National Perspective on Disaster Management*

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Introduction

Globally, in the last 20 years there has been a rising trend especially in the Hydro-met disasters, with 92 per cent deaths occurring in under-developed countries. Asian Region remains epicentre of global disasters with 45 per cent of global disasters, 42 per cent of economic losses, 83 per cent of mortalities and 86 per cent of people getting affected. With 80 per cent of global disasters being weather related, impact of climate change is very significant. Fast economic growth, high population growth, rapid urbanisation (largely unplanned) and the fact that over one billion people in Asia survive on less than US \$1.25 per day; poverty drives vulnerability to disasters.

With 10 per cent of global disasters occurring in India, it is one of the five worst affected countries in the world in terms of number of deaths and people affected. India's vulnerability to various types of disasters remains high, with 58.6 per cent landmass prone to earthquakes, 12 per cent landmass (40 million hectares) prone to floods, 75 per cent of coastline getting affected by cyclones and tsunami, 68 per cent of cultivable area prone to drought and 15 per cent of land area at risk from landslides. Thus it emerges that, 85 per cent of India's land mass or 22 out of 29 States get affected by one or more types of disasters. Estimated average annual loss of approximately 2 per cent of GDP, forecast of increase in urban population from 377 million to 600 million by 2030 (40 per cent of population) and effects of climate change pose many challenges impinging on development.

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Since India has a progressive and forward looking development agenda of inclusive growth which is getting impacted by disasters, Disaster Risk Reduction (DRR) has emerged as a high priority focus area in our national policy framework.

National Disaster Management Institutional Mechanism

The overall coordination of Disaster Management (DM) vests with the Ministry of Home Affairs. The Cabinet Committee on Security (CCS) and National Crisis Management Committee (NCMC) are the key committees involved in the top-level decision making with regard to DM. The National Disaster Management Authority (NDMA) is the lead agency responsible for the preparation of DM plans and execution of DM functions at the national level. The National Disaster Management Institutional Mechanism is shown in a diagrammatic form at **Figure 1**.



Figure 1

Role of NDMA

NDMA functions under the Prime Minister, who is the Chairperson and currently four members have been nominated. Vital role of NDMA encompasses :-

- (a) Lay down policies, plans and guidelines for DM.
- (b) Coordinate their enforcement and implementation.

(c) Approve the National Disaster Management Plan (NDMP) and the DM Plans of all ministries and departments of the Government of India.

(d) Lay down guidelines for DM to be followed by all the central ministries, departments and the State governments.

The general superintendence, direction and control of the National Disaster Response Force (NDRF) is vested in and exercised by the NDMA. The National Institute of Disaster Management (NIDM) works within the framework of broad policies and guidelines laid down by the NDMA. The NDMA has the mandate to deal with all types of disasters – natural or humaninduced. However, other emergencies such as acts of terrorism, law and order, hijacking, air accidents, chemical, biological, radiological, nuclear (CBRN) attacks, mine disasters, port and harbour emergencies, forest fires, oilfield fires and oil spills are handled by NCMC. Nodal ministries notified for specific disasters are tabulated at **Figure 2**.

State-level DM Mechanism

As per the DM Act 2005, each State is mandated to constitute State Disaster Management Authority (SDMA) under the chairmanship of the Chief Minister. SDMA charter of responsibility is akin to that of NDMA. Likewise, as per the DM Act, the State Government is responsible to establish District Disaster Management Authority (DDMA) under District Collector / Deputy Commissioner / District Magistrate with the elected representative of the local authority as Co-chairperson.

NDMA and its Vision

In the backdrop of earthquake in Bhuj in 2001 and tsunami in 2004, the Government of India took a path-breaking decision by

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Disaster	Nodal Ministry/ Dept./ Agency	
Biological Disasters	Min. of Health and Family Welfare	(MoHFW)
Chemical Disasters and Industrial	Min. of Environment, Forests and	(MoEFCC)
Accidents	Climate Change	
Civil Aviation Accidents	Min. of Civil Aviation	(MoCA)
Cyclone, Tornado, and Tsunami	Min. of Home Affairs	(MHA)
Disasters in Mines	Min. of Coal; Min. of Mines	(MoC,
		MoM)
Drought, Hailstorm, Cold Wave and	Min. of Agriculture and Farmers	(MoAFW)
Frost, Pest Attack	Welfare	
Earthquake	Min. of Home Affairs	(MHA)
Flood	Min. of Home Affairs	(MHA)
Forest Fire	Min. of Environment, Forests and	(MoEFCC)
	Climate Change	
Landslides and Avalanche	Min. of Home Affairs	(MHA)
Nuclear and Radiological Emergencies	Dept. of Atomic Energy, Min. of Home	(DAE,MHA)
	Affairs	
Oil Spills	Min. of Defence/Indian Coast Guard	(MoD/ICG)
Rail Accidents	Min. of Railways	(MoR)
Road Accidents	Min. of Road Transport and Highways	(MoRTH)
Urban Floods	Min. of Urban Development	(MoUD)

