

## **Acknowledgements**

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## **CHAPTER 1**

### **INTRODUCTION TO THE CONCEPT OF FOOD BIO TERRORISM**

#### **1.1 Introduction- Disaster, Vulnerability and Hazards**

India is extremely vulnerable to a large variety of disasters. Approximately 60% of the country's landmass is prone to earthquakes of moderate to very high intensity; over 40 million hectares (12%) of land mass is prone to floods and river erosion; almost 5,700 kms (75%) long coastline is prone to cyclones and tsunamis; 68% of the cultivable area is vulnerable to droughts and many of the hilly areas are at risk from landslides and avalanches. India is also vulnerable to Chemical, Biological, Radiological and Nuclear (CBRN) emergencies and other unidentified man-made disasters.

Disaster risks in India are further compounded by increasing vulnerabilities due to the changing demographics, socio-economic conditions, haphazard urbanization, unplanned development within high-risk zones, environmental degradation, climate change, geological hazards, epidemics and pandemics. Clearly, all these contribute to a situation where disasters can strike any time.

Vulnerability is the susceptibility of being harmed. It could be due to the human factors or natural reasons. The human related factors that increase vulnerability could be intended or unintended, and include apathy, poverty, corruption, illiteracy, land use pattern, technological misuse and terrorism. Poor land use planning and inconsistent emergency management systems may result in floods, droughts, cyclones, earthquakes, heat and cold waves and landslides.

Hazard is an event which is a possible source that can convert into disaster. Hazards in India are spread throughout the country with floods, droughts, cyclones, earthquakes and landslides have been occurring with some regularity. The Himalayan and sub-Himalayan regions, Kutch, Bihar, North East and the Andaman & Nicobar Islands are earthquake hazard prone. India is a country of huge weather differentials. In one part of the country there could be heat wave, while in another part there could be cold spell. Apart from natural hazards, India faces intended and unintended terrorist attacks and technological hazards, which have been increasing recently. Technological hazards include the well-known Bhopal chemical disaster. India is also considered to be one of the most terrorist attack prone countries in the world due to the history of past attacks.

A disaster occurs when hazard interacts with vulnerability. Disasters are no longer limited to natural catastrophes. Man-made emergencies also cause disasters in terms of fatalities and economic losses. Disaster management occupies an important place in this country's policy framework as the poor and the under privileged are worst affected due to such calamities/disasters. India has a long history of disasters- earthquake, cyclones, floods, landslides, droughts, famines, epidemics (natural disasters) and manmade disasters- fires (Uphaar and other tragedies), chemical (Bhopal gas tragedy), technological (Morvi dam tragedy), terrorist attacks (Parliament attack, Mumbai attack, etc) and railway, road and aviation accidents.

The United Nations International Strategy for Disaster Reduction (UNISDR) (2009) defines disaster as:

“A serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources.”

UNISDR considers disaster to be a result of the combination of many factors such as the exposure to hazards, the conditions of vulnerability that are present, and insufficient capacity or measures to reduce or cope with the potential negative consequences. Disaster impacts may include loss of life, injuries, disease and other negative effects on human physical, mental and social well-being, together with damage to property, destruction of assets, loss of services, social and economic disruption and environmental degradation.<sup>1</sup>

The Disaster Management Act, 2005 uses the following definition for disaster:

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

### **1.11 Terrorism**

In the present scenario, the line between man-made disasters and terrorist incidents has become increasingly blurred in multiple cases. Terrorism in its various forms is the greatest disaster as well as a challenge to the Indian state. Terrorism is deeply rooted in the human history all across the world. The terrorist attacks are not new but in fact have become quite common. It is often stated that “One person’s freedom fighter is other person’s terrorist”. So, it can be construed that beauty lies in the eyes of the beholder. Terrorism as a topic is very complex. No single theory or definition can fully describe it. There are multiple factors which result in terrorist activities. Terrorism can be orchestrated by individuals, groups or states; the targets could be random or selective; objective may be espousing of some propaganda or achievement of a goal; the goals itself may be political, criminal or undefined. Despite the confusion caused by the variety of perspectives on terrorist violence, certain common factors can be identified and listed as below-

1. Terrorism involves the use or threat of extraordinary violence.
2. Terrorism is goal directed.
3. Terrorism is intended to have a psychological impact beyond the immediate victims, and
4. Terrorists choose their victims largely for their symbolic, rather than instrumental value. <sup>3</sup>

