodies is wrecked; (5) that the relief work should be a work of permanent utility, and it should be such as to employ a good number of workers for considerable time; (6) that the workmen should be provided with proper medical facility, temporary market and huts to live in; (7) the in the adjustment of wages, the sex, age and class of the person should be given a due consideration, special allowances should be fixed on children, and everything should be re-adjusted from time-to-time (8) that the cooked food being unpopular among people, the gratuitous relief should be in the shape of raw grain and money, with cooked food being reserved for second line of defense; (9) that for distribution of gratuitous relief, the affected area should be divided into circles, each of which should be placed under experienced district officer who should work with the cooperation of the local persons; (10) that for the distribution of relief among the purdah-nashin ladies the committee of Indian gentlemen should be made use of; (11) that except in the exceptions circumstances, the private traders should be given to supply the food requirements of workmen in the open market, though their behaviors and practice should be closely watched; (12) that the land revenue in the affected area should be suspended or remitted as necessitated by the actual circumstances, and loans should be offered for purchase of seed grains and bullocks; (13) that the local landlords should also be encouraged through loans, etc. to provide relief works on their own estates to the distressed tenants and laborers; (14) that wherever required, encouragement and facilities should be provided for the migration of the cattle.
to the grassy forests; (15) that in order to develop a sense of responsibility both in the people and the local governments, the burden of the expenditure should be thrown on the local taxation, the center supplementing the funds only after a careful assessment of the requirements; (16) that to make them responsible for the provision of the major part of the fund, the representative members of the tax paying bodies should be associated with the administration of relief; (17) that in the light of recommendation the relief scheme should be prepared in advance so as to be used without any delay at the time of emergency; and (18) that a provisional famine code be prepared, which may be adopted by the local Governments to fit in their respective requirements subject to the Central control (Chabbra, 2007).

This was considered a mile stone in history of famine relief in India. The proposal was accepted and it was ultimately decided that Rs 15 millions should always in future be provided in the budget, under the head “famine Relief and Insurance”, a part of which may be used for the construction of protective works such as the railways and the canals. It was on the basis of these recommendations that the famine code 1883 was formulated, which guided the formation of various provincial famine codes. The codes thus prepared divided into different parts, the first dealing with measures to be adopted in the normal times; the second dealing with the measures to be followed in case of imminent relief campaign; the third with the duties of different concerns when the relief campaign has already been started; the forth with the manner by which the affected area should be divided into the “scarcity” and famine districts, and their further division into the relief circles; and the rest with certain other connected problem.

Indian Government continued the legacy of same codes and provisions, even after independence in 1947. Government of India’s Calamity Relief Fund (CRF) is nothing but a form of “famine Relief and Insurance” as defined in the Famine code (1883). Gujarat State Relief Rules (Blue book, 1993) reflects the deep rooted influence of the age old famine codes designed and implemented by the British rulers before centuries.
Central Sector Scheme - One of the earliest institutional initiatives in terms of a changing approach was the Central Sector Scheme on Disaster Management, implemented from 1993-94, and focused on disaster preparedness with an emphasis on mitigation and preparedness measures and improving the national capacity to reduce the adverse impacts of natural disasters. The principal activities undertaken involved hazard mapping and vulnerability assessment (e.g., preparation of the Vulnerability Atlas of India); human resource development (establishment of a National Centre for Disaster Management (NCDM) in New Delhi and disaster management cells with dedicated faculties in all the administrative training institutes in the states); upgrading the early warning system and strengthening the seismological instrumentation network; awareness generation; and other related activities.

High-powered Committee on Disaster Management – A High Powered Committee (HPC) on disaster management was established in August 1999 to recommend an institutional system for managing disasters. The committee studied the disaster management system globally and had a series of consultations with all stakeholders. Recommendations were made in 2001 which focused on the need for a holistic effort considering all disasters within a coordinated system of governance. It is this recommendation from the HPC that possibly provided the impetus for the Act of 2005 and gradual establishment of national-level authorities and committees. HPC also provided a model district plan. The HPC also focused on instilling a culture of prevention into the national psyche.

Finance Commission – The Finance Commission is a constitutional body set up every five years to deliberate and recommend measures for devolution of funds, revenues and taxes between the central and state governments. Past Finance Commissions had
addressed issues and concerns of calamity relief, leading to the establishment of mechanisms like the Calamity Relief Fund and National Fund for Calamity Relief over the years. The Eleventh Finance Commission (2000 – 2005) stressed proactive, pre-disaster preparedness planning rather than a mere relief funding mechanism. The Twelfth Finance Commission continued in a similar vein, emphasizing the necessity for integrating disaster preparedness and mitigation provisions into state plans, rather than as part of calamity relief. This commission also emphasized hazard mapping and a transparent relief distribution process and provided states with a total allocation of Rs 21,333.33 crore ($US 4,848.5 million) for calamity relief and Rs 500 crore ($US 1,136,364 approx) for the National Calamity Contingency Fund (NCCF) to be replenished by special duties and surcharges.

