

Disaster management in India: An assessment

■ A.L. HAMSA AND ABDUL JAMAL

Asian Journal of Environmental Science | December, 2011 | Vol. 6 Issue 2 : 203 -209

Received:

September, 2011

Accepted :

November, 2011

SUMMARY

Disasters are events that disrupt the normal functioning of the economy and society on a large scale. Natural, technological, and willful sources of disasters all cause drastic losses of life and property. A variety of terms are used in the fields of emergency and disaster management. Over time, a fairly standard set of definitions has emerged, as reflected in a series of reports from the National Research Council and other groups. Emergencies, disasters, and catastrophes, for example, are distinct events with important differentiating characteristics. This report does not specifically consider “emergencies”—a term that connotes “everyday” events that can be handled within the normal operational limits of public safety agencies—nor does it distinguish between disasters and larger-scale events that might be called catastrophes, even though it is likely that the value of IT capabilities increases as the complexity and scale of communication problems become greater. Throughout this report, the term “disaster” can be read as “disaster and catastrophe.” Disaster management occupies an important place in this country’s policy framework as it is the poor and the under-privileged who are worst affected on account of calamities/disasters. One of the essential characteristics of disasters is their complexity. Although disasters may have relatively discrete origins, their effects propagate and interact in ways that intensify the complexities and uncertainties of dealing with them effectively. One major result is that disasters must be responded to in an environment that can be overwhelming, unfamiliar, and disorienting. Therefore, this paper makes an attempt to assess the Disaster management system in India.

How to cite this paper: Hamsa, A. L. and Jamal, Abdul (2011). Disaster management in India: An assessment. *Asian J. Environ. Sci.*, 6(2): 203-209.

Key Words :

Flood,
Earthquake,
Disaster and
catastrophe

Disasters are events that disrupt the normal functioning of the economy and society on a large scale. Natural, technological, and willful sources of disasters all cause drastic losses of life and property. A variety of terms are used in the fields of emergency and disaster management. Over time, a fairly standard set of definitions has emerged, as reflected in a series of reports from the National Research Council and other groups. Emergencies, disasters, and catastrophes, for example, are distinct events with important differentiating characteristics. This report does not specifically consider “emergencies”—a term that connotes “everyday” events that can be handled within the normal operational limits of public safety agencies—nor does it distinguish between disasters and larger-scale events that might be called catastrophes, even though it is likely that the value of IT capabilities increases as the complexity and scale of communication

problems become greater. Throughout this report, the term “disaster” can be read as “disaster and catastrophe.”

Disaster management occupies an important place in this country’s policy framework as it is the poor and the under-privileged who are worst affected on account of calamities/disasters. One of the essential characteristics of disasters is their complexity. Although disasters may have relatively discrete origins, their effects propagate and interact in ways that intensify the complexities and uncertainties of dealing with them effectively. One major result is that disasters must be responded to in an environment that can be overwhelming, unfamiliar, and disorienting. These challenges are quite familiar to experienced emergency managers and first responders, as manifest in a homespun sign found in many U.S. emergency operations centers (Fig. 1). This sign stands in marked

Author for
Correspondence -

A. L. HAMSA
Department of
Economics, The New
College, CHENNAI
(T. N.) INDIA

See end of the paper
for Coopted authors

contrast to a sign described by a reviewer of this report in draft form that lists what emergency managers aspire to—and often achieve despite the many obstacles—in a disaster (Fig. 2).

Fig. 1 : The emergency operations centre

Where uncomfortable officials
Meet in unfamiliar surroundings
To play unaccustomed roles
Making unpopular decisions
Based on inadequate information
and in much too little time

Fig. 2 : Standign orders for all disasters

1. Establish / re-establish communication with affected area.
2. Secure and complete search and rescue.
3. Meet basic human needs for medical treatment, water, food, shelter and emergency fuels; ice is a distant fifth (unless it's really hot).
4. Restore critical infrastructure.
5. Open schools and local businesses.
6. Begin the recovery.

Disaster management is a multifaceted process aimed at minimizing the social and physical impact of these large-scale events. The difficult nature of disaster management is well illustrated by the Catastrophic Incident Annex to the National Response Plan, which lists some of the potential problems faced in the aftermath of a disaster.

