Disaster Management Community

Solution Exchange for the Disaster Management Community
Consolidated Reply

Query: Handling Urban Disasters - Experiences

Compiled by G. Padmanabhan, Resource Person and Nupur Arora, Research Associate
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From V. R. Raghavan, Satyam Foundation, Hyderabad
Posted 18 October 2007

Dear Members

The recent terror strikes in Hyderabad and we witnessing increased terror strikes in other major cities like Mumbai and Delhi, creating need for better planning to respond to such emergencies by the government, civil society and more so the people/ citizens. In adding to these woes, the regular floods, building collapses and fire are making us to think how to manage urban disasters in the country.

Satyam Foundation Hyderabad has constituted a study on disaster management plans for urban centres like Hyderabad. Disaster Management in urban centres is altogether a different cup of tea in comparison to the rural areas. In rural areas, the disaster response, relief, rehabilitation and mitigation is under the single command control of the District Collector. All the stakeholders are responsible and accountable to the district collector. Where as in urban areas, there is no such mechanism and thus there are very few chances of effective coordination. The study focuses on understanding the different roles played by different stakeholders and their operational command and procedures followed and capturing the stakeholder's perception of their roles and responsibilities and how to manage such disasters.

I am interested for members from the disaster management community to specifically share information on the following:

- Mechanisms and processes that can be developed to enable disaster risk reduction in urban areas.
- Examples of standard operating procedures followed by different agencies while dealing with urban disasters.
- Experiences of any urban disaster management plans from cities in India and elsewhere in developing countries, which focus on Natural Disasters and also include communal riots, terrorist attacks, bigger accidents etc.

I am looking forward to members' valuable suggestions and experiences.

Responses were received, with thanks, from

1. **Nupur Bose, Department of Geography, A.N College, Patna**

2. **Anand S Arya, Ministry of Home Affairs, New Delhi**
3. **Manish Mehta, Plan International, Bangkok**
4. **N. K. Agarwal and Mandira Agarwal, Geological Survey of India, Dehradun**
5. **Piyoosh Rautela, Disaster Mitigation and Management Centre, Dehradun (Response 1 ; Response 2)**
6. **Sarat Panda, United Nations Development Programme (UNDP), Gandhinagar**
7. **Kumar Deepak, United Nations Development Programme (UNDP), Patna**
8. **Shivangi Chavda, SEEDS, New Delhi**
9. **Vandana Tripathi, Sahbhagi Shikshan Kendra, Lucknow**
10. **Dipankar Dasguupta, DISHA, Kolkota**
11. **Keya Mitra, Department of Architecture, Bengal Engineering and Science University, Howrah**
12. **A. K. S. Parmar, Disaster Management Institute, Bhopal**
13. **Garima Aggarwal, GoI-UNDP Disaster Risk Management Programme, New Delhi**
14. **Jaidev Deshpande, Vishwakrama Institute of IT, Nagpur**
15. **Sushil Gupta, Risk Management Solutions Internationals, Noida (Response 1; Response 2)**
16. **Ranjini Mukherjee, United Nations Development Programme, (UNDP), New Delhi**
17. **Manish Yaduvanshi, United Nations Development Programme (UNDP), Meerut**
18. **Toms K. Thomas, Disaster Management Unit Evangelical Social Action Forum (ESAF), Trichur**
19. **Sudhir Kumar, United Nations Development Programme (UNDP), Mumbai**
20. **Prabhakar Sharma, Government of Karnataka, Mangalore**

Further contributions are welcome!

Summary of Responses

Disaster risk reduction in urban areas is an imperative issue. Recognizing this fact, members gave wide ranging and insightful responses to the query seeking experiences handling urban disasters.

Respondents reiterated the importance of this issue by mentioning that unlike close knit rural communities armed with time tested traditional knowledge and coping mechanisms, the urban communities lack cohesion. Most of the members felt that 'Urban Disasters' is larger issue from the perspective of the sectorally fragmented population and the complexities attached to the large cities.