Encyclopaedia Britannica defines terrorism as,

“The systematic use of terror- such as bombing, killing and kidnapping- as a means of forcing some political, social or religious objects by relatively small group, devoid of popular support”. <sup>4</sup>

US Federal Bureau of Investigation definition specifies that,

“Terrorism is the unlawful use of force or violence against persons or property to intimidate or coerce a government, the civilian population, or against any segment thereof, in furtherance of political or social objectives.”<sup>5</sup>

As Laqueur (1987) observed,

“Terrorism is the use of illegitimate force to achieve political objectives”. <sup>6</sup>

Jessica Stern (1999) defines terrorism as,

“An act or threat of violence against non-combatants with the objective of exacting revenge, intimidating, or otherwise influencing an audience”<sup>7</sup>

There are many other definitions but broadly the points covered under terrorism are as follows

- Used as a tool to achieve political objective
- Use of violence or threats of violence
- Designed to generate fear in the target groups, which may be individuals, groups or property
- Involves non state actors which are generally proscribed
- Targets may be defined or random but it is for a certain goal
- Directed at a wider target than the immediate victims
- May be done with the objective to coerce the governments

The modern industrial societies, with innumerable inventions present opportunities for the terrorist elements to disrupt the normal functioning of the societies. Terrorists, by using violence, can impose catastrophic consequences to a scale comparable to the natural disasters. Such violence can be diverse. Impact of chemical, radiological, nuclear and biological disasters can have far reaching consequences affecting more than one generation. Terrorist activities may be said to have begun in the 1<sup>st</sup> century BC itself but, it is widely known only since the French Revolution in the late 18<sup>th</sup> century. The last century saw numerous freedom struggles around the world which had taken a violent turn, many of which have been categorised as terrorist activities. The first documented act in recent history was hijack of an airline in Peru in 1931. Thereafter sporadic incidents have kept on occurring. The sensational attacks on the Israeli athletes in Munich Olympics in 1972 captured the attention of the whole world. Due to regularity of attacks, terrorist activities have gained greater worldwide focus in the past few decades only. Events like end of the Cold War in the 1980's had acted as a catalyst in some form or the other. It brought within its wake new forms and dimensions of the phenomenon which were earlier unimaginable. Events like the

US World Trade Centre attacks in 2001, Mumbai attacks of 2008, Train bombings in Spain, Moscow theatre attack, Nerve gas attack on Japan subway and other recent incidents of mowing down pedestrians in London, Nice, Paris, Barcelona, New York, Melbourne, etc. have brought about a paradigm shift in the way the world now looks at the threats of terrorism. The highly co-ordinated attack of September 2001 in New York was very sophisticated in terms of its conceptualisation and precise execution. Although the preparedness and reaction of the law enforcing agencies have since increased manifold, terrorist attacks have occurred in various countries with depressing regularity.

Terrorism has progressively become more extreme and violent. (Chalk 1999:164)<sup>8</sup> Modernisation and globalisation have like the economy, impacted terrorist activities also. In another way we can say that globalisation of terrorism through internet and other modern gadgets has become possible due to advances in science and technology. This has enhanced the sophistication and finesse with which the phenomenon is being constantly re-invented and widened in its reach. Terrorists have been employing variety of approaches to accomplish their desired ends using assorted techniques.

The number of incidents may have decreased, but the number of deaths and injuries has increased as also the loss of property. It shows that the strike rate of the terrorist elements has improved. This may be because of a combination of factors including their better planning & preparedness; better preparedness of the security forces and other ameliorative steps taken by the governments in concert with other states.

### **1.12 Models of terrorism**

The violence and destruction associated with terrorist activities evokes strong reactions and responses. As it has assumed different forms, its precise definition and categorisation is somewhat difficult. However, by and large the terrorist activities can be categorised into the following six models-

1. *Revolution or the National liberation model*- these are generally low intensity campaigns which grew during the early to mid 20<sup>th</sup> century when the freedom struggles were going on around the world.

2. *Civil Disorder model*- it was the product of the domestic political strife in the 1960s and 1970s.
3. *Law Enforcement model*- the focus is on creating law and order problems for the ruling dispensations/regimes.
4. *International Conflict or Surrogate Warfare model*- these are extension of the traditional mode of conflicts between nations
5. *Human Rights or Repressive violence model*- it is a tactic adopted by the incumbent regimes to protect their political privileges.
6. *Vigilante model*- these are variations of the repressive model with a minor difference that these actions are not supported by the regimes, but by the groups supporting these regimes.

