Chapter 9
A Holistic and Proactive Approach for Effective Management of Financial Crisis

9.1 Introduction

The holistic and proactive approach to effective management of financial crisis arising out of disasters envisages consideration of disasters from the point of view of probability of their occurrence in a particular locality/region, vulnerability of the concerned locality and the ill-effects as well as the losses caused due to disaster impacts. While doing so, this approach calls for the consideration/implementation of each of the pre-disaster phases of disasters management i.e. preparedness, prevention, mitigation to a greater extent as compared to the rehabilitation activities. It also seeks harmonized contribution of all the stakeholders in the disaster management process. A holistic approach to disaster management seeks coordinated initiatives from an all-round perspective.

As per the findings of the Special Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation (Srex) of The Intergovernmental Panel on Climate Change (IPCC), climate change has already led to changes in climate extremes, such as heat-waves and heavy precipitation in the past half century. Climate extremes, or even a series of non-extreme events, in combination with social vulnerabilities and exposure to risks, can produce climate-related disasters. In view of this, the world will have to follow an approach that combines adaptation measures with reduction of emissions of greenhouse gases to be able to enable limiting the extent of climate change and associated impacts. Strategy to avoid, prepare for, respond to and recover from the risks of disaster can reduce the implications of these events and increase the resilience of people. These impacts in the nature of extreme events and disasters not only have humanitarian aspects but financial consequences as well.

As per the Statistical Yearbook of Asia and the Pacific 2011, natural disasters have inflicted sizable reparation costs. Expansion of fiscal spending has increased over the changing needs of ageing populations and evolving requirements for public services, social welfare policies and infrastructure investment. It has been observed that global weather and climate-
related disaster losses reported over the last few decades reflect mainly monetised direct damages to assets, and are unequally distributed. They do not take into account loss of human lives, cultural heritage, environmental aspects which are difficult to monetize. Thus it can be observed that the monetised losses in the developing countries are understated. But the fatality rates and economic losses expressed as a proportion of GDP are higher in developing countries.

As regards manmade disasters, the threat of terrorism, unrest and warlike situation have become a hanging sword for majority of the countries. The flow of money to and from these illegal activities has a potential to disturb the economy of any country. With the advent of science and technology, the impacts of industrialization, urbanization and consequent pollution has also become a cause of concern.

A coordinated approach for risk estimation and communication between decision-makers and local citizens is hence needed to minimise the damage, losses and wastages arising due to both natural and manmade disasters.

### 9.2 Coordination in Disaster Management Activities

Disasters cause huge human and economic losses. They can have devastating effects on the economy and can significantly affect the development and wellbeing. With the kind of economic losses and developmental setbacks that India has been suffering year after year, the development process needs to be sensitive towards the aspects of disaster preparedness and prevention. There is thus a need to look at disasters from a development perspective as well. This calls for coordination among all stakeholders.

Coordination in responses to disasters is not simply a specific set of actions rather an approach to emergency response that attempts to maximise the benefits and minimize inefficiencies as well as wastages. It involves various stakeholders such as the government, Corporate sector, NGOs, international organizations, civil society and affected communities coming together to provide an appropriate, efficient and inclusive response to disasters. This involves coordination and collaboration through different phases of the response including planning, operations, data collection, information management, resource mobilization and resource allocation etc.
There arises a complexity in coordination as a result of sheer enormity of urgent as well as important tasks involved in disaster response – rescue operations, relief provisions, issues of access to the affected population/individuals, threat of secondary disasters, influx of various stakeholders such as NGOs, Corporate Sector, international organisations and individuals interested to assist the disaster affected families, policy directives, long term sustainability strategies, political issues and information as well as resource management. All these factors have to be managed in an appropriate and time-bound manner. Coordination is a critical success factor for organizing adequate disaster response and recovery as well as for successful disaster risk reduction. It can help ensure that resources are allocated properly avoiding duplication, plugging gaps, responding to efforts as well as building collective focus on sustainable recovery and long-term risk reduction. Coordination can be used to ensure a response that is appropriate to the socio-cultural, economic and geographic context of the disaster situation. Disasters are threat to the global economy and it will not be possible to curtail financial losses and achieve sustainable development without integrated efforts in this direction.

9.3 Challenges in Effective Coordination While Managing Disasters

1) During disasters, apart from lack of resources, lack of coordination among various agencies and an absence of role clarity amongst various stakeholders pose serious challenges.
2) There is no systematic and scientific approach for assessing the disaster damages, losses & needs.
3) There is a tendency to overestimate or inflate some of the damages by some sectors, while at the same time there is also under-estimation of the damages in some sectors.
4) The damages in some sectors are sometimes not being considered at all.
5) Many times only the direct losses due to disasters are estimated and considered and the indirect losses or long term secondary ill effects are ignored or under-estimated.
6) There are heightened vulnerabilities to disaster risks due to expanding population, environmental degradation, unplanned urbanization, industrialization, etc.
7) Within the vulnerable groups, elderly persons, women, children, physically challenged persons, etc., are more likely to bear the brunt of disasters and therefore require special attention during response. In the response phase, children orphaned and women rendered...
destitute on account of disasters deserve special attention. However, efforts in this direction are very few.

8) The response of citizens to disasters will depend upon their own resiliency level which may differ from person to person or communities to communities. The resiliency level mostly depends on the disaster training undertaken, age, educational level, financial condition and other preparedness of affected people.

9) When the disasters affect more than one country, there might be problems in coordination of response and mitigation activity and information sharing.

10) Many a times the governments take various initiatives for disaster management. However, the loopholes in these initiatives are unearthed only when the disasters strike.

11) Economic growth may jeopardize safety especially in the poor and developing countries of the world as economic activities can result in environmental degradation and deforestation which disrupt environmental balance leading to disasters such as droughts and floods. This may also lead to warlike situation among nations for acquiring more and more natural resources.

12) Disaster risk is a function of hazard and vulnerability. Many a times the efforts may be focused on preventing the hazards but equally important is the reduction of vulnerability. Vulnerability to disasters is not simply due to poverty or living under unsafe conditions, but it is caused due to a multifarious range of economic, social, political and environmental factors.

13) The socio-economic problems such as poverty and inequality of wealth often render the weaker individual or society more vulnerable. It is observed that these problems hamper the capacity of coping with disasters and ultimately result in heavy losses.

14) The disparity of geographical and weather conditions makes a particular region more or less prone to a particular disaster, e.g. seismic zones or flood plains etc.

15) Due to the lack of a standardised and synchronized approach to damage estimation and relief provision there is unnecessary duplication of efforts or lack of efforts and funding which causes delays in response and Rehabilitation initiatives in the aftermath of disasters.

16) The poor or developing countries may find it costly to have disaster management offices, equipments and personnel.
17) The bureaucratic hurdles in the affected country create obstacles in the facilitation of humanitarian assistance including delays in the granting of visas, the import of relief goods and equipments etc.

18) Lack of knowledge about the culture and social life of the affected population can cause hindrance while approaching them.
9.4 **Review of Major Recent World-Wide Initiatives to Build a Holistic and Proactive Approach**

Several initiatives were taken at the international level for coordination of disaster management process to bring effectiveness in it. Some of the significant recent initiatives are as follows:

1) **Initiatives of United Nations**

The following are the major agencies of the United Nations attempting to standardize disaster management at an international level:

a) **United Nations Development Program (UNDP)**

Disasters compel the available resources, which otherwise could have been used for development to be redirected towards the disaster management. The accumulated losses from the disasters are concentrated disproportionately in the most vulnerable sectors of the poorest countries. To help these nations the UNDP has a Crisis Prevention and Recovery office known as a Bureau of Crisis Prevention and Recovery (BCPR), which shapes the organizations response to disasters.

b) **United Nations Office for Coordination of Humanitarian Affairs**

In order to improve the overall effectiveness of the disaster management during conflict as well as during natural and manmade disasters, the United Nations General Assembly appointed an Emergency Relief Coordinator as the Secretary General of the Department of Humanitarian Affairs whose function would be to coordinate the activities of the UN during disasters. It also created the Inter Agency Standing Committee, the Consolidated Appeals Process and the Central Emergency Revolving Fund as the key coordination mechanisms and tools of the Emergency Relief Coordination. The mandate of the Department of Humanitarian Affairs was expanded to include the coordination of humanitarian response, policy development and humanitarian advocacy.
c) International Search and Rescue Advisory Group
International Search and Rescue Advisory Group, an intergovernmental network under the United Nations, was established in the year 1991 for doing urban search and rescue and related disaster response issues.

d) United Nations Disaster Assessment and Coordination (UNDAC)
It is an additional and standby mechanism of professionals having expertise in Disaster Management, engaged in carrying out rapid relief work and providing information on disaster situation to the international community.

e) International Decade for Natural Disaster Reduction (IDNDR)
The United Nations General Assembly designated the year beginning from 1990 to 1999 as the International Decade for Natural Disaster Reduction to create awareness, arrive at standards and use the existing knowledge, wealth and human resource for preventing, mitigating and effectively responding to the disasters. The decade aimed to curb the human, material and economical losses caused by disasters. It was also the aim of the decade to bring an integral approach to natural disaster management.

f) Inter-agency Framework for the International Strategy for Disaster Reduction
UN General Assembly and the Economic and social Council launched International strategy for Disaster Reduction (ISDR). An interagency secretariat was created to serve as focal point within the UN system in 2000. The ISDR was launched by the General Assembly to give a boost to the international standard setting processes in order to reduce human, social, economic and environmental losses caused due to natural, technological and environmental hazards.

g) United Nations Decade for Education for Sustainable Development (2005-15)
The declaration aims at disaster risk reduction through revision of teaching curricula at all levels and the use of other formal and informal channels in order to reach youth and children with information so necessary as to effectively prevent and mitigate disasters.