The changed approach is being put into effect through:

Institutional changes, Enunciation of policy, Legal and techno-legal framework, Mainstreaming Mitigation into Development process, Funding mechanism, Specific schemes addressing mitigation, Preparedness measures, Capacity building, Human Resource Development and, above all, Community participation

Institutional and policy framework:

The institutional and policy mechanisms for carrying out response, relief and rehabilitation have been well-established since Independence. These mechanisms have proved to be robust and effective insofar as response, relief and rehabilitation are concerned. The changed policy/approach, however, mandates a priority to pre-disaster aspects of mitigation, prevention and preparedness and new institutional mechanisms are being

put in place to address the policy change. Mitigation, preparedness and response are multi-disciplinary functions, involving a number of Ministries/Departments. Institutional mechanisms which would facilitate this inter-disciplinary approach are being put in place. It is proposed to create Disaster Management Authorities, both at the National and State levels, with representatives from the relevant Ministries/Departments to bring about this coordinated and multi-disciplinary with experts covering a large number of branches. The National Emergency Management Authority is proposed to be constituted. The organization will be multi-disciplinary with experts covering a large number of branches. The National Emergency Management Authority is proposed as a combined Secretariat/Directorate structure – a structure which will be an integral part of the Government while, at the same time, retaining the flexibility of a filed organization.

The authority will be headed by an officer of the rank of Secretary/ Special Secretary to the Government in the Ministry of Home Affairs with representatives from the Ministries/Departments of Health, Water Resources, Environment and Forest, Agriculture, Railways, Atomic Energy, Defence, Chemicals, Science and Technology, Telecommunication, Urban Employment and Poverty alleviation, Rural Development and Indian Meteorological Department as Members. The authority would meet as often as required and review the status of warning systems, mitigation measure and disaster preparedness. When a disaster strikes, the authority will coordinate disaster management activities.

The authority will be responsible for :

- Providing necessary support and assistance to State Governments by way of resource data, macro management of emergency response, specialized emergency response teams, sharing of disaster related data base etc.
- Coordinating/mandating Government's policies for disaster reduction/mitigation
- Ensuring adequate preparedness at all levels
- Coordinating response to a disaster when it strikes
- Assisting the Provincial Government in coordinating post disaster relief and rehabilitation
- Coordinating resources of all National Government Department/agencies involved.
- Monitor and introduce a culture of building requisite features of disaster mitigation in all development plans and programmes.
- Any other issues of work, which may be entrusted to it by the Government.

Re-structuring of the relief department in the states:

At the state level, the work of post calamity relief was being handled by the departments of relief and rehabilitation. The Government of India is working with the State Governments to restructure the Departments of Relief and Rehabilitation into Departments of Disaster Management with an enhanced area of responsibility to include mitigation and preparedness apart from their present responsibilities of relief and rehabilitation. The changeover has already happened in 11 States/UTs - Andhra Pradesh, Arunachal Pradesh, Bihar, Himachal Pradesh, Rajasthan, Tamil Nadu, Uttaranchal, Nagaland, Andaman and Nicobar Administration, Sikkim and Lakshadweep. The change is under process in other States.

The States have been advised to restructure/re-group the officers/staff within the Department of Disaster Management with definite functions to pursue the holistic approach to disaster management. The four functional groups to be assigned with specific tasks within the departments are as indicted below:-

Functional Group 1: Hazard Mitigation

Functional Group 2: Preparedness and Capacity Building

Functional Group 3: Relief and Response

Functional Group 4: Administration and Finance

Disaster prevention and mitigation:

The Yokohama message emanating from the international decade for natural disaster reduction in May, 1994 underlined the need for an emphatic shift in the strategy for disaster mitigation. It was inter alia stressed that disaster prevention, mitigation, preparedness and relief are four elements which contribute to and gain, from the implementation of the sustainable development policies. These elements alongwith environmental protection and sustainable development, are closely inter related, and it was therefore, recommended that Nations should incorporate them in their development plans and ensure efficient follow up measures at the community, sub-regional, regional, national and international levels. The Yokohama Strategy also emphasized that disaster prevention, mitigation and preparedness are better than disaster response in achieving the goals and objectives of vulnerability reduction. Disaster response alone is not sufficient as it yields only temporary results at a very high cost. Prevention and mitigation contribute to lasting improvement in safety and are essential to integrated disaster management.