### **1.13 Concept of Bio-terrorism**

According to the U.S. Department of Health and Human Services (DHHS) bio-terrorism is “the use or threatened use of biological agents or toxins against civilians, with the objective of causing fear, illness, or death.”(Bray and Konsynski, 2006:560)<sup>9</sup>

Bioterrorism is a specific form of terrorism involving the deliberate environmental release of pathogens (viruses, bacteria, parasites, fungi, or toxins) causing illness or death in people, animals, or plants.<sup>10</sup> Dissemination is accomplished through the release of aerosols, as an addition to an explosive, as a food borne substance, through deliberate human interaction, through a vector, zoonotically or through food and water contamination. It is a deliberate introduction of an animal or plant disease with the goal of generating fear, causing economic losses, and/or undermining social stability.<sup>11</sup>

Food terrorism has been defined by the World Health Organisation (2002) as, “An act or threat of deliberate contamination of food for human consumption with chemical, biological or radio-nuclear agents for the purpose of causing death to civilian populations and/or disrupting social, economic or political stability”.<sup>12</sup>

Nestle (2003) defines food terrorism as “the deliberate poisoning or contamination of the food supply to achieve some political goal”.<sup>13</sup>

Food Bio terrorism can be described as the use or threatened use of contaminated or poisoned food against civilians, with the objective of causing fear, illness, or death and most significantly for political reasons. The food hazards can broadly be categorised into three categories-

- Global hazards- disease like mad cow, which can have global repercussions due to its trade.
- Regional hazards- contamination in some drug causing widespread damage. Its impact is restricted in its wideness.
- Local hazards- adulteration in some local eateries. Its impact is very restricted.

It may also happen that the damage may begin at one small location and quickly spread to other areas. In general, food hazards or threats can be considered as follows:

- (1) Biological and chemical terrorism
- (2) During crises or disasters, and away from proper food safety control in such situations, genetically modified food can be sent to such areas in purpose to test a "new product" on human.
- (3) Using incorrect information on labels for imported or exported food cans or articles.

## **1.2 Statement of the problem**

National Disaster Management Authority (NDMA) of India has issued detailed guidelines and Standard Operating Procedures (SOP) to deal with various types of natural and man-made disasters in the country. But there are no guidelines and instructions for intentional disasters caused by Bio-terrorism. Hence efforts have been made to get the views of government officials, doctors and common people. This study describes the status of awareness and the preparedness by various agencies in dealing with such occurrences, including the civil & police administration and the medical fraternity.



### **1.3 Objectives**

- 1.31 To understand the subject of Bio-terrorism and its status in India.
- 1.32 To study the possible attack of bio-terrorism and the socio-psychological impact on the victims.
- 1.33 To study the preventive steps taken/ preparedness and response mechanism set up by the government agencies and awareness amongst the common people.

### **1.4 Limitations of the Study**

The subject of food bio-terrorism or deliberate contamination of the food chain is very vast and responsibility for dealing with such cases is nebulous. There is no clear cut distinction of division of responsibility amongst the agencies. Moreover, there are numerous other agencies involved in the administrative process. On top of it there is very little literature available or study done in this field in India.

Considering the time constraints, the scope of this study has been limited to the NCR region only. Doctors and policemen from Delhi/ Gurugram/ UP could be interviewed in the process and some responses from people from various walks of life have been obtained online from far off places like Agra, Meerut, Allahabad, Saharanpur, Bareilly, Lucknow, Goa and Bengaluru. One response has also been obtained online from Spain. Due care has been taken to involve people from different categories, age groups and professions in the society and many responses have been received from them in the process of the study.

### **1.5 Review of literature**

There are very few books, guidelines or instructions on how to tackle bio-terrorist attacks in India. In fact, many people are not even aware of this problem. Terrorist attacks in various forms have been occurring in India since long. Due to the strong political will exhibited by the government, the security agencies have achieved tremendous successes. Although the frequency of attacks has shown a decreasing trend, the terrorist elements are finding newer ways to impose harm on the Indians. Deliberate Food contamination or food bioterrorism in an organised way is one of the options which can be employed by them in future. It will also not be

easy to identify the source of any such attack due to the very nature of the attack. Thus, the challenges are increasing by the day.