2) South Asian Association for Regional Cooperation (SAARC) agreements
The SAARC, which was established in 1985 have entered into many treaties to prevent, mitigate, rehabilitate and provide relief in the event of a disaster. It carried out studies in respect of the measures to protect and manage the environment and measures and programs for strengthening disaster management capabilities.

3) Yokohama Mid-term Review of IDNDR (23-27 May 1994)
Upon review of progress of IDNDR, emerged the Yokohama Strategy for Safer World. The main recommendations that came out were

(1) Broaden the dialogue related to disaster relief, environment and development,

(2) Institutionalize the growing culture of meaningful partnerships between national authorities, regional outfits, NGOs, private firms, etc., to ensure that prevention, preparedness and mitigation measures become an acceptable part of the development process.

4) The Geneva Mandate on Disaster Reduction
The participants representing different countries in the IDNDR International Forum held at Geneva in the year 1999 drafted the Geneva Mandate on Disaster Reduction recognizing that the world is increasingly being threatened by the large scale disasters, which will have long term social, economic and environmental impacts. This mandate calls for adopting and implementing policy measures at the international, regional, sub regional, national and local levels for establishing hazard resilient community.

5) Tampere Telecommunication Convention
This Convention required the signatory States to provide unhindered use of telecommunications during disasters.

The declaration resolved to intensify cooperation to protect the vulnerable, save our common environment and reduce the number and effect of both natural and manmade disasters.

7) World summit on Sustainable Development, 2002
The Johannesburg Plan on sustainable development, paragraph 37, advocates for a holistic and proactive multi-hazard all-inclusive approach to address vulnerability, risk assessment and disaster management including prevention, mitigation, preparedness, response and recovery for a safer world in the 21st Century.

8) Bonn Conference on Early Warning, 2003
The conference sought effective early warning systems through strengthening of coordination and cooperation among all relevant sectors and actors in the early warning chain.

9) Mauritius Strategy for Small Island States, January 2005
It gave a call for enhanced commitments to reduce the vulnerability of small island states, as they usually have inadequate response capacity.

World Conference on Disaster Reduction held in Kobe, Hyogo, Japan during 18-22 January 2005 threw up a framework for action for the decade 2005-15. The priorities set for the decade include enhancement of international and regional cooperation, emphasis on a holistic and proactive multi-hazard approach to risk reduction, recognition of cultural diversity, empowerment of communities and local authorities, promotion of the culture of prevention, and recognition that every disaster is also an opportunity and disaster risk reduction is a cross-cutting issue. The Hyogo Framework identifies the need to promote the development of financial risk-sharing mechanisms, particularly insurance and reinsurance against disasters, as a priority action for building the resilience of nations and communities to recover after disasters.
9.5 Integrated Approach: An Indian Perspective

India is a large country with an area of 32,872,633 sq. kms. extending from Himalayan region to the tropical rain forests of the South region. The heavy concentration of rainfall within a span of three months in most of the areas causes heavy run-off and high floods. With the rising urbanisation and concentration of industrial activities in mega cities like Mumbai, the risk of urban flooding has become a usual feature. Non-availability of moisture over most parts of the year, particularly in the arid and semi-arid regions, renders around 68 per cent of the land-mass of India vulnerable to drought. The tectonic plates of Indian sub-continent make it vulnerable to frequent earthquake disturbances.

The Asia Pacific Region faces over 60% of the world's natural disasters. India, on account of its geographical position, climate and geological setting, has had a fair share of these disasters. One or two cyclones strike the peninsular region of the country every year. Similarly, floods are a regular feature of the Eastern India. The Himalayan mountain ranges are a continuing cause of concern for their high vulnerability to earthquakes, landslides and avalanches. The parts of the country such as Kashmir and other regions on the border are exposed to terrorist activities. Though the government had achieved success in many areas of internal security, naxalism continued to be a serious problem in the north-eastern states. The incidents such as the terrorist attack in Mumbai in 2008 and bomb blasts in Pune in 2011 and 2012, point to the need for much more work in the area of national security.

Disasters disrupt progress and destroy the outcome of developmental efforts over several years, often pushing nations in quest for progress back by several years. Thus, efficient reduction of disaster risks, rather than mere response to their occurrence, has in recent times, received increased attention both within India and abroad. With a vision to build a safe and disaster resilient India, the Government has adopted a holistic, proactive, multi-hazard oriented and technology driven strategy by promoting a culture of prevention, mitigation, preparedness and response.

Keeping in view the vision articulated under the Disaster Management Act, 2005 for building a safe and disaster resilient India, the Disaster Management Policy was announced in 2009. The institutional structure outlined in the Disaster Management Act 2005 and the National
Policy on Disaster Management (NPDM) essentially promotes the new holistic and proactive approach to disaster management without disturbing the other mechanisms that exist in the country. The NPDM, prepared by National Disaster Management Authority (NDMA) and approved by the Cabinet in October 2009, was released by the Prime Minister of India on 10th January, 2010 at the NDMA meeting. The NPDM enunciates the national vision of a safer and disaster resilient India where the process of holistic and integrated disaster management will hinge on the community, with momentum and sustenance through the collective efforts of all government agencies and NGOs. The Policy also enunciates community based Disaster Risk Reduction (DRR) through participation of civil society stakeholders, to be coordinated by the State Disaster Management Authorities (SDMAs) and District Disaster Management Authorities (DDMAs). The States continue to have the primary responsibility for disaster management with the District Collector, Deputy Commissioner or District Magistrate as the case may be, acting as the real disaster manager on ground. The Act and the Policy emphasize the accountability factor for different actors. The NPDM clearly lays down the roles and responsibilities of stakeholders in disaster. The Policy also seeks the involvement and contribution of NGOs for owner-driven reconstruction (ODR) in post-disaster situations. The role of NGOs, Community Based Organisations (CBOs) and other stakeholders has been recognized as potential partners in the NPDM. In the recent past, the orientation for handling disaster situations has been changed from a relief-centric to a holistic, multi-dimensional and multi-disciplinary approach involving diverse scientific, engineering, social and financial processes. The new approach encompasses the entire gamut of disaster management activities, i.e. prevention, mitigation, preparedness, response, relief and rehabilitation. This approach stems from the conviction that development is not sustainable unless disaster mitigation and response is mainstreamed and inbuilt into the development process.

In India, private sector engagement in post disaster situations, especially in distributing relief assistance to disaster affected communities as a part of their Corporate Sector Responsibility (CSR), needs to be augmented with special emphasis on strengthening pre-disaster preparedness and mitigation in disaster-prone areas with the help of local NGOs. The Bhopal Methyl Isocyanate (MIC) gas leak highlights the need to prepare Off Site Disaster Management Plans covering aspects of preparedness, mitigation, disaster risk reduction and
response in industrial units that deal with hazardous chemicals. It also encourages the NGOs to work for awareness generation, empowerment and training of communities for disaster risk reduction. Setting up a Functional GO-NGO Coordination Platform during nonemergency times will ensure that appropriate coordination happens during response operations and development interventions.

From the above discussion, the following 9 point model of Holistic and Proactive Approach for Effective Disaster Management can be envisaged:
9.6 Holistic and Proactive Approach for Effective Disaster Management

(Diagram drawn by the researcher)

Figure 9.1
Conclusion

The model of Holistic and Proactive Approach for Effective Disaster Management emerges as a base on which a holistic and proactive approach can be envisaged to minimize the wastages and losses arising due to disasters if the approach is implemented in totality. This model focuses on minimizing the financial ill effects of disasters on the country.