NODAL MINISTRIES

Figure 2

enacting the Disaster Management Act, 2005 and constituted the NDMA to fulfil the long felt need for an institutional mechanism at the national level and to bring about the paradigm shift from a response and relief centric approach to a pro-active prevention, mitigation and preparedness driven approach, for preserving development gains and minimising loss of life, livelihood and property.

The vision enshrined in the National Policy on Disaster Management is to build a safer and disaster resilient India by a holistic, pro-active, technology driven and sustainable development strategy that involves all stakeholders and fosters a culture of prevention, preparedness and mitigation.

Milestones Achieved

In the last decade, the NDMA has worked towards laying a strong foundation and strengthening the DM mechanism framework at the national and state levels. Some of the significant milestones include :--

(a) Preparation of over 20 guidelines for various types of disasters.

(b) Undertaking several Studies and preparation of reports on certain vital disaster related issues.

(c) Supporting preparation of DM plans by states and departments.

(d) Raising, training and equipping of NDRF / SDRF.

(e) Preparation of National Disaster Management Policy (2009).

(f) Risk reduction and mitigation projects – cyclone and school safety.

(g) Awareness programmes and conduct of mock exercises.

National Disaster Management Plan

The first NDMP prepared by NDMA was released by the Prime Minister on 01 June 2016. The Plan hinges on a systematic process of mainstreaming DRR in all developmental agenda and is aligned with adoption of three UN sponsored international agreements as listed below :-

- (a) Sendai Framework on DRR (Mar 2015).
- (b) Sustainable Development Goals (Sep 2015).

(c) COP-21, Paris Agreement on Climate Change (Dec 2015).

The main highlights of the NDMP are as follows :-

(a) Provides a framework and direction to the government agencies for all phases of disaster management.

(b) Concise and action oriented approach, clearly specifying responsibilities for Centre / State for different stages of all

types of disasters. Lays down measures to be adopted in short, medium and long term.

(c) For each hazard, the NDMP incorporates the priorities enunciated in the Sendai Framework under the five thematic areas for action, viz. :-

- (i) Understanding Risk.
- (ii) Inter-Agency Coordination.
- (iii) Investing in DRR Structural Measures.
- (iv) Investing in DRR Non-Structural Measures.
- (v) Capacity Development.

(d) The response part of the plan has identified eighteen broad activities which have been arranged into a matrix to be served as a ready reckoner.

(e) The NDMP is a dynamic document in the sense that it will be periodically improved in keeping with the emerging global best practices and knowledge bases in disaster management.

Disaster Risk Reduction and Mitigation

Considering the fact that disasters and development are two sides of the same coin, the approach has to be in unison. Sustainable development cannot be achieved unless disaster risk is reduced. As per Global Assessment Report on DRR 2015 released by UNISDR, in recent years, there has been a rapid increase in loss of economic assets and jobs from disasters, particularly in developing and low / middle-income countries.

It is also estimated that economic loss from disasters is growing faster than GDP per capita implying that risk of losing wealth in disasters far exceeds the rate at which wealth is being created. Yet, it is ironical that despite the magnitude of potential costs and loss of income, reducing disaster risks is often perceived as a lesser priority than fiscal stability, tackling inflation and unemployment. For a country like India which is at a threshold of numerous initiatives for economic growth, with focus on development of infrastructure, it is imperative that new investments incorporate DRR and mitigation measures.

As India aspires to be disaster resilient, considering its vulnerability due to recurring hydro-meteorological hazards and

droughts, lot of efforts have been made to build capacity for mitigation and effective response. An example of success story is DRR and mitigation effort in the field of cyclone. The State of Odisha suffered loss of over 10,000 lives because of Super Cyclone in 1999, however, when Cyclone Phailin (2013) and Hud Hud (2014) struck coastal belt of Odisha and Andhra Pradesh, due to accurate forecasting and timely evacuation of over 1 million people, this region had very few casualties; 44 and 124 respectively. To meet future challenges of achieving sustainable development, various initiatives are underway to improve India's resilience to disasters.

Understanding Risk

The following measures are being taken for understanding risks :-

(a) Preparation of Hazard Risk & Vulnerability Assessment (HRVA) Maps and Atlas.