Members shared experiences of handling disasters in small and big cities. For example, an NGO has carried out Urban Risk Management in cites like **Goplapur, Puri, Shimla and Port Blair**, wherein they identify most vulnerable spots in city and make block disaster management plans. Discussants opined that there is a need to create and adopt different strategies for handling disasters for "sites" already developed and "potential sites" under development.

Discussing various mechanisms and processes to enable disaster risk reduction in urban areas, participants brought out several recommendations. They suggested strengthening the **institutional mechanism** at city level by creating City/District Disaster Management Authorities, which may form

various working committees of various sectoral functionaries. To ensure immediate response to disasters, they advised defining responsibilities and reporting system for departments such as the police, fire, transport, communication, NGOs, the public works, Municipal Corporation, and the revenue. In **Delhi,** the government has formed the Delhi Disaster Management Authority to ensure effective disaster management in the city and under the GoI-UNDP Urban Earthquake Vulnerability Reduction Project, various cities have created City Disaster Management Authorities, in several cities such as **Mumbai, Surat, Ahmedabad and Delhi.**

Citing the experience from Patna, which has become an unplanned, congested conglomeration of localities, lacking the basic ethics of town planning techniques, members emphasized the need for **community awareness and participation** in the process of urban planning to mitigate urban disasters. They suggested creating community-level help groups and training them on first aid, fire fighting, search and rescue, etc. These groups could include youth, medical professionals from state hospitals, local police, and fire safety officials who would act as first responders during any emergency. This group could also create awareness among the community, particularly in schools, about disaster preparedness. These Community groups can be educated and trained using various methodologies. Respondents mentioned how the Government of **Uttar Pradesh** under the GoI-UNDP Disaster Risk Management Programme has taken up such activities through its Community Awareness and Disaster Preparedness and in **Pune,** e-learning companies along with NGOs and the police are creating e-learning modules for local police. Similar e learning modules can be prepared for educating the communities on disaster management.

Members also discussed the **role of NGOs and other stakeholders** in urban disaster management. They felt NGOs/private sector organisations could advocate for the inclusion of urban disaster management and early warning systems into the City Planning process. Additional research sows that a private sector chemical manufacturing company in Barbala district of **Uttar Pradesh**, carries out disaster preparedness initiatives for the city with support from the local community.

Respondents emphasized the importance of **preparedness in urban centres**, to protect against both natural disasters and terrorist attacks. While suggesting various preparedness measures, they stressed the need for strong enforcement mechanisms, without which any initiative will remain ineffective; suggestions included:

- Strengthen the emergency response systems (i.e. fire and emergency services) in cities
- Proper identification, assessment and analysis of risk and vulnerability
- Establish elaborate response mechanisms at city level with clear Standard Operating Procedures for various government and non-government departments
- Conduct mock drills to ensure the workability/efficacy of the preparedness and response plans

Highlighting the issue of **urban planning**, members expressed their concerns that until now mega cities have received major attention, but studies show that bulk of urban population growth is likely to be in smaller cities and towns, whose capacity for planning and implementation is exceedingly weak. They recommended preparing city master plans with long term, broad visions for sustainable use of urban space taking in to account factors like migration and population growth, vulnerability to disasters, etc. Moreover, they felt Master Plans needs to include guidelines on constructing earthquake resistant buildings, better water and sanitation supply structures, systems for waste disposal, storm water channels, drainages systems, and well constructed roads. Discussants stressed the importance of frequently revising these Master Plans; suggesting that Disaster Management needs to be mainstreamed into development planning by regulating land-use zonation according to the exposure of risks, updating and enforcement of building byelaws as per disaster resistance codes, and retrofitting of life-line buildings and other important buildings. Such practices may help reduce risk by improving the condition of existing buildings and construction of new buildings.