Components of Holistic and Proactive Approach for Effective Disaster Management

A) Comprehensive legal and constitutional framework

i) Building a National culture for safety and resilience:
   Effective disaster management calls for comprehensive legal and constitutional framework for preparedness, prevention, response, mitigation and rehabilitation activities encompassing the role of all the stakeholders such as Government, Corporate Sector, NGOs and citizens of the country. There is need to imbibe a national culture for safety and resilience. After a disaster, the enforceable right of people to get the relief and rehabilitation needs to be recognized. Powers and responsibilities of emergency managers need to be expressly mentioned and there should be proper allocation and management of finances which should be need-based. There should be appropriate punishment for violating the provisions of law/orders/directions. A framework of insurance, loans, advances and compensations in respect of disaster preparedness/mitigations/rehabilitation needs to be given increased importance.

ii) Effective Grievance redressing Mechanism:
   In the immediate aftermath of the disasters, there is a situation of panic and fear. The antisocial elements take benefit of this situation. Hence, an effective grievance-redressing mechanism and protection of Human Rights need to be treated as an integral part of the disaster management planning.
iii) Streamlining Role specification of the stake holders and their preparedness:

Many a times it is observed that the interface between stakeholders and the disaster management framework is backed by legislative measures (e.g. Disaster Management Act), decisions, such as those taken for establishment of the bodies/committees for managing disasters and the government orders taken out to execute these decisions. They also define the composition of the structure and the role to be performed by each stakeholder by identifying the stakeholders to be involved in the disaster management framework. However, the stakeholders are also required to understand their role and its significance. This can be streamlined at the planning stage by careful role specifications and arrangement for sufficient training/practice/mock drills in a time bound manner. The relevance based interface emerges when stakeholders lie at the impact end of the disaster and therefore are required to undertake policy measures to deal with those impacts.

iv) Planning for cross-border disasters:

In case if the disasters affect more than one country, effective rules and regulations and least number of administrative barriers are needed for coordinating the cross border issues. Many of the disasters are small/medium-scale emergencies, for which the tools of the international system may be ill equipped to deal with because of the fairly cumbersome appeal process that must be completed before significant resources can be mobilized. Hence, there is a need for more flexibility in this regard.

v) Setting of a standard legal platform:

A clear, compatible and flexible legal agenda at both national and international platform is an essential measure in the efforts towards a proactive approach in all phases of disaster management. Standard setting becomes imperative at all levels from international community to local community level to prevent, mitigate and rehabilitate as the case may be. The instruments in respect of implementation mechanism can be legal or non-legal. These instruments include
vi) On-going review mechanism and periodic amendments:

There is a need to have a review mechanism in place to continuously assess the effectiveness of the current measures and implement changes if any in light of the changing economic, commercial and social scenario at national as well as international level. While framing the policies, the focus should be on the aspects such as regional and geographical vulnerability, climatic variations etc. and not only on the long term changes carried out on an average. There is need to have cohesiveness among all the laws and policy decisions the focus being need based.

B) Accuracy and Standardisation in Data Collection and Analysis

i) Data Comparability:

Many a times, it is observed that there is a large amount of disparity between data collected from different sources and by different organisations. Also, the data may contain only the direct costs of disasters in many cases. Due to this the data becomes incomparable and hence fails to highlight important observations. It also fails in tracking trends in the various aspects of disaster management. There are various limitations of the disaster databases in India. It is not easy to collate scattered databases for comparative analysis. Data/ Information are available with different departments. Details of the small, medium scale or long term events may not be available. Different departments use different formats for entering data. Information captured may not be tuned for hazard vulnerability analysis.

ii) Information Standardization:

Low-income and developing countries maybe faced with a diverse range of donor-driven research programs that may weaken national priorities. One of the major challenges as noted in a review completed by the WHO Mediterranean Center for Health Risk Reduction is the diversity of information i.e. which organisations hold the information and what purpose it is collected for.
This applies across the spectrum of activities, in risk assessment, hazard prevention, vulnerability reduction, mitigation, preparedness, operational response and recovery measures. In order to provide useful and reliable disaster data, there is a need for adequate database structures, standardized methodology and operational approaches, and interoperable data formats.

iii) Training for data collection, coordination and analysis:

The data becomes meaningful and useful information only when it is organized, tabulated and analysed accurately. The data may not be efficiently coordinated, organized and utilized by field staff. Many countries are facing significant challenges in training and retaining researchers. A critical factor that further compounds this challenge is the limited development of and/or partial or total collapse of systems for routine information collection and analysis as a result of a disaster. Compromised information systems restrain the process of prioritization at all levels, limit the capacity to detect, analyze and monitor trends and hinder evidence informed priority setting and resource allocation.

iv) Comprehensive Research Framework and its application in financial policy framework:

There is a need for a consensus on a global operational research framework and to promote a sustainable research and knowledge generation capacity to define user driven, evidence-based best practice. Improved data on past disasters would help inform investment and policy decisions and thus help secure more appropriate levels and forms of disaster preparedness, prevention, response and mitigation. An effective data collection and storage mechanism in respect of past disasters would improve disaster management efforts. Availability of timely and accurate data goes a long way in boosting the policy initiatives. The strengthening of disaster databases will eventually serve the global, international, and national humanitarian communities involved in disaster response planning and risk reduction. Improvement of disaster analysis, as well as increased visibility and access of disaster data, need to be focused specifically on smaller, intra-country scales and on an expanded scope, by including human and economic impact indicators. As regards man-made disasters such as terrorism, the FICCI Task Force Report on ‘National Security and Terrorism’ indicates the need for agency with all India jurisdictions as a central system for intelligence gathering, analysis and dissemination of information. It further suggests the formation of National Intelligence grid, as an integrated model of information
sharing. It also suggests that the intelligence information must be efficiently converted to 'actionable' and reach the right 'actioning element' speedily.

C) Effective Assessment and Documentation of Disaster events

i) Documentation of Disaster Events:

The frequency and intensity of both manmade and natural disasters and the warlike situation in some countries highlight the significance of the disaster data from the point of view of financial planning for recovery in the short term and redevelopment in the long run. The data regarding the casualties, injured people and property losses etc. needs to be maintained in an accurate manner.

It is observed that documentation of disease outbreaks and the public health after-effects of natural disasters such as cyclones and flood etc., is lacking many a times. Disasters cause financial impact and efforts should be made to analyse and assess the same. Hence it is required that there should be policies laid down in respect of the documentation and record keeping in respect of disasters. Only documentation of data is not sufficient. It is required that the same should be maintained properly so that in case of any kind of planning, insurance claims or reimbursements it becomes a basis.

ii) Disaster Loss Assessment:

Disaster loss assessment is the estimation of losses arising as a result of a catastrophic event. The information regarding both the direct as well as secondary impacts is required to be documented so that the loss assessment can be done effectively. It is a critical element of disaster management, as the techniques and estimates of loss assessment support the risk management process. The assessment of the impacts of disasters and their analysis throws a light on future path of action. The lessons learnt from the past events may guide us to plan effectively from the point of view of the future disasters and take appropriate decisions in time of disasters. These reports can also form a basis for loss assessment and insurance payments. For effective assessment of a disaster event it is imperative to have accurate documentation of the event on some predefined and accepted standards. It is important to develop mechanisms for more efficient assessment and documentation of disasters especially natural disasters. Timely
assessments and reassessments are required to be done in order to gauge the impacts of disasters accurately.

**iii) Usage of technology:**

Effective disaster management requires accurate and timely information, which is utilized for a number of vital tasks: risk assessment and preparedness before a disaster; response, rescue and mitigation activities during a disaster and recovery and rehabilitation post disaster. Efforts are being made to make a use of satellites in this regard, and efforts have been made to address the gaps between the experimental and operational uses of such information and relevant decision-making tools. A comprehensive assessment of impacts of natural disasters on agriculture requires a multi-sectoral and integral approach involving key organizations. The effective assessment and documentation of a disaster event forms a basis for the effective strategy in this respect. It also goes a long way in estimating the requirement of funds and other resources for the rehabilitation/recovery stage. The disaster management program should be equipped to create an integrated database for this purpose.

**iv) Standard setting for Multi-year and multi-country disasters:**

The international database on disasters EM-DAT observed that the slow-onset and spatially complex nature of drought make its documentation particularly difficult, which led to irregularities in the documentation of drought disasters in EM-DAT. One such issue stems from the fact that drought disasters are often documented over many months or over more than one Year (i.e., multi-year event). This has been typically handled by creating a database entry for the drought in all years for which impact reports were available. It was not uncommon for a single drought disaster event to then have more than one start time and, consequently, be counted as more than one event. Drought can also affect large areas regardless of geopolitical boundaries. A similar issue therefore arises when a drought hazard occurs in more than one country (i.e. multi-country case). Previously, this type of event would receive an entry in the database for each country in which drought-related impacts were reported and, like the multi-year event described above, could cause the single hazard event to be counted as multiple disaster events. Both multi-year and multi-country events posed difficulties in documenting and accounting for the associated losses, in addition to the timing and location information.
v) Training for effective assessment and documentation:

The investigation and documentation of disaster events requires a specialized manpower. Hence specific training needs to be given in this regard so that this activity can produce reports that can be effectively used for loss assessment, loss accounting and future planning. After the occurrence of disaster event, it is necessary to document complaints for presentation to the authorities. It is necessary to have a standardisation of the manner in which this information is collected in order to have complete and accurate information. A volunteer team needs to be trained to register complaints that are represented and follow them up.