Mainstreaming disaster management into development :

The Government of India have adopted mitigation

and prevention as essential components of their development strategy. The Tenth Five Year Plan document has a detailed chapter on Disaster Management. The plan emphasizes the fact that development cannot be sustainable without mitigation being built into developmental process. Each State is supposed to prepare a plan scheme for disaster mitigation in accordance with the approach outlined in the plan. In brief, mitigation is being mainstreamed into developmental planning.

Financial arrangement:

The Finance Commission makes recommendations with regard to devolution of funds between the Central Government and State Governments as also outlays for relief and rehabilitation. The earlier Finance Commissions were mandated to look at relief and rehabilitation. The Terms of Reference of the Twelfth Finance Commission have been changed and the Finance Commission has been mandated to look at the requirements for mitigation and prevention apart from its existing mandate of looking at relief and rehabilitation. A Memorandum has been submitted to the Twelfth Finance Commission after consultation with States. The Memorandum proposes the creating of a disaster mitigation fund, which will assist the States in taking mitigation measures like retrofitting of lifeline buildings, coastal shelterbelt plantation etc.

Flood preparedness and response:

In order to respond effectively to floods, Ministry of Home Affairs have initiated National Disaster Risk Management Programme in all the flood-prone States. Assistance is being provided to the States to draw up disaster management plans at the State, District, Block/Taluka and Village levels. Awareness generation campaigns to sensitize all the stakeholders on the need for flood preparedness and mitigation measures. Elected representatives and officials are being trained in flood disaster management under the programme. Bihar, Orissa, West Bengal, Assam and Uttar Pradesh are among the 17 multi-hazard prone States where this programme is being implemented with assistance from UNDP, USAID and European Commission.

Earthquake risk mitigation:

A comprehensive programme has been taken up for earthquake risk mitigation. Although, the BIS has laid down the standards for construction in the seismic zones, these were not being followed. The building construction in urban and suburban areas is regulated by the Town and Country Planning Acts and Building Regulations. In

many cases, the building regulations do not incorporate the BIS codes. Even where they do, the lack of knowledge regarding seismically safe construction among the architects and engineers as well as lack of awareness regarding their vulnerability among the population led to most of the construction in the urban/sub-urban areas being without reference to BIS standards. In the rural areas, the bulk of the housing is non-engineered construction. The mode of construction in the rural areas has also changed from mud and thatch to brick and concrete construction thereby increasing the vulnerability. The increasing population has led to settlements in vulnerable areas close to the river bed areas which are prone to liquefaction. The Government have moved to address these issues.

National core group for earthquake risk mitigation:

A national core group for earthquake risk mitigation has been constituted consisting of experts in earthquake engineering and administrators. The core group has been assigned with the responsibility of drawing up a strategy and plan of action for mitigating the impact of earthquakes; providing advice and guidance to the States on various aspects of earthquake mitigation; developing/organizing the preparation of handbooks/pamphlets/type designs for earthquake resistant construction; working out systems for assisting the states in the seismically vulnerable zones to adopt/integrate appropriate Bureau of Indian Standards codes in their building byelaws; evolving systems for training of municipal

Review of building bye-laws and their adoption:

Most casualties during earthquakes are caused by the collapse of structures. Therefore structural mitigation measures are the key to make a significant impact towards earthquake safety in our country. In view of this the States in earthquake prone zones have been requested to review, and if necessary, amend their building bye-laws to incorporate the BIS seismic codes for construction in the concerned zones. Many States have initiated necessary action in this regard. An Expert Committee appointed by the Core Group on Earthquake Risk Mitigation has already submitted its report covering appropriate amendments to the existing Town and Country Planning Acts, Land Use Zoning Regulation, Development Control Regulations and Building Bylaws, which could be used by the State Governments and the local bodies there-under to upgrade the existing legal instruments. The Model Building Bylaws also cover the aspect of ensuring technical implementation of the safety aspects in all new constructions and upgrading the strength

of existing structurally vulnerable constructions. To facilitate the review of existing building byelaws and adoption of the proposed amendments by the State Governments and UT administrations, discussion workshops at regional level in the country are being organized.