Waugh, Jr. William L. (1990), in his book *Terrorism and Emergency Management- Policy and Administration*, has given detailed descriptions of the terrorist activities, model steps taken to control them and shown the readers how to adapt current crisis management models to develop anti-terrorist policies. The book focuses mainly on the actions taken in the United States. It has evaluated the emergency management models and prescribes how they should be established. Barriers to establishing such systems have been described. The potential for large scale terrorism exists especially nuclear, chemical and biological. It mentions that over emphasis on police or military to tackle such actions may prove to be counter-productive and attention needs to be given to broader disaster preparedness and mitigation programmes. The author has suggested that an Emergency Management Agency need to be established which will be entrusted with the overall responsibility of dealing with such emergencies and will be the Lead agency for anti-terrorism programmes. Such an agency will need considerable expertise and lot of funding to keep the system operating. The effectiveness of this agency is yet to be tested. The response of the US Government to the terrorist activities has also been discussed in the book in detail.

Kaferstein F. and Abdussalam M. (1999) in their article “*Food Safety in the 21<sup>st</sup> century*” have argued that the global importance of food safety is not fully appreciated by the public health authorities despite a constant increase in the prevalence of food borne diseases. Epidemiological surveillance has demonstrated a constant increase in the prevalence of food borne illness. They have argued that, both, traditional and new technologies for assuring food safety should be improved and fully exploited.

Nwoko Kenneth Chukwuemeka (2001) in his article “*Food Terrorism in Nigeria: Fears, Possibilities and Action*” conducted a study of the impact on Nigeria’s food production and distribution. He also studied the Nigerian Emergency Response capabilities and concluded that the threat of food terrorism in Nigeria no

doubt is more real than imagined. However, he mentioned that the Nigerian government will need to act in tandem with others to control this growing challenge.

Khan Ali S, Swerdlow David S and Juranek Denis D (2001), have argued in their article “*Precautions against Chemical and Biological Terrorism directed at food and water supplies*”, that deliberate food and water contamination remains the easiest way to distribute chemical and biological agents for the purpose of terrorism despite the national focus on controlling it. They have mentioned that such acts have already occurred in the US. They state that although major gaps exist but technological advances have covered many such gaps and better equipped the enforcement agencies.

Mishra Sudhir (2002) in “*Bioterrorism: A Brief Study*” published in the Central Bureau of Investigation (CBI) Bulletin described the historical perspective of the terrorism which acquired a new dimension due to introduction of biological and chemical agents in the terrorist attacks. He has mentioned various biological agents with their consequences. The two greatest agents are anthrax and small pox, both highly lethal. He argues that proper planning and preparedness are required to counter such threats and the public health infrastructure will need to be strengthened in order to combat bioterrorism.

Sobel Jeremy, Khan Ali S. and Swerdlow David (2002) in “*Threat of a biological attack on the US food supply: the CDC perspective*” argue that deliberate contamination of food with biological agents has already been perpetrated in the USA. As numerous channels are involved in production and distribution, preparedness for a bioterrorist event affecting the food supply entails augmentation of the public health infrastructure to enhance disease surveillance, accelerate capacity of laboratory detection, diagnose, rapidly investigate and control outbreaks and develop capacity for response to mass casualty disasters.

Meyerson Laura A. and Reaser Jamie K. (2002) in their article “*Biosecurity: Moving toward a Comprehensive Approach*” have argued for a comprehensive approach to bio-security in order to minimise the risk of harm caused by non-native organisms to agriculture, economy, environment and the human health. The approaches to bio-security in the USA and other countries have been reviewed. The

authors argue that risks of bio-security breaches will continue to rise and the consequences may become more frequent and severe as environmental change, globalisation, technological developments and social stresses increase. To afford true protection, policies, regulations and management strategies must be implemented through a comprehensive approach only to be successful.

Lachance Paul A. (2003), in his article, "*Nutraceutical/drug/safety assurance through traceability*" has argued that the consumer has a right to microbiological safety and prevention from adverse exposure to hazardous chemicals. Significant safety through traceability can be assured by the coupling of the technologies of the Global Positioning Systems (GPS), bar/chip coding and Hazard Analysis Critical Control Points (HACCP) management, coupled to rapid nanotechnology marker assays which are under development process.