D) Continuous Initiatives for Research and studies

i) Initiatives for Research and Studies:

There are various factors that change the shape and focus of disaster management programs in different time periods and in different regions. For e.g. at the request of the Indian government, the World Bank conducted a study to develop a robust analytical framework for simulating the long term impacts of drought at the micro (drought-prone areas) and macro (state) levels. To create a framework, the Bank carried out a quantitative probabilistic risk assessment of the impacts under different scenarios, and assisted the government in the development of a forward-looking and anticipatory strategy for adapting to frequent drought events and conditions of water deficit. The probabilistic drought risk assessment model was developed to estimate the economic impact of drought and to assess the effects of different drought mitigation strategies and climate change scenarios.

There is a need for setting up disaster management training and research institutions. Exploring integration would require the disaster management framework to build its research capacity, in terms of specialised research institutions and enhanced expertise in the field of disaster management, which can provide substantive inputs to various development sectors.

The FICCI task force report on national security and terrorism states that even if the cost of terrorism represents a somewhat little portion of the overall economic risks in India, it could
have serious impact on productive capital across the country. Terrorists not only kill people but also seriously destroy infrastructure, industry, and ultimately hurt the confidence of both the common man and the investor. Given the serious security challenges that our country confronts, FICCI believes that Indian business needs to invest larger amounts in research and analysis, and continue the efforts in building resilience in response to the challenges posed by natural and manmade disasters.

**ii) Practical applications of research findings:**

In order to minimize the financial ill effects of disasters, priority should be given to supporting research with practical applications. Research is needed to understand the physical and biological factors that contribute to disasters but if its findings are not incorporated in the planning process it loses its relevance. For effective disaster management, the findings need to reach to the various stakeholders. For e.g. as compared with the flow of information for disaster management framework, the information on climate change does not have a proper dissemination channel. Most of the times, this information stays with the research and scientific organisations and does not reach the levels where adaptation interventions will be required. Often, the information is generated and simply recorded and communicated as data observations, thus lacking practical applications. There is a need for practical application of loss reduction techniques on the basis of research findings.

**E) Proactive measures for Infrastructure Development**

**i) Investment in Infrastructure Development:**

Natural disasters have an intense impact on the quality of life through due to the destruction of food crops and livestock, shelter and other infrastructure such as houses, shops, roads, bridges etc caused by them. Disasters cause forced displacement of households and communities. For example the earthquake and Tsunami in Japan resulted in a nuclear crisis and severe infrastructure damage and the flooding in New Orleans and Hurricane Sandy led to severe infrastructure destruction, disruption to normal life and social unrest. In India the devastation caused by Bhuj earthquake and the 2004 tsunami cannot be forgotten. The destruction of Hotel
Taj caused by the terrorist attack took lot of time and investment in reshaping the hotel and other places.

Losses resulting from natural disasters are particularly severe in the Asian and Pacific region. This results in diversion of resources which could otherwise be used for economic and social development. The impact is most severe and dreadful in the under developed and developing countries of the region, which have sometimes had their progress objectives set back years as a consequence of major disasters. The lack of infrastructure intensifies the problems during disasters which highlights the need for investment in Infrastructure development.

Investment in disaster management infrastructure falls into two categories: (a) investment in infrastructure to support sustainable socioeconomic development; and (b) investment in infrastructure for reconstruction and recovery.

In view of the significance of good and efficient infrastructure, which is a base for all industrial and commercial activities and civilization, the investment in advanced technologies and improved applications can yield a positive return on the investment.

ii) Regional Cooperation for Infrastructure development:

As per the UNESCAP report, the level of regional investment in infrastructure development during the past 15 years has been much lower than the economic value of the infrastructure damaged by natural disasters in developing countries. Regional cooperation for disaster management, including infrastructure development, is essential, not only to cope with the impacts but also to help ensure that the region sustains its economic growth. Most of the times, urban and industrial infrastructure is planned and built according to elaborate rules and standards established by regulatory authorities. Rising population, urbanization and industrialization demand availability of better infrastructure. Ensuring that such infrastructure is safe is a major issue for governments and industry as it is required that the infrastructure remains operative after natural and other disasters to ensure rapid recovery. Disaster Reduction strategies
can become effective through land use planning, use of construction codes and adoption of good environment protection practices. In India, some regions still do not have even electricity and/or telephone connectivity. Medical support, road transport and other infrastructural developments are required to be improved in many areas. This results in rising fatalities and economic costs in case of occurrence of disasters. With increasing population and imbalance in urbanization, there is a rising tendency to shift to urban areas from rural areas. The concentration of population in some regions increases the risk of losses due to disasters. For this, assessment of existing buildings, houses, shops and other structures and their strengthening should be carried out within a definite timeframe and initiatives should be taken to assess the need for infrastructure adequacy.

The priority for enhanced regional cooperation in disaster management will be on rebuilding infrastructure and investing in infrastructure for disaster prevention and preparedness. The increasing socio-economic impact of regional disasters necessitates the development of knowledge-based disaster management. It is important to develop multi-hazard early warning systems to ensure the efficiency and sustainability of programmes, but in each sub-region these could focus on the main threats in order to maximize the benefits of synergy. While developing the physical infrastructure it is required to keep in mind the environment protection aspects. This will be necessary not only for disaster management but also for socioeconomic development. Regional cooperation is therefore proposed to develop guidelines, including procedures and criteria for physical infrastructure development. E.g. Urban development planning undertaken by the Ministry of Urban Development, which is a part of disaster management framework, also takes into account disaster management concerns while preparing the city development / land use plans at the city level, and setting policy directives at state and central levels. However, such integration needs to be taken up at a wider scale and newer linkages should be explored.

**iii) Need for proactive infrastructure:**

The rate of urbanisation and importance of cities as economic hub is ever increasing. According to the United Nations report of World Urbanization Prospects (The 2011 Revision) the world's urban population is expected to increase by 72% from 3.6 billion in 2011 to 6.3
billion in 2050. All of the expected increase in the world population will be concentrated in the urban areas of the less developed regions, whose population is projected to increase from 2.7 billion in 2011 to 5.1 billion in 2050. As per this report, in 2025, Tokyo is projected to remain the world’s most populous urban area, with almost 39 million inhabitants, followed by Delhi in India with 33 million inhabitants and Shanghai in China with 28.4 million inhabitants. Mumbai in India would come next, with almost 27 million inhabitants. Similarly, the increases in the world urban population are concentrated in a few countries, with China and India together projected to account for about a third of the increase in the urban population in the coming decades. In addition, the megacities in India (Delhi, Calcutta and Bombay) and in China (Shenzhen, Beijing, Guangzhou, Shanghai) plus Manila in the Philippines are expected to grow considerably faster. Rising urbanization increases the pressure on the infrastructure and thus has an ever-expanding need for better and proactive infrastructure. The concentration of economic activities in urban areas has consequences such as environmental degradation and deforestation. This disrupts environmental balance leading to disasters such as droughts and floods. The above findings highlight the need for effective and sustainable infrastructure in order to avoid economic losses caused due to disaster.

As far as the corporate sector is concerned, the Business Continuity and disaster recovery processes are laid down by many companies in order to have a proactive infrastructure to safeguard assets and human resource. However the number of such companies is less in developing countries like India. The approach towards this issue is generally ad hoc as against the proactive approach. In Indian perspective, where probability of both types of disasters are same whether it is natural or manmade (e.g. Assam/Bihar floods and Mumbai terrorists attack), the necessity for having a proactive infrastructure is a need of an hour.

F) Regional aspects

i) Approach to overcome geographical vulnerability and climate extremes:

Owing to the geological and climatic conditions, India is one of most vulnerable countries of the world as far as natural and other disasters are concerned. Due to the natural
characteristics of various regions of the country, the regions are prone to disasters such as floods, drought, cyclones, earthquake and landslides etc. Though Global methods are adopted for determining vulnerability of Regions / Area under consideration, one should consider local context of disastrous situation. For example, many areas of Gujarat & Maharashtra are prone to high flood and water logging, whereas, many areas of Andhra Pradesh & Orissa are prone for Cyclone. The Himalayan region is prone to earthquakes. People staying in coastal areas are vulnerable to river flooding, and coastal inundation following heavy rains, cyclone or tsunami.

In a holistic and proactive approach, the focus should be on regional problems of different nature and intensities. Setting up and usage of early warning systems, land-use planning and ecosystem management and restoration, such as in the case of mangrove plantations can be used to address issues arising out of vulnerability and climate extremes. This should be done with a view to conserve and improve the natural resources in a particular region.