Development and revision of codes:

There are Bureau of Indian Standard (BIS) codes which are relevant for multi-hazard resistant design and construction. Some of the codes need to be updated. There are some areas for which codes do not exist. An action plan has been drawn up for revision of existing codes, development of new codes and documents/commentaries, and making these codes and documents available all over the country including on-line access to these codes. An Apex committee consisting of representatives of Ministry of Consumer Affairs, BIS and MHA has been constituted to review the mechanism and process of development of codes relevant to earthquake risk mitigation and establish a protocol for revision by BIS.

Hazard safety cells in states:

The States have been advised to constitute Hazard Safety Cells (HSC) headed by the Chief Engineer, State PWD with necessary engineering staff so as to establish mechanism for proper implementation of the building codes in all future Govt. constructions, and to ensure the safety of buildings and structures from various hazards. The HSCs will also be responsible for carrying out appropriate design review of all Government buildings to be constructed in the State, act as an advisory cell to the State Government on the different aspects of building safety against hazards and act as a consultant to the State Government for retrofitting of the lifeline buildings. Rajasthan, West Bengal, Delhi and Chhatisgarh have already constituted these cells and other states are in the process.

National programme for capacity building of engineers and architects in earthquake risk mitigation:

Two National Programmes for Capacity Building in Earthquake Risk Mitigation for Engineers and Architects, respectively, have been approved to assist the State Government in building up capacities for earthquake mitigation. Under these two programmes 10,000 engineers and 10,000 architects in the States will be given training in seismically safe building designs and related technological requirements. Assistance is being provided to the State/UTs to build the capacities of more than 125 State Engineering Colleges and 110 Architecture Colleges to

be able to provide advisory services to the State Govts to put in place appropriate techno-legal regime, assessment of building and infrastructures and their retrofitting. These institutions will function as State Resource Institutions. Twenty-one Engineering and Architecture Institutions have been designated as National Resource Institutes to train the faculty members of selected State Engineering and Architecture colleges. 450 engineering faculty members and 250 architecture faculty members of these State Resource Institutions will be trained during the current year.

Training of rural masons:

A programme to assist the States/UTs in training and certification of 50000 masons has been formulated in consultation with Housing and Urban Development Corporation (HUDCO) and the Ministry of Rural Development. The training module for masons to include multi-hazard resistant construction has also been prepared by an expert committee, and revised curriculum will be introduced in the vocational training programme of Ministry of Human Resource Development.

Earthquake engineering in undergraduate engineering/architecture curricula:

The role of engineers and architects is crucial in reducing earthquake risks by ensuring that the construction adhere to the norms of seismic safety. In view of this, the elements of earthquake engineering is being integrated into the undergraduate engineering and architecture courses. Model course curricula have been developed for adoption by various technical institutions and universities. And circulated to the Universities and Technical Institutions for integration into the undergraduate curriculum. Ministry of Home Affairs is working with All India Council of Technical Education (AICTE) and Council of Architecture (COA) for introduction of revised curricula for engineering and architecture course.

Retrofitting of lifeline buildings:

While these mitigation measures will take care of the new constructions, the problem of unsafe existing building stock would still remain. It will not be possible to address the entire existing building stock, therefore the life line buildings like hospitals, schools or buildings where people congregate like cinema halls, multi-storied apartments are being focussed on. The States have been advised to have these buildings assessed and where necessary retrofitted. The Ministries of Civil Aviation, Railways, Telecommunication, Power and Health and Family Welfare have been advised to take necessary

action for detailed evaluation and retrofitting of lifeline buildings located in seismically vulnerable zones so as to ensure that they comply with BIS norms, Action plan have been drawn up by these Ministries for detailed vulnerability analysis and retrofitting/ strengthening of buildings and structures.

National earthquake risk mitigation project:

An Earthquake Mitigation Project has been drawn up, with an estimated cost of Rs.1132 crore. The project has been given in-principle clearance by the Planning Commission. The programme includes detailed evaluation and retrofitting of lifeline buildings such as hospitals, schools, water and power supply units, telecommunication buildings, airports/airport control towers, railway stations, bus stands and important administrative buildings in the States/UTs in seismic zones IV and V. The programme also includes training of masons in earthquake resistant constructions, as well as, assistance to the State Governments to put in place an appropriate techno legal regime.