Planning Commission – The Planning Commission of India incorporated a separate chapter on ‘Disaster Management – The Development Perspective’ in the 10th Five Year Plan (2002-2007), with the objective of informing, guiding, and providing specific strategies for all state governments on disaster management. The Tenth Five Year Plan emphasized that development cannot be sustainable without mitigation being built into the development process. It provided for preparation of a plan for disaster mitigation for all states and mandated that each development initiative in a hazard-prone area should have disaster prevention or mitigation as a term of reference. This helped bring about a shift in approach from national development to ‘safe national development’ and laid down broad parameters and strategies for information dissemination and research initiatives, capacity building, training and education, community-level initiatives, and institutional arrangements. The Eleventh Five Year Plan reiterated the aim of safe development with integration of mitigation measures into development initiatives.

2001 Bhuj earthquake was an eye opener for governance system, both at National as well as the State level and it was realized that the apparent loss of human life and assets masked insurmountable losses in livelihood, social capital, and economic development. The cost of rehabilitation and reconstruction of a shattered infrastructure and economy
can be enormous and carry over for years. The need for an effective disaster management strategy to lessen disaster impact has increasingly been felt in many quarters. Strengthening of organizational structure of disaster management and reorienting existing organizational and administrative structures have been of prime concern. Several committees constituted by HPC contributed in development of Model State Disaster management Acts, Building codes and by-laws etc. High Power Committee (HPC) constituted by the Government of India, finally, came out with the National Disaster Management Plan (NDMP) in Oct 2001, about nine months after the Bhuj earthquake.

3.5 Research Concerns

Flowing from the above, specific research concerns, which have guided the progression of this research, can be expressed as under –

• Whether the State Government of Gujarat and the Indian National Government were prepared and could respond and manage 26 January 2001 earthquake in Bhuj District?

• Has State Government of Gujarat and the Indian National Government identified and incorporated “lesson learned from 2001 Bhuj earthquake” into the disaster management framework?

• Is the current National Policy addresses management of multi-hazards, with multi-agency involvement, keeping a pace with emergent disaster response management?

• Is Gujarat State Government’s approach toward planning and establishing “emergent disaster management system” objective oriented, adequate & addresses all issues appropriately?

• What impact National / State Disaster Management Policy has created on the performance of Disaster management departments?

• What more need to be done?
3.6 Concluding Remarks

Whereas hazard events cannot be prevented from occurring, devastation and loss can be prevented to a great extent. Impacts of natural disasters can be reduced through pre-disaster activities for mitigating risks; and such activities are among the most crucial aspects of disaster risk reduction to consider in forming a coordinated strategy or plan. Natural hazard mitigation is an important policy issue because ‘monetary losses from natural disasters are reaching catastrophic proportions’ and are expected to increase. Mitigation is arguably the most critical activity of the four phases of disaster management: mitigation, preparedness, response, and recovery (Godschalk et al. 1999). This is particularly relevant in the case of recurrent natural hazards, such as cyclones and floods, in vulnerable locations where action to reduce damage can be more effective than relief and recovery. Earliest literature on disaster management concentrated more on — the “reactive or relief oriented” approach. People and Government will act when the disaster strikes and such incidents were taking as “act of God” by one and all. Advent of modern technology has opened a new chapter in the area of disaster management as it is now possible to monitor, measure, analyze and predict the possible occurrence of these “acts of God” with reference to time and geographical locations more accurately. Next phase will be — rise in the awareness on the need for protecting citizen lives and property inducing concept of “mitigation and preparedness” into the disaster management. Subsequent steps such as — rise of Pro-active Disaster management, its definition, scope, perspectives, stages, evolving legal and organizational issues, scenarios, problem and challenges will follow. On subject domain, a comprehensive discussion on Disaster Management in Gujarat State / India, its structure, organization, problems, issues, and “traditional vs. emerging” approach has been initiated to gain insight about the subject domain and to set the research questions and objectives in proper contexts. There is distinct gap in research. While specific concerns and issues have been adequately highlighted, there is an absence of adequate emphasis on the need for a perspective where under Disaster Management is to be studied with reference to its context, that is,
effectiveness. Disasters caused by human beings have become more and more common in the 20th century. Unlike earthquakes and other natural catastrophes, this "new species of trouble" afflicts persons and groups in particularly disruptive ways. Bhopal tragedy and Three Mile Island are two living examples of that. Modern technological innovations need be used not only for – better preparedness to generate effective response, but also for investigating underlying condition (or root cause) that produce such an unexpected event and to include appropriate remedies so as repetition can be avoided or handled more effectively. Similarly there is a conspicuous absence of the research work on local / State Disaster Management systems and their performance in India. Keeping these gaps in mind research scope, objectives and research questions etc... are formulated and presented in subsequent chapters.