The best example that can be cited here is that of the initiative taken by Dr. Rajendra Singh in Rajasthan. In Rajasthan, very less or no rainfall is the main reason for drought. As a result of this, the State Government of Rajasthan had declared several rivers as ‘dead’. This situation led to lack of food grains and employment opportunities causing financial impacts. Dr Rajendra took several initiatives through his organization Tarun Bharat Sangh(TBS) to conserve water with such a meager rainfall. He played an important role in the building of 8600 johads (water harvesting structures) in 1058 villages spread over 6500 sq.km. Out of these 3500 were built by TBS and the community was motivated to build 5100 structures. For these 5100 structures only technical help was provided. The area covers parts of the districts of Alwar, Dausa, Sawai Madhopur, Karoli and Jaipur districts. Johads and the other appropriate water structures have also been built in the districts of Jaisalmer, Ajmer, Udaipur and Bharatpur. As a result of these efforts five seasonal rivers in the northeastern Rajasthan area, that had nearly dried up have now become perennial. These rivers are Ruparel, Arvari, Sarsa, Bhagani and Jahajwali. The efforts towards water conservation have had numerous positive impacts on the communities inhabiting the area. Employment opportunities have increased and migration has reduced substantially. Studies have shown manifold increase in the enrollment of students in school and output of food grains and milk production. During the last few years, the State Governments of Madhya Pradesh, Haryana, Uttar Pradesh, Maharashtra and Karnataka have sent
their forest and watershed officials and community and Panchayat Raj representatives to TBS for an orientation on community based watershed development efforts. These kinds of efforts are required to be strengthened at various regions with contribution of Government, Corporate sector, NGOS and citizens of the country.

ii) Initiation of conflict resolution and harmony augmentation mechanism:

As regards the manmade disasters such as terrorism, the foreign jehadi groups have shifted their strategy from attacking the northeast and Jammu and Kashmir to targeting sensitive and strategic targets in India's heartland. Outside Jammu & Kashmir, the externally-sponsored jihadi terrorists have been focusing mainly on metro cities such as Mumbai, Delhi and Jaipur, Ahmedabad and Bengaluru. These mass casualty attacks have the objective of shaking the confidence of common citizens as well as foreign investors and businessmen. Their aim is to fuel sectarian tensions, undermine confidence in India's developing economy and create unrest. In its Task Force report on ‘National Security and Terrorism’ FICCI has suggested measures such as adopting strong 'Immediate Response' mechanism, tailor-made terrorism prevention and incident management drills for each metro city and immediately undertaking vulnerability assessment to identify areas and establishments requiring necessary security measures. The report further observes that insurgency has also threatened India's growth and development by undermining the stability of strategically important regions that are rich in mineral and energy resources, including coal, iron ore, manganese, and bauxite. The report highlights the fact that the absence of a conflict resolution mechanism has made the situation grave. For instance, In regions where the social security mechanisms are absent especially in the backward tribal regions of Andhra Pradesh, Bihar, Chhattisgarh, MP and Orissa, the Maoist insurgents have increased their influence exploiting the long-standing and unattended grievances of tribal population and landless poor. They have emerged as the alternate to democratic and administrative instruments denied to the affected people.

G) Capacity building at individual, societal and corporate Level

i) Coordinated response:

Identifying the fact that disasters pose complex, short term as well as long term problems, they require coordinated and effective responses. They require an integration of skills and capabilities between governments, corporate sector, non-governmental organizations, and
individuals. For e.g. In the aftermath of a catastrophic event, while government authorities and corporate sector can focus on the restoration of services, transportation, infrastructure and other financial issues post disasters, NGOs and other voluntary groups of citizens can provide various services such as provision of food, shelter, medicines and psychological support to affected individuals and families.

**ii) Development of the resiliency level:**

If the response to any disaster is planned and the stakeholders are trained, there will be no scope for ad-hoc measures and the response will be effective. For this, there is a need to assess and develop the resiliency level of citizens. The resiliency level will indicate their capability to respond to both natural and manmade disasters effectively. Once the resiliency level is ascertained, steps can be taken to improve the same with proper training by focusing on the weak areas and sections. Along with awareness campaigns, disaster training programs and continuous practice and mock drills of rescue and first aid methods is a need of an hour. There is a need to spread awareness amongst the masses regarding the government relief available, giving information regarding the various relief measures announced by the government. Since major impact of the natural disasters is on poor farmers with limited means in developing countries, community-wide awareness and education programs on natural disasters should be a priority.

**iii) Adaptive Strategies:**

Adaptive strategies can be built from long term perspective to achieve reduction of risks and vulnerabilities. There is a need for capacity building through continuous reduction of risk and impact of disasters. It is essential to build safe and resilient communities by enhancing the use of and access to knowledge and information in disaster preparedness, prevention and management at all levels of society.

Climate change structure in India functions through a large network of institutions working on climate change and related themes. Owing to the obligations under the international commitments, there are vibrant international links established on climate issues. However, there is a lack of coordination among different setups and the stakeholders to address climate change issues, leading to fragmented approach. The capacity of disaster management framework needs to be enhanced to be able to incorporate adaptation concerns and that of climate change network.
for providing substantive inputs to the disaster management initiatives. This would be possible by undertaking extensive capacity-building in the common interface organisations.

iv) **Capacity building initiatives:**

Capacity building initiatives need to address areas such as developing institutional capacities in terms of the structure that can facilitate linking and knowledge sharing, developing personnel expertise, providing a legislative basis that not only supports an institutional structure for addressing climate change adaptation and disaster management, but also integrates an accountability structure and defines the nature of interface between the stakeholders. Programs for improving prediction methods and dissemination of warnings should be expanded and intensified. Efforts are also needed to determine the impact of disasters on natural resources.

Preparing to respond to a catastrophic event usually involves training and practice to ensure that key local employees of the disaster management function and supporting resources are ready to jump into action quickly and that the citizens understand their roles and responsibilities in preparing for and responding to disasters. Kriger, who has worked in number of disaster response and recovery operations with and for the Federal Emergency Management Agency (FEMA), says actions taken during the response phase can have an impact on overall results once the community moves into recovery. For disaster management to be successful, all the preparations should be done effectively which include readiness of equipments and personnel. For that to happen, dedication and discipline are required. It is observed that NGOs play a great role in all phases of disaster management. It is required to encourage NGOs, especially to those which are involved in imparting disaster management training to be efficient and effective by making the appropriate information, material and expertise available to them.

v) **Effectiveness and innovativeness in economic revival:**

In the process of reconstruction, simple, cost effective, research based technology that is easily adaptable should be chosen. Efforts should be made to make use of the old and used materials thereby avoiding wastage and minimize the expenditure of reconstruction. It is needed to make use of the materials produced by village industries and rural community in order to boost the rural economy. Initiatives should be taken for skill development and up-gradation of
traditional skills. In its ‘Long-Term Community Recovery Planning Process: A Self-Help Guide’, FEMA outlines a recovery approach that calls attention to a community-driven process with significant public involvement and local control. While building a capacity at individual, societal and national level, the commitment of all the stakeholders to the cause of disaster management is very important.

In the aftermath of disasters, getting the local economy working again is vital for regaining normalcy. Revival of the economic functions depends on a number of factors:

- A willingness and capacity of business to resume operations quickly
- An availability of appropriate environment and amenities e.g. houses, medical help etc. for workers
- Employers with business continuity plans who can get up and function quickly to restart the economic activities
- Strong association between government and business to facilitate a recovery partnership.

Bruce Moeller, city manager of Sunrise, Florida, says open communication with the business community is essential. Kyle Hayes, city manager of Beaumont, Texas, which was hit by Hurricane Rita in 2005 and more recently by Hurricane Ike, notes that businesses ramped up quickly in both cases, which helped sustain the local economy. Because 35 percent of Beaumont’s revenue comes from sales tax, the rapid recovery of retail businesses was essential to community recovery. In Northwood, North Dakota, city officials met with all the local businesses right after the tornado to identify needs and figure out how to encourage local rebuilding.

vi) Measures for awareness and preparedness:

As far as the manmade disasters such as terrorism are concerned, awareness and preparedness is the main solution. While the terrorists may proclaim their war on the government, their immediate targets mostly are private businesses and innocent people. The terror attacks in India are meant to be public statements against the growing global confidence in India as a stable, emerging economy with competitive and merit-based business opportunities. The terrorist attack of 2008 shows that India needs to put in place a strong response mechanism
to combat terrorism. The existing framework does not specify the role of many players, especially the private sector and civil society in fighting terror. The 26/11 Mumbai attacks and the rising tide of Maoist violence have definitively changed the ways in which both the commerce and industry deal with such violent events. Business resilience and business continuity management despite terror attacks are the best contributions that the business community can make to defy terrorism. In its Task Force report on ‘National Security and Terrorism’ FICCI has suggested to incorporate private sector and civil society into India’s war on terror. It further suggests to bring greater efficiency and effectiveness of local police stations that would enable them to play their role in counter-terrorism and build a professional modern police unit free from extraneous pressures in all states and as well as the Central police forces. Coastal police need to build more coastal police stations. The report suggests that the coastal patrolling should be monitored by the coastal police who need to be trained in maritime policing roles. The force needs to be empowered with improved infrastructure and human resource to carry out its task. Indian fishermen need to be actively engaged as the eyes and ears of coastal security.