Accelerated urban earthquake vulnerability reduction programme:

An accelerated urban earthquake vulnerability reduction programme has been taken up in 38 cities in seismic zones III, IV and V with population of half a million and above. These cities are Dehradun, Delhi, Jamnagar, Rajkot, Bhavnagar, Surat, Greater Mumbai, Bhiwandi, Nasik, Pune, Bhubaneswar, Cuttack, Chennai, Patna, Asansol, Guwahati, Vadodara, Coimbatore, Ahmedabad, Agra, Varanasi, Bareilly, Meerut, Lucknow, Kanpur, Kolkatta, Srinagar, Jammu, Indore, Jabalpur, Amritsar, Jalandhar, Vijayawada, Dhanbad, Mangalore, Kochi, Kozhikode and Trivandrum. 474 Orientation programmes have been organized for senior officers and representatives of the local planning and development bodies to sensitize them on earthquake preparedness and mitigation measures. Training programmes have been organized for engineers and architects to impart knowledge about seismically safe construction and implementation of BIS norms.

Core group on cyclone mitigation:

A National Core Group on Cyclone Monitoring and Mitigation has been constituted. Experts from Indian Meteorological Department, National Centre for Medium Range Weather Forecasting, Central Water Commission, National Remote Sensing Agency and Indian Space Research Organisation have been made the Members of the Core Group, besides administrators from the relevant Ministries/Departments and State Governments

vulnerable to cyclones. The group has been assigned the responsibility of looking at warning protocols for cyclones; coordination mechanism between different Central and State Ministries/Departments/Organisations; mechanism for dissemination of warning to the local people and cyclone mitigation measures required to be taken for the coastal States. The group will also suggest short-term and long-term measures on technology up-gradation.

National cyclone mitigation project:

A project for cyclone mitigation (estimated cost Rs.1050 crore) has been drawn up in consultation with the cyclone prone States. This project envisages construction of cyclone shelters, coastal shelter belt plantation in areas which are prone to storm surges, strengthening of warning systems, training and education etc. This project has also been given in principle clearance by the Planning Commission and is being taken up with World Bank assistance.

Landslide hazard mitigation:

A National Core Group has been constituted under the Chairmanship of Secretary, Border Management and comprising of Secretary, Department of Science and Technology, Secretary, Road Transport & Highways, and the Heads of Geological Survey of India and National Remote Sensing Agency for drawing up a strategy and plan of action for mitigating the impact of landslides, provide advise and guidance to the State Governments on various aspects of landslide mitigation, monitor the activities relating to landslide mitigation including landslide hazard zonation and to evolve early warning systems and protocols for landslides/landslide risk reduction.

Disaster risk management programme:

A disaster risk management programme has been taken up in 169 districts in 17 multi-hazard prone States with the assistance from UNDP, USAID and European Union. These States are Assam, Arunachal Pradesh, Bihar, Delhi, Gujarat, Maharashtra, Meghalaya, Mizoram, Manipur, Nagaland, Orissa, Sikkim, Tamil Nadu, Tripura, Uttar Pradesh, Uttaranchal and West Bengal, Under this project, the States are being assisted to draw up State, district and Block level disaster management plans; village disaster management plans are being developed in conjunction with the Panchayati Raj Institutions and disaster management teams consisting of village volunteers are being trained in preparedness and response functions such as search and rescue, first aid, relief coordination, shelter management etc. States

and district level multi-hazard resistant emergency operation centres (EOCs) are also being set up under the programme. Equipment needs for district and state emergency operation centres have been identified by the State nodal agencies and equipments are being provided to equip these EOCs. Orientation training of masons, engineers and architects in disaster resistant technologies have been initiated in these districts and construction of model demonstration buildings will be started soon.

Information, education and communication:

In order to assist the State Governments in capacity building and awareness generation activities and to learn from past experiences including sharing of best practices, the Ministry of Home Affairs has compiled/prepared a set of resource materials developed by various organisations/institutions to be replicated and disseminated by State Government based on their vulnerabilities after translating it into the local languages. The voluminous material which runs into about 10000 pages has been divided into 4 broad sections in 7 volumes. These sections cover planning to cope with disasters; education and training; construction toolkit; and information, education and communication toolkit including multi-media resources on disaster mitigation and preparedness. The Planning section contains material for analyzing a community's risk, development of Preparedness. Mitigation and disaster management plans, coordinating available resources and implementing measures for risk reduction.