- (b) Updating of India Disaster Resource Network (IDRN).
- (c) Preparation of India DRR Report.
- (d) DRR Mainstreaming :-

(i) Undertake HRVA and Cost Benefit Analysis of Investment in DRR which becomes a useful input to formulate development / investment plans.

(ii) Focus on land use, urban and spatial planning, particularly for proposed Smart Cities.

Improving Disaster Risk Governance

Following actions are being undertaken to improve the disaster risk governance :-

(a) Strengthening SDMAs and DDMAs.

(b) Aligning SDMPs with the NDMP and preparation of DM plans at district/ block/village and city/town/municipal/ward level. Appointment /nomination of Nodal Officers for DM.

(c) Sensitising elected officials, local self governments and panchayats.

(d) Legislate mandatory safety audit especially for the lifeline and critical buildings and infrastructure (power/communications installations, hospitals, schools, government offices). (e) Strengthen mechanism for compliance of building codes in risk prone areas.

Investing in Risk Reduction

Actions undertaken in risk reduction are :-

(a) On the lines of National Cyclone Risk Mitigation Project (NCRMP), Earthquake, Landslide and Flood Risk Mitigation Projects to be launched.

(b) As a pilot project, an Earthquake Resilience Model District Programme is being undertaken in Tripura.

(c) Programme for Sustainable Reduction in Disaster Risk in 10 multi-hazard prone districts of the country has been launched.

(d) Some of the States have rolled out 'School Safety Programmes', while the National School Safety Programme Phase-2 too has been launched.

(e) Effort is on to develop five regional centres of excellence on DM in selected apex academic/technical institutions for research and development.

Enhancing Disaster Preparedness

Disaster Preparedness is one of the important tenets of DRR and mitigation initiatives of the Government, involving all stakeholders. Some of the institutional measures are :-

(a) 12 NDRF battalions (including two recently raised) are deployed in hazard prone States, strengthening of SDRF, imparting DM training at State Administrative Training Institutes (ATI) and training centres of Central Armed Police Forces (CAPFs).

(b) DM training of Civil Defence, Home Guards, NCC, Nehru Yuva Kendra Sangathan (NYKS) by NDRF battalions and at State/ CAPF ATIs.

(c) Involvement of Urban Local Bodies (ULB)/wards, block/ village level officials in various awareness programmes.

(d) CBRN disaster preparedness in all vital institutes/ establishments.

Initiatives by States

States have taken up various initiatives such as launch of innovative awareness programmes, Geographic Information System (GIS) enabled tools for speedy dissemination of warning, harnessing technological advancements for DRR and mitigation, addressing school safety and medical emergency issues through capacity building of community through NGOs.

DM Education and Capacity Building of Professionals.

Some of the initiatives which are in hand are :-

(a) Inclusion of DM in curriculum of schools through CBSE and State Boards.

(b) Establishment of DM department in selected universities/ technical institutions.

(c) Syllabus revision in engineering and architectural institutes to include seismic engineering and effects of landslides and floods.

- (d) Capacity building of DM professionals.
- (e) Masons and other artisans' certification programmes.

Role of Community/NGOs/Volunteers

Awareness programmes such as training of volunteers, as per Community Based DM (CBDM) initiatives by NGOs are vital. Large scale use of social media for information, education and communication (IEC), collection of data and inputs during response stage is invaluable.

Role of Corporates

Besides assisting during relief and rehabilitation stage of a calamity, as part of Corporate Social Responsibility (CSR), corporates can play an important role towards DRR and mitigation, CBDM initiatives such as awareness programmes and training through NGOs. Corporates can also contribute towards initiatives such as Internet of Things (IOT) for effective DM, innovate tools and research and development projects on forecasting and last mile connectivity.

Leveraging Science and Technology

Early Warning and Forecasting. India has made significant progress in exploiting advanced technology in formulating a robust

early warning and forecasting mechanism, particularly in the field of meteorological forecasting of rains, floods, cyclones and avalanches. Initiatives of Indian Meteorological Department (IMD), Central Water Commission (CWC), Indian Space Research Organisation (ISRO), Indian National Centre for Ocean Information Services (INCOIS) and Snow and Avalanche Study Establishment (SASE) have enabled extended prediction, customised (Agromet, Aviation, DM etc.) and specific efforts have been put in place for Amarnath, Mansarovar, Char Dham pilgrim routes through varied dissemination modes. There is a need to further enhance the efforts to factor in other parameters so as to accurately predict and forecast landslides and droughts, besides continuing to participate in global initiatives to develop 'Forecasting and Early Warning System' for earthquake.