H) Population vulnerability aspects

Population growth, poverty, land shortages and urbanization in many countries have increased the number of people living in areas prone to natural disasters and multiplied the public health impacts. In the aftermath of disasters, outbreaks of infectious diseases may be observed when the disasters cause a large population dislocation into unplanned, unhygienic and congested shelters, with limited access to food, clean water and medicines. Disease outburst may also result from the damage of water/sanitation systems and the degradation of sanitary conditions due to the disasters such as earthquakes, floods or tsunamis. Hence, while planning in terms of future disasters, after the Hazards of Disasters are identified, vulnerability of the Region / Area under Consideration should be analyzed. This refers to estimation of probability of occurrence of disastrous situation based on various methods – Past observations, mathematical model, Astronomical forecasting, simulation models etc.

Rapid population growth in Asian and Pacific countries is driving people with low incomes to settle in squatter areas in large cities, usually occupying the low lying flood-prone areas, unsteady hillsides or other disaster-prone marginal locations owing to the high cost of suitable accommodations and other infrastructure and services. In Bangladesh, for example,
around a million people are living on islands formed by silt deposits and in vulnerable flood plains and coastal areas. More than 85 per cent of the population of China, the country that has highest population in the world lives on alluvial plains or along river basins concentrated in one third of the country’s total land area. Land degradation and desertification pose a serious threat in the wake of growing populations and enhanced food demand. A comparison of desertification in different continents indicates that the Asian and Pacific region is most severely affected by loss of land productivity and agricultural output, although Africa has the highest percentage of desertified dry land.

India's population grew 17 percent in the last decade and now stands at 1.21 billion (approx.). That's more than the United States, Indonesia, Brazil, Pakistan, Bangladesh and Japan put together. The density of population in India (2011) is 364 persons per sq km and ranks second among the most densely populated countries of Asia following Bangladesh (849 persons).

The human related factors that increase vulnerability of India include poverty, illiteracy and other demographic factors. Certain aspects, important from the point of view of disaster planning are as follows:

i) **Poverty:**

As per the Press Note on poverty estimates, 2009-10 (Government of India, March 2012), 33.8% rural population and 20.9% urban population are below the poverty line in India. The poverty coupled with inequality of wealth in India makes these people vulnerable not only to natural disaster but also to the manmade disasters such as terrorism. They are easily susceptible to illegal activities due to the want of money. They are exposed to various kinds of natural disasters as they do not have the required coping mechanism.

ii) **Illiteracy:**

The literacy rate in India is 74.04 percent as per the 2011 census. The male literacy rate is 82.14 percent and female literacy rate is 65.46 percent. This rate is much less than many countries such as USA, UK and even Asian countries like Japan where it is almost cent percent. Due to the lack of education, it becomes very difficult for this section of population to understand the causes, ill effects and measures in respect of disasters. Their illiteracy becomes a
major hindrance in grasping the disaster management plans effectively. Due to the low economic level caused by the low level of education, this population has to work in risky and unhygienic conditions. Also the vulnerability of women combined with the low literacy rate increases disaster impacts.

**iii) Gender perspective:**

Many a times it is observed that women and men differ in how they experience, respond to, and recover from disasters. Men and women have different abilities and ways of responding to a disaster as a result of which the disaster impacts are different. It has been observed that women are more vulnerable than their male counterparts of the same social classes, races and age groups during all phases of a disaster. According to the UN, women are disproportionately affected by disasters, because of social roles, discrimination, poverty, illiteracy and vulnerability to violence. As per the latest Census in the year 2011, the total female sex ratio in India is 940 per 1000 males and the female child sex ratio is 944 girl children per every 1000 boy children of the same age group. Therefore, while planning for disaster management more attention needs to be given to the challenges faced by women. Rather than perceiving women as victims, they should be treated as capable and equal actors and their skills, capabilities and contributions should be recognized while making a disaster management plan. They should be participated in the planning and decision making process. Men, too, can be harmed by gender-based social expectations, especially in the aftermath of disasters. Socially and culturally, they are expected to deal with their own losses and grieve alone. The formal aspects of psychosocial support bypass men, since, according to stereotypical views, they are expected to be strong and face the crisis bravely. While there may be specific interventions to help widows and female-headed households recover, the concerns of widowers who are left with the responsibility of raising young families are often not addressed.

Because of their different role definitions and life experiences, men and women can complement each other when contributing to risk reduction and disaster management. Good practices of gender-inclusive DRR observed across the globe are evidence of this.

**iv) Perspective of elderly and physically challenged:**

People with age-related or physical or mental disabilities have different needs in different phases of the disaster management cycle. They need training and support to learn techniques to save themselves. They need to get the information, and require special rescue techniques,
transportation and shelter. Although they are among the most vulnerable, many a times their
disability differences and their specific needs are not recognized while planning and policy
making. They are neither included in any decision making processes nor are they invited to
participate in committees or practices to manage disasters nor is any funding earmarked for
meeting their needs.

v) Perspectives of children:

As per the 2011 census, 13.12% of the population in India is of the age group between 0-
6 years. As per UNICEF’s report on ‘UNICEF and Disaster Risk Reduction’in 2010, children
typically represent 50-60 percent of those affected by disaster. Children are directly affected by
death and injuries as well as from diseases related to malnutrition, poor water and sanitation-
conditions that are exacerbated by disasters. In addition, disasters disrupt education and can
cause psychological trauma. Disasters also separate children from their families and increase
vulnerability to trafficking, exploitation and abuse. Climate change impacts are projected to
increase the numbers of children affected by disasters from an estimated 66.5 million per year in
the late 1990s, to as many as 175 million per year in the coming decade.

vi) Heterogeneity of Population:

Given its diverse population, location and the newfound position on the global canvas, India
is among the key targets of a host of terrorist groups—from foreign jihadi groups to the tribal
insurgents of northeast and the Maoists. Terrorism has the capability to cripple economies,
inhibit welfare and create unforeseen global crises. The year 2008 exhibited that terrorism and
internal insurgencies remain the biggest threat to our national security, our businesses and our
way of life. Such continual increase and spread of terrorist attacks across India indicates
ineffectiveness of measures and investments made towards national security in recent years.
Unless drastic measures are taken, there can be no assurance that India will be able to prevent the
next major terrorist attack, and to reassure the global investor of the safety of the funds.

The above list of vulnerabilities is not an exhaustive one and the relevant vulnerable areas
are required to be found out in order to achieve a holistic planning. Also, the undisciplined habits
of citizens such as throwing the garbage on the road, not following the traffic rules and other laws, carelessness, negligence etc. cause obstacles while achieving a disaster management culture. Even though currently various NGOs, other organizations and citizens are working to find solutions and to imbibe the concept of disaster management in various sections of the population, at the times of disaster, the need is felt for intensifying these efforts. However, the united efforts of Government, NGOs and Corporate sector go a long way in reducing the vulnerability of population.

I) Financial initiatives

Review of Financial Initiatives

Financing long-term disaster recovery poses significant challenges for local leaders and businesses which rely on the state and central government as an important source of disaster recovery funds. The financial crisis becomes severe when funding is urgent and not optional. Hence an integrated framework for financing long-term recovery improves the odds of success when a disaster occurs. Strategies that can be put in place well before a disaster include (1) understanding all financial requirements for response and recovery grants, and the required documentation for reimbursements; (2) identifying all potential sources of funding for long-term recovery; (3) establishing lines of credit to provide cash flow for direct expenses till the grant is given and (4) identifying internal staff, or external resources, or both, to manage the financial implications of recovery. Understanding of resources and the rules governing access to those resources is essential to maximize funds to support long-term recovery.

When disasters strike, countries with limited economic resilience often seek assistance from the international donor community or divert funds from development projects to cover emergency and recovery needs. Even though the importance of catastrophe risk financing is recognized, catastrophe risk markets remain hampered by market imperfections that limit their expansion, particularly in developing countries. Funding for relief and reconstruction in developing countries generally comes from very different sources than is the case in industrial countries. In more advanced economies, losses from natural disasters are typically funded through a combination of private risk financing arrangements and an efficient public revenue system. In middle- and low-income countries, which have relatively low tax ratios and ongoing fiscal pressures and where catastrophe risk markets are often underdeveloped, funding sources
for post-disaster reconstruction tend to be more varied, with strong reliance on ex-post borrowing and assistance from international donors. In addition, the lack of immediate liquidity in the aftermath of a disaster often hinders recovery and forces the government to conduct an emergency budget reallocation, which can be detrimental to the long-term fiscal activities and investments.