Model bye-laws, DM Policy, Act and model health sector plan have also been included. Education and training includes material for capacity building and upgradation of skills of policy makers, administrators, trainers, engineers etc. In planning for and mitigating against natural disasters. Basic and detailed training modules in disaster preparedness have been incorporated along with training methodologies for trainers, for community preparedness and manuals for training at district, block, panchayat and village levels.

Conclusion and implications:

Disaster management requires multi-disciplinary and pro-active approach. Besides various measures for putting in place institutional and policy framework, disaster prevention, mitigation and preparedness enunciated in this paper and initiatives being taken by the central and state Governments, the community, civil society organizations and media also have a key role to play in achieving our goal of moving together, towards a safer India. The

message being put across is that, in order to move towards safer and sustainable national development, development projects should be sensitive towards disaster mitigation. Our mission is vulnerability reduction to all types of hazards, be it natural or manmade. This is not an easy task to achieve, keeping in view the vast population, and the multiple natural hazards to which this country is exposed. However, if we are firm in our conviction and resolve that the Government and the people of this country are not prepared to pay the price in terms of massive casualties and economic losses, the task, though difficult, is achievable and we shall achieve it.

We have taken the first few but significant steps towards vulnerability reduction, putting in place prevention and mitigation measures and preparedness for a rapid and professional response. With a massive awareness generation campaign and building up of capabilities as well as institutionalization of the entire mechanism through a techno legal and techno financial framework, we are gradually moving in the direction of sustainable development. The various prevention, mitigation measures outlined above are aimed at building up the capabilities of the communities, voluntary organisations and Government functionaries at all levels. Particular stress is being laid on ensuring that these measures are institutionalized considering the vast population and the geographical area of the country. This is a major task being undertaken by the Government to put in place mitigation measures for vulnerability reduction. This is just a beginning. The ultimate goal is to make prevention and mitigation a part of normal day-to-day life.. We have a firm conviction that with these measures in place, we could say with confidence that disasters like Orissa cyclone and Bhuj earthquake will not be allowed to recur in this country; at least not at the cost, which the country has paid in these two disasters in terms of human lives, livestock, loss of property and means of livelihood. Our vision 2020 is to build a safer and secure India through sustained collective effort, synergy of national capacities and people's participation. What looks a dream today will be transformed into reality in the next two decades. This is our goal and we shall strive to achieve this goal with a missionary zeal. The path ahead, which looks difficult today, will become a lot easier as we move along together.

COOPTED AUTHORS-

ABDUL JAMAL, Department of Economics, The New College, CHENNAI (T.N.) INDIA

REFERENCES

- Citizens Platform for Tsunami Affected (2005). Email to officer on special duty, relief and rehabilitation, in-charge of NGO and donor coordination, from citizens platform for Tsunami Affected – Tamil Nadu, January 10.
- David Naguib Pellow and Lisa Sun-Hee Park (2002). *The Silicon Valley of Dreams, Environmental Injustice, Immigrant Workers, and the High-Tech Global Economy*, New York University Press, New York & London.
- E.L. Quarantelli** (2000) "Emergencies, Disasters and Catastrophes Are Different Phenomena," Disaster Research Center, University of Delaware.
- Gupta, Alok** (2000). Vulnerability and disaster management in India. *Prehosp Disast Med.*, **15**(3): 98.
- Gupta, Kailash** (2009). *Disaster management and India: Responding Internally and Simultaneously in Neighboring Countries*.
- Kapur Anu**, Neeti, Meeta, Deeptima, Roshani, and Debanjali (2005). *Disasters in India: Studies of Grim Reality*. Jaipur, India: Rawat Publications.
- McEntire**, David, A. (2005). Revisiting the definition of "Hazard" and the importance of reducing vulnerability. Editorial. *J. Emergency Manag.* **3**(4) 1-3.
- National Disaster Management Authority (2009). Policy and guidelines. New Delhi: National Disaster Management Authority, Government of India. Accessed at <http://ndma.gov.in> on April 27.
- National Disaster Management Authority (2008). National Disaster Management Guidelines: Management of Floods. New Delhi: National Disaster Management Authority, Government of India, 89-90pp.
- National Institute of Disaster Management (2009). Various Hazards. New Delhi: National Institute of Disaster Management. Accessed at <http://nidm.gov.in/>.