Dyckman Lawrence J. (2003) in a Testimony before the Committee on Governmental Affairs, US Senate titled, "*Bioterrorism- A Threat to Agriculture and Food Supply*" mentioned that bioterrorism attacks could be directed at many different targets in the farm to table continuum, including crops, livestock, food products in the processing and distribution chain, wholesale and retail facilities, storage facilities, transportation and food & agriculture research laboratories. Studies have found many gaps which make the chain vulnerable although the US Department of Agriculture and Food and Drug Administration have stepped up their prevention and response efforts. They recommended certain measures to plug these loopholes.

Applebaun Rhona S. (2004) in "*Protecting the Nation's Food Supply from Bioterrorism*" has stated the challenges being faced by the food industry in the aftermath of the 2001 terrorist attacks in the US and how the threat needs to be taken seriously. She has argued for accurate risk assessment, potential threat and vulnerabilities. As the risks cannot be eliminated 100% but only managed, Companies must develop their own security policies for the purpose. The National Food Processors Association (NFPA) is working to assist the industry in organising and conducting food and plant security assessments in the US.

Manning L., Baines R.N. and Chadd S.A. (2005), in their article "*Deliberate contamination of the food supply chain*" published in the British Food Journal have

highlighted how food contamination, whether accidental or deliberate, can have far reaching impact on individuals, organisation and the whole food supply chain. They concluded that food terrorism will cause severe economic disruption by direct losses as the culling of the livestock will have to be done and compensation will have to be paid to the farmers. It could also lead to consequential losses to the local and national economy, loss of consumer confidence in the food supply chain and loss of political confidence and support. There will be serious health consequences for the consumers of such items too.

Stinson Thomas of the Applied Economics Department, University of Minnesota, US (2005) in "*The National Economic Impact of a Terrorist Event: Preliminary Estimates*" has done an impact study of the terrorist acts.

Azaam Mohamad , Sekheta F., Abeer H. Sahtout, Sekheta Farid N., Pantovic Nela and Omari Ayham T. Al (2006) in the article, "*Terrorist Threats To Food & Water Supplies and the Role of HACCP Implementation as One of the Major Effective and Preventive Measures*" have argued that contamination of food and water supplies for the terrorist purpose is real and current threat. They have introduced the concept of the International Food Terrorism and have discussed possible ways in which the terrorist elements can target the food chain by using chemical or biological agents right from the farm to the final stage of consumption. They have suggested steps for developing a security plan and mentioned that the prevention and response are the two main strategies for countering the threat to food terrorism.

Patial Brig. M. S. (2006) in "*WMD Terrorism- Strategy for Consequence Management*" has conducted a detailed study of the strategy of consequence management. It contains action taken by the responders in case of Nuclear, Chemical and Biological disasters. Role of the Specialised Response Assets in the US and the role of Armed Forces have been given. Little has been said as to how the local administration or the scientist community needs to be prepared to handle such emergencies. Policies of the government have also not been enumerated. Role of media in such emergencies has been described in detail.

Monke Jim (2007) in a report presented by to the US Congress titled, “*Agro Terrorism- Threats and Preparedness*”, stated that there is a distinct possibility of terrorist attacks on the agricultural sector and the threat is a real one. Food defence has been receiving increased attention in the counterterrorism and bioterrorism communities of late. According to the report, laboratory and response capacity are being upgraded to address the reality of agro-terrorism, and national response plans now incorporate agro-terrorism.

Solodoukhina Dina (2011) in “*Food safety Bio terrorism and Bio terrorism from public health perspective*”, had studied two Russian regions on the perception of risk related to food safety by consumers. She presents the view from the public health perspective. She gives an overview of the problem focusing on agricultural sector as a particularly vulnerable element in the farm-to-table food continuum, describing the possible scenarios of bio-terroristic attacks and the necessary preventive activities to be undertaken to provide food safety.

Kohli C. And Garg S. (2015) in “*Food Safety in India: An Unfinished Agenda*” have introduced the public health hazards of food safety issues and have argued that public awareness should be a part of any initiative. They have delved upon the current scenario and the legislative emphasis laid on ensuring food security in India.

Yang Hanzhou (2017), in his article published in the TCI-Tarina Policy Brief No. 5 –May 2017 title “*Food Safety in India: Status and Challenges*” has mentioned that due to increasing globalisation, urbanisation and economic developments, the eating habits of Indians have changed and they are seeking greater variety of foods. Indians are getting more concerned about food safety and security. The most vulnerable sections are the middle and the lower class. TCI is studying the existing laws and recommending to the government that appropriate measures be taken to ensure food safety and security. It argues for greater responsibility to be delegated to private laboratories. Awareness is lacking and needs improvement.