More than 40 percent of the direct losses from natural disasters are insured in developed countries, usually through compulsory insurance. On the contrary, it is estimated that less than 10 percent of these losses are covered by insurance in middle-income countries and less than 5 percent in low-income countries. To help countries reduce their reliance on post-disaster external assistance, the World Bank supports a country risk financing framework. This risk management approach relies on the identification and assessment of the government’s contingent liability in case of natural disasters, and on the financing of this liability using market-based financial instruments. With sufficient liquidity following a disaster, key government officials can immediately focus on recovery and not be distracted by having to close short-term funding gaps. In addition, catastrophe risk management can assist countries in the optimal allocation of risk in the economy, which may result in higher economic growth, better mitigation, and more effective poverty alleviation.

Post-disaster financing strategies generally have high opportunity costs for developing countries. When a disaster occurs, budget allocations are often diverted from priority development projects to fund emergency and recovery needs. In the face of the rising frequency and intensity of losses in low- and middle-income countries, the old model of post-disaster financing and reliance on the donor community is increasingly inefficient.

There is a need for a comprehensive disaster management financing strategy encompassing all regions and possible disasters at national level. A well-designed catastrophe risk financing program should enable a disaster-prone country to avoid any major financial disruptions following natural disasters by meeting in full its post-disaster funding needs without impacting long-term development objectives. The need for investments and funds for disaster management should be envisaged in light of the alternative plans to focus on different activities in the various phases of disaster management. There must be greater investment in disaster
reduction rather than high-profile response efforts. Following financial initiatives may be incorporated while making an integrated strategy:

1) Insurance Pool

Insured losses caused by natural catastrophes are trending upwards. As per Swiss Re’s sigma report on natural catastrophes and man-made disasters, March 2011 earthquake of Japan resulted in $35 billion in insured losses, which made it the most expensive earthquake on record. Earthquake that destroyed portions of Christchurch in New Zealand in February 2011 was the third most expensive earthquake, which resulted in insured losses of about $12 billion and floods in Thailand caused estimated $12 billion insured losses. Biloxi, Mississippi, where 35 percent of city operating revenue comes from taxes on the gaming industry, the city had purchased a business interruption insurance policy at the beginning of the 2005 hurricane season. This policy guaranteed $10 million in income if the gaming industry were shut down because of a disaster. The gaming industry had to shut down due to hurricane Katrina, but the payment from the business continuity insurance policy provided some financial relief for the city's recovery. However, it is very difficult for a single insurer to manage with the losses arising out of disaster.

A catastrophe risk pool is an arrangement by which the insurance companies come together to pool resources and minimise the risk of insuring against catastrophic events that may result in substantial claims for a single insurer. If a claim arises from a catastrophic event, the losses are spread among all members. This arrangement renders protection to individual members of the risk pool. Insurance pools usually cover residential risks against earthquakes and floods. GIC is managing the natural catastrophes pool, which will have participation from around 200 members from Asia and Africa. Global reinsurance firm Swiss Re had termed 2011 as the costliest year with insured natural catastrophic losses exceeding $110 billion and 60% of it arising from the Asia Pacific region. GIC posted a maiden loss of Rs 2,469 crore in 2011-12 due to unprecedented natural catastrophes in Thailand, Japan, New Zealand and Australia. Despite record losses and challenging financial environment of 2011 insurance industry played an important role in post-disaster recovery financing, bringing much needed funds to effected population, business and governments. The Turkish Catastrophe Insurance Pool offers efficiently priced earthquake
insurance to more than 2.5 million homeowners. The World Bank Group is also supporting the creation of a regional catastrophe reinsurance pool for South-East European countries.

Swiss Re believes natural disasters are insurable risks in the private market throughout most countries in the world - provided the free market is allowed to work. Free markets will create a more diversified insurance and reinsurance market that will spread risk widely, increasing capacity and price competition.

The terrorism risk cover in India is granted by The Terrorism Pool, which is managed by General Insurance Corporation (GIC). The dozen odd Indian general insurers led by GIC and guided by IRDA, the Indian insurance regulator, which were in agreement that it was virtually impossible to quantify the risk of terrorism, both in terms of severity and the frequency of exposure, a ‘terrorism insurance pool’ was the best remedy. To begin with in 2002, the pool provided a terrorism cover of Rs.1000 million (US $ 20 million). In 2012 the Pool grew to provide a capacity of Rs. 1000 crores.

2) Parametric Cover

Parametric insurance makes indemnity payments based not on an assessment of the policyholder’s individual loss, but rather on measures of a parametric index that is assumed to proxy actual losses. It occurs generally on triggering a natural catastrophic event. Unlike traditional insurance, parametric instruments use a model to calculate the payout of the insurance policy. This payout model aims to closely mirror the actual damage on the ground and enables a much more rapid payment as no loss adjusters are required after the event to assess the actual damage. The government can purchase parametric cover, from the insurance and/or capital markets. The amount is paid out immediately after a triggering event and can be used by the government to provide immediate relief to the affected population and/or to rebuild infrastructure. The Caribbean Catastrophe Risk Insurance Facility (CCRIF), for example, offers parametric insurance against major hurricanes and earthquakes in 16 Caribbean countries. Swiss Re is the big player in reinsuring natural catastrophes and the global leader in the provision of parametric covers and the securitisation of insurance risk. According to Swiss Re report, the parametric insurance coverage triggered by the earthquake in Haiti enabled the government to provide accelerated assistance to the survivors. The Haitian catastrophe has highlighted the potential of parametric insurance to help countries plan for and pre-finance natural disasters as part of a comprehensive disaster risk management strategy.
3) **Financial instruments**

Inclusion of financial instruments for management of disasters will reduce the burden on government's budget. Capital market instruments like Catastrophe Bonds (cat bonds) can provide capacity in excess of private insurance market capabilities, if necessary.

**Catastrophe Bonds:**

It is a high-yield debt instrument that is usually insurance linked and meant to raise money in case of a catastrophe such as a hurricane or earthquake. It has a special condition that states that if the issuer (insurance or reinsurance company) suffers a loss from a particular pre-defined catastrophe, then the issuer's obligation to pay interest and/or repay the principal is either deferred or completely forgiven. (Ref: INVESTOPEDIA) An insurance company issues bonds to financial investors, such as hedge and pension funds, that are willing to place a bet on the probability of a disaster occurring at a particular location and during a specific time frame. During the life of the bond, the insurer pays investors a coupon interest rate. If nothing happens, the insurer returns the money when the bond matures. However, if the catastrophic event occurs, cat bond investors have to forgo all or part of the principal.

Back in the early 1990s, in the aftermath of Hurricane Andrew, which devastated parts of Florida, and the Northridge quake in California, insurers started to issue cat bonds to spread risk to financial investors. Reinsurance companies such as Munich Re and Swiss Re were also active in this market. (Reinsurers traditionally have insured other insurers against big disasters.) At the end of 2010, there were $12.5 billion in cat bonds outstanding, according to Aon Benfield, the reinsurance broker of Chicago-based Aon. In Japan's case, much of the $1.7 billion worth of cat bonds focused on Japan were designed for quakes only in the Tokyo metropolitan area, the country's economic and financial market hub that accounts for about 40 percent of the nation's economy.

Advantages of CAT bonds are that they are not closely linked with the stock market or economic conditions and offer significant attractions to investors. For example, for the same level of risk, investors can usually obtain a higher yield with CAT bonds relative to alternative investments. Another benefit is that the insurance risk securitization of CATs shows no correlation with equities or corporate bonds, meaning they'd provide a good diversification of risks. (Ref: INVESTOPEDIA) Event-linked bonds are generally tied to a certain event and are
not 100% correlated to swings in the Dow Jones Industrial Average or S&P 500. This generally low correlation can be very attractive for investors looking to spread risk within their portfolios. Event-linked bonds are not for everyone, particularly those that are risk averse. However, those seeking potentially large returns in the form of an income stream and who are willing to accept risk may find these bonds to be an attractive investment that fits into their overall portfolio strategy. One way that the individual investor can invest in event-linked bonds without the hassle of having to search through mounds of ongoing research is to purchase shares in a mutual fund that maintains a position in event-linked or CAT bonds. Event-linked bonds, or catastrophe bonds, have become increasingly popular among reinsurance companies since their inception in the '90s, and with fears of global warming continuing to grow; they look to be a handy staple in the reinsurance market. Insurers and reinsurers have used the instruments since the 1990s to manage their exposure to hurricanes, earthquakes and other calamities, by transferring potential losses to investment funds. Insurance companies show no signs of abandoning the cat bonds, even though the market failed to deliver a big payout for the Japan disaster. Reinsurers may need to issue new securities to cover future losses in Japan. Insurers, sure to face higher premiums from their reinsurers, may do the same. Swiss Re, the world's second-biggest reinsurer, sold $95 million of zero-coupon catastrophe bonds on Mar. 30 through its Sector Re V unit containing loss triggers that include another earthquake in Japan. There is also strong demand from pension funds, which may push up issuance of cat bonds according to Axa Investment Managers.