Space Technology and GIS Applications. Satellites for earth observation, communication, meteorological and navigation applications provide useful inputs for hazard and risk assessments, response, relief and disaster impact assessment. Disaster Management Support (DMS) of ISRO and National Database for Emergency Management (NDEM) located at National Remote Sensing Centre (NRSC) are providing real time inputs to the States and other stakeholders. Bhuvan Portal of ISRO is the largest satellite based web GIS portal.

Reliable Communication including Last Mile Connectivity. For immediate dissemination of early warning it is imperative to achieve last mile connectivity to affected populace. At times of natural disasters, the first casualty is communication which severely impacts rescue and relief effort. Therefore, development of a dedicated and robust Disaster Communication Network with inbuilt redundancy is being given a high priority. NDMA has recently launched V-sat based Phase 1 of National Disaster Management Services (NDMS) Project for 120 locations (all States, Union Territories and 80 most hazard prone districts).

Regional/International Initiatives

NDMA had coordinated rescue, relief and reconstruction work activities in the aftermath of the Nepal earthquake on 25th April 2015. A total of 16 NDRF teams were deployed for rescue while NDMA coordinated despatch of over 1400 metric tonne of relief material, besides extending technical support through deployment

of experts from India. NDMA, in May 2016 also coordinated despatch of relief material to Sri Lanka for flood victims and in June 2016 despatched humanitarian aid for the earthquake affected people to Ecuador.

Since disasters do not recognise geographical boundaries, major disasters may often simultaneously affect several countries. Hence, in spirit of commitment to Sendai Framework, it is endeavoured to develop close cooperation and coordination at the international level in all spheres of DM. In the aftermath of Nepal earthquake, India organised the first South Asian Annual DM Exercise (SAADMEx) and SAARC regional workshop in Nov 2015. India has embarked to take forward this initiative to develop capability and capacity for a joint response.

Other Recent International Initiatives

Initiatives undertaken recently in the field of DM at international level are :-

- (a) MoU with Indonesia (Oct 2013)
- (b) MoU with ASEAN (Nov 2014)
- (c) Ufa Declaration by BRICS (Jul 2015)
- (d) Forum for India-Pacific Islands Cooperation (Aug 2015)
- (e) Agreement with Russia (Mar 2016)

(f) India hosted the 2nd BRICS Ministries meeting at Udaipur on 22-23 Aug 2016 wherein a joint action plan has been formulated.

(g) India is hosting the 7th Asian Ministers Conference for DRR (AMCDRR) at New Delhi from 2nd to 5th Nov 2016 with an aim to formulate and adopt an Asian Regional Plan for implementation of Sendai Framework.

Role of Armed Forces

The Armed Forces are mandated to respond to rescue and relief operations in a situation of any major calamity. In such an eventuality, whether in India or abroad, decision to commit the Armed Forces is taken at NCMC chaired by the Cabinet Secretary. Deployment of Armed Forces for any major calamity including

launch of Humanitarian Assistance and Disaster Relief (HADR) operations abroad is coordinated by HQ Integrated Defence Staff (IDS) as per decision taken at the Defence Crisis Management Group (DCMG), headed by Chief of Integrated Defence Staff to Chairman, Chiefs of Staff Committee (CISC).

So as to harmonise effort of the armed forces, they are being involved in conduct of major mock exercises (including Table Top Exercises), being conducted by the NDMA at the state level, with full involvement of the State Government and participation of all stakeholders viz. NDRF, SDRF, Civil Defence, Fire Services, Red Cross, CAPFs / Coast Guard (where available). So as to streamline various Standard Operating Procedures (SOPs) of joint response and to contribute towards awareness of people in the disaster prone areas. HQ IDS too has steered conduct of such exercises this year. The first such exercise was conducted by the Army as lead agency for floods scenario at Guwahati in June 2016. Navy conducted HADR exercise in a cyclone scenario at Vizag in August 2016 while the Air Force has conducted earthquake scenario exercise at Bhuj in September, 2016.

Conclusion

India has indeed come a long way in terms of enhancing our capacity to respond to various types of disasters which we face almost every year. Considering the size of our country and our vulnerability to almost all types of natural disasters, the focus of India's efforts on DRR and mitigation remains a big challenge. Since India has embarked on various initiatives entailing huge investment on development of infrastructure, it is important that disaster resilience should be cornerstone of India's strategy of achieving sustainable development. Harnessing technological advancements too is likely to play a vital role in preventing and reducing impact of a disaster. In this regard, NDMA has built strong partnership with a number of technological institutes and expert bodies to address various challenges. In the spirit of India's commitment at various International forums and in line with tenets of the NDMP, number of initiatives have been taken up by NDMA and the States to involve local administration, NGOs, corporates and most importantly the communities to enhance their level of awareness so as to prevent human-induced disasters and build capacity to withstand impact of disasters.