Norton Robert A. (2017) in “*How Current World Threats May Impact Food Safety*” has stated that North Korea has been developing the capability of biological weapons and it requires preparation at the local levels. Provisions must be made for

complete surveillance of animal production areas and perimeter areas. Food security must be made more robust and the US must be smarter and more vigilant than its adversaries.

World Health Organisation in “*Terrorist Threats to Food- Guidance for Establishing and Strengthening Prevention and Response Systems*” details that the Member States require alert, preparedness and response systems that are capable of minimizing any risks to public health from real or threatened food terrorism. This document provides policy advice on strengthening existing emergency alert and response systems by improving links with all the relevant agencies and with the food industry. This multi-stakeholder approach will strengthen disease outbreak surveillance, investigation capacity, preparedness planning, effective communication and response.

The Ministry of Home Affairs, Government of India has also issued detailed Disaster management guidelines which have laid out the institutional and policy framework for the disasters and their mitigation. National Disaster Management Authority (NDMA) also issues guidelines and instructions regularly for various disasters prevention, preparedness and mitigation. They will be studied during the course of the study.

### **1.6 Research questions**

The following research questions will be addressed during the course of this study-

- 1.61 What is the concept and policy regarding food bio terrorism?
- 1.62 What is the level of preparedness of agencies involved in dealing with such events?
- 1.63 What further steps need to be taken to strengthen the existing system and how they can be improved?

### **1.7 Methodology**

Primary data was collected by conducting personal interviews and getting questionnaires filled from the government officials, police personnel in Delhi and nearby regions, civil administration, doctors, common man, press persons, legal officials and students.

Secondary data was obtained from literature survey and online articles to understand the policy of the Indian government and action taken by various foreign governments. It is important to mention here that there are very few books and articles available in India on this topic.

A structured questionnaire was provided to the respondents which included civil administration officials, policemen, central armed police personnel including National Disaster Response Force (NDRF) personnel, doctors, teachers and professors of law, judicial officers, doctors working in the government hospitals and private hospitals, students and press personnel. The objective was to assess the level of awareness and preparedness in case of any emergency. These questionnaires have been analysed and the findings have been incorporated in the study.

### **1.8 Chapterisation scheme**

The overall chronology of the chapters will follow the systematic order of understanding the problem, the government initiatives and policies, parameters for preparedness, evaluation of such preparedness from the point of view of the responders, discussion with the responders, analysing the questionnaires and responses, conclusion and recommendations.

### **1.9 Materials and methods**

The study seeks to analyse the existing level of awareness among various sections of the society. Level of preparedness of different governmental agencies, especially those in the NCR region have been studied. The guidelines of Ministry of Home Affairs and National Disaster Management Authority have been analysed. Efforts have been made to acquaint with the Trauma centre of the All India Institute of Medical Sciences (AIIMS) and Ram Manohar Lohia Hospital (RML), New Delhi.

Guidelines in this regard have been issued by international and national agencies like World Health Organisation (WHO) and National Disaster Management Authority (NDMA) respectively. In India, the apex agency, NDMA has issued detailed guidelines and Standard Operating Procedures (SOP) for prevention, preparedness and mitigation of natural and man-made disasters. Similarly, the state



governments have issued guidelines and instructions as a follow up. At the international level, it was observed during the study, the level of awareness and preparedness is extremely high. The US government has been regularly conducting studies in this regard and many hospitals have issued guidelines like HOPE (Hospital Preparedness and Emergency Response).

Every situation is different and what may succeed in one may not in another. The level of resistance of human beings and the society also differs from one place to another. However, best practices may be copied and even improved upon. Any Disaster preparedness plan should clearly identify the agencies and their roles. These should be unambiguously communicated to the respective agencies, which need to check and rehearse them in minute details.

Apart from the visit to the hospitals, police stations, NDMA, National Disaster Response Force (NDRF) headquarters, National Institute of Disaster management (NIDM), data and views were also gathered from many journals and articles published in journals, books and newspapers. Media reports were also checked, internet was surfed and many videos exhibiting the process of adulteration of food were analysed during the process.

## **CHAPTER-2**

### **DISASTER MANAGEMENT IN INDIA- AN OVERVIEW**

#### **2.1 Historical perspective in India**

During the British administration, relief departments were set up for emergencies during disasters. Such an activity-based setup with a reactive approach was functional only in the post disaster scenarios. The policy was relief-oriented and activities included designing the relief codes and initialising food for work