Investors receive a high rate of interest but risk losing all or part of their principal if a catastrophe occurs.

Munich Re said it was considering launching a fund to allow investors to buy catastrophe bonds and other insurance linked securities (ILS) to build on the growing demand for the instruments that are linked to natural disasters.

Catastrophe bonds designed to provide capital to insurance companies when extreme, big-scale disasters occur. Yet it turns out the cat bond market won't be of much help in covering Japan-related insurance losses. Such bonds often have covenants that strictly limit the type and location of a disaster they will cover. Most cat bonds covered quake losses only in Tokyo.
The World Bank Group has developed a platform for a multi-country, multi-peril cat bond that transfers diversified risk to private investors.

4) Microfinance

In 2001 the IPCC concluded that the impact of climate change will fall disproportionately up on developing countries and the poor persons within all these countries. The poor are least able to cope on their own with the threats to their homes, communities, livelihoods and health. If climate change is indeed a threat to which poor are acutely vulnerable and if micro finance is in fact a tool that can reduce the vulnerability of the poor then the possibility of linking this tool to climate adaptation is of considerable importance (Anne Hammill et. Al. 2008). A growing number of microfinance institutions (MFIs), networks and funders have launched new products and partnerships aimed at micro-finance-environment connections. A number of MFIs and networks including ACCION, BASIX in INDIA and Equity Bank in Kenya are exploring products to respond to climate change challenges and opportunities.

Microfinance provides basic financial services to poor and low income households and their micro enterprises. Microfinance includes a number of financial tools such as savings, credit, leasing, insurance and cash transfers. These services are provided by various institutions such as banks, NGOs, credit and saving cooperatives associations and non-financial and informal sources. The important advantages of micro finance organisations are that they are flexible while offering credit, regionally bound and active at the grass root level of the population.

Role of Micro-Finance in Disaster Management
While the primary objective of the MFIs is to provide capital for microenterprise development with a focus on increase in the clients’ income and assets, a corresponding purpose of microfinance will be to help clients to shield their income and assets from the ill-effects of disasters.

**Role of Microfinance Institutions after the 2004 tsunami**

The devastating tsunami caused not only the loss of lives and housing but also impacted the sources of earning livelihood. The main livelihood assets such as boats, engines, nets, livestock etc. washed away and business assets such as shops, stalls, machines etc. were also ruined. There was a loss to the agriculture with agricultural land getting flooded with saline water. Deaths of livestock were caused due to drinking of this water. Loss of lives and injury were predominantly common among women and children, however majority of the insured people were men. Loss of assets and lives affected the financial capital. Agricultural and fishing markets stayed depressed. The affected population found it difficult to respond effectively due to...
already prevalent poverty. They were mainly looking out for replacement of assets, provision of seeds and other working capital requirements. Apart from Government, NGOs, and local money lenders, there was a great support given by Micro Finance Institutes such as Alternatives for Social Action (ASA), Covenant Center for Development (CCD), Indian Association for Savings and Credit (IASC) and Evangelical Social Action Forum (ESAF) among others.

**Areas of intervention of Microfinance Institutions in Tamil Nadu after tsunami of 2004**

(Source: Intellectual Capital Private Limited, Post tsunami role of MFIs in India-The Indian Reality Presentation to Grameen Foundation by Intellectual Capital Private Limited-India [http://www.grameenfoundation.org/sites/default/files/Post-tsunami_Role_of_MFIs_in_India.pdf](http://www.grameenfoundation.org/sites/default/files/Post-tsunami_Role_of_MFIs_in_India.pdf))

Figure 9.3
Areas of intervention of Microfinance Institutions in Kerala after tsunami of 2004

The intervention areas of Microfinance Institutions have been marked with blue coloured circles.
(Source: Intellectual Capital Private Limited, Post tsunami role of MFIs in India The Indian Reality Presentation to Grameen Foundation by Intellectual Capital Private Limited-India http://www.grameenfoundation.org/sites/default/files/Post-tsunami_Role_of_MFIs_in_India.pdf)

The inbuilt flexibility of microfinance products enables it to serve a wide range of rehabilitation needs in post disaster scenario and thus helps in bringing the lives to normalcy faster. Microfinance instruments help poor families to diversify their earnings. They also provide opportunities to women to get opportunities to earn livelihood and empowerment. Multiple opportunities for earning and asset building through microfinance help poor households in responding disasters in a better and confident manner. In the aftermath of large-scale disasters, microfinance institutions offer a number of services such as provision of temporary loans for housing and for starting new activities, loan rescheduling, and assistance in asset replacements as
a part of recovery and reconstruction phase which helps clients in coping with the ill-effects of natural disasters.

The role of microfinance services in responding to disaster risks was demonstrated first during the 1998 flood, and thereafter during other floods and disasters, viz. floods of 2004, 2007, and storm surge SIDR 2007.

5) Other Financial Initiatives

a) Development Policy Loan (DPL) with Catastrophe Deferred Drawdown Option (CAT DDO) to provide immediate liquidity up to USD500 million or 0.25% of GDP (whichever is less) to IBRD-member countries in the event of a natural disaster.

b) Weather Derivatives can help protect countries against the risk of adverse weather events. The first such initiative, designed to help Malawi protect itself against the risk of severe drought, is an option on a rainfall index linking rainfall with national maize production.

c) The National Agricultural Insurance Scheme (covering more than 20 million farmers) and the Weather Based Crop Insurance Scheme (covering more than 7,00,000 farmers) in India protect against poor harvests caused by drought or frost. Similar initiatives are ongoing in Malawi, Thailand, and Central America.

9.7 Scope for Further Research

Disaster Management studies are perpetual studies with new emerging dimensions in view of the changes in economic, social, cultural, political, commercial and other overall changes in the world. The future studies need to look into different parameters in different geographical regions and in different time periods in this ever changing world. Comparison and study of monetary outlay and resources requirement towards preparedness/preventive measures and that towards the reconstruction/rehabilitation activities is a need of an hour. Vulnerability analysis on the basis of above can help determine the investment requirements in tools / equipments / technology for prediction of disasters. The usage of information systems and technology has a huge scope in order to minimize the losses and wastages arising out of disasters. The information database of organizations/ volunteers engaged in disasters
management and that of various authorities such as fire brigade, police, hospitals etc. can go a long way to ensure effective preparedness.

As regards manmade disasters such as terrorism are concerned, considering the risk of money laundering, the involvement of terrorists and antisocial elements in capital markets has become a grave challenge for the economy. This also obstructs the flow of investments in the country. Research needs to be conducted to study and unearth such linkages and suggest possible measures in terms of mass awareness, skill development and technological innovations to combat the threats of such disasters.

The current studies discuss various aspects of disaster management with a focus on financial implications. The studies broadly look into various general and financial impacts of the disasters. Each of these impacts needs to be studied in details in order to gain a comprehensive and in depth understanding of financial implications of these impacts. It is important to assess and categorically evaluate the direct as well as indirect impacts of the disasters in a standardised and methodical manner to understand the financial implications caused by them. Money has time value. The direct as well as secondary losses and damages caused due to disasters in the current period need to be compared with the reimbursements and settlements in the future years. The emerging role of reinsures needs to be strengthened and regulated by Government. The possibility of cyber terrorism also needs to be dealt with. This work needs to be done for specific time intervals in order to understand the real costs of disasters. A lot of work needs to be done in this area.

9.8 Conclusion:

Disasters are showing a rising trend in recent year resulting in financial losses. Enabling policy framework is needed at the national level to promote further investments and research for disaster management projects. New hybrid organizations involving corporate sector, government, civil society and NGOs are coming up. Proactive policy interventions of national governments shall encourage such innovations on disaster risk reduction with minimal direct investments of government. Focus on the most vulnerable people and areas needs to be the approach for responding to disasters as well as reducing disaster risks. Updated information should be maintained to support this. Consolidation of institutional learning processes and creation of a
public domain knowledge bank as well as educational programmes will support long term improvements in capacities.

The development of a holistic and proactive approach is undermined by duplication of disaster management activities, circuitous initiatives by multiple stakeholders and wastage. For this, the prevailing post-disaster reaction needs to be transformed into a pre-disaster pro-action.

A comprehensive disaster management strategy, involving aspects such as Comprehensive legal and constitutional framework, Accuracy and Standardisation in Data Collection and Analysis, Effective Assessment & Documentation of Disaster events, Continuous Initiatives for Research & Studies, Proactive measures for Infrastructure Development, Regional Aspects, Capacity building at individual, societal and Corporate Level, Population Vulnerability aspects, Financial initiatives can be very effective in minimising the ill effects of disasters if applied in totality.