Additionally, discussants outlined the following **strategies** for effective handling of urban disasters:

- Include damage prevention and reduction strategies as a part of disaster preparedness
- Monitor construction quality and infringement of bylaws and I.S. Codes
- Simplify and disseminate I.S. Codes among the masses, to help them better understand and apply these codes
- Have a pre-defined coordination and communication system or incident command system in place
- Use Geographical Information Systems and remote sensing to draw maps of cities- locating roads, hospitals, fire stations, etc.- to assess the vulnerabilities of buildings, infrastructure and people and help the authorities take decisions during emergencies
- Develop a detailed disaster risk database to facilitate specialized studies and assessments at all levels of planning
- Conduct a hazard risk vulnerability analysis, including techniques to assess the vulnerabilities of building, infrastructure and people
- Hold training and capacity building sessions for policy makers, implementers and those involved in the construction industry, including engineers, architects, masons, builders and town planners to promote disaster resistant construction technology as part of good urban planning
- Build a culture of risk transfer and insurance against disasters among the vulnerable communities
- Encourage volunteerism at the city level by rewards etc and make task forces to respond during disasters.

Finally, members felt that handling urban disaster is an important issue which needs an urgent attention at all levels. The urban infrastructure in Indian cities is increasing at an alarming rate along with the risks related to natural and man-made hazards.

Comparative Experiences

Delhi

Strengthning Institutional Mechanisms, Delhi *(from Garima Aggarwal, GoI-UNDP Disaster Risk Management Programme, New Delhi)*
The government has under taken many disaster risk reduction initiatives through various projects. The Delhi Disaster Management Authority (DMA) was set up along with district committees and community level committees being formed. DMA and the different committees now organise mock-drills at the state, district and community level to strengthen response mechanism and coordination system in the city.

Maharashtra

E-Learning for Police Officials, Pune *(from Jaidev Deshpande, Vishwakrama Institute of IT, Nagpur)*
Some e-solutions and e-learning companies are working with NGOs and the local police to build e-learning programmes for the police and public. These programmes are interactive, make use of various pedagogic techniques to make effective presentations based on tackling the commonest problems in traffic and accidents.This modle has been succcesfully educated police and public on traffic management and accidents.

Uttar Pradesh

Reducing Disaster Risk initiatives by the Government , Sitapur *(from Vandana Tripathi, Sahbhagi Shikshan Kendra, Lucknow)*
Under the GoI-UNDP Disaster Risk Management Programme a series of measures have been under taken at the community, local government and other levels, to create a culture of disaster preparedness and risk reduction. One step has been the creation of a database on the water level and rainfall amount, which is made available through an online centre. This has resulted in increased community preparedness and disaster mitigation activities across the project states. Read more

City of Babrala Carries out Community Based Disaster Preparedness Activities *(from Nupur Arora, Research Associate)*
A chemical manufacturing company along with the local community is carrying out Community Based Disaster Preparedness initiatives in city. They did assessment surveys, identified hazards and analyzed data, and then based on this, designed disaster preparedness and mitigation activities. Next the company and community carry out sensitization programmes and mock drills for schoolchildren, residents and women to train them to respond to disasters, thus ensuring disaster preparedness in the city,

Multiple States

Urban Risk Management, Gopalpur, Puri, Shimla, and Port Blair *(from Shivangi Chavda, SEEDS, New Delhi)*
The SEEDS programme identified the most vulnerable spots in these four cities by evaluating and assessing physical, social, economic and environmental vulnerabilities and the capacity of each block in the city. They then strengthen each city's capacity through training and capacity building. Finally they developed a Disaster Management plan for each block with the help of key stakeholders and integrate these to make a composite City Disaster Management Plan. Read more

Urban Earthquake Vulnerability Reduction *(from Ranjini Mukherjee, United Nations Development Programme, New Delhi)*
The Ministry of Home Affairs, GoI with support from UNDP is implementing a project named Urban Earthquake Vulnerability Reduction Project (UEVRP) in 38 cities across the country aiming at reducing earthquake risk in urban areas. The project closely works either with Municipal Corporations or District Administration in respective cities. City Disaster Management Plans have been prepared in batious cities. Read more

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Related Resources

Recommended Documentation

State of World Population 2007 (*from A. K. S. Parmar, Disaster Management Institute, Bhopal)*
Report; UNFPA, New York; 2007
Available at http://www.unfpa.org/upload/lib_pub_file/695_filename_sowp2007_eng.pdf (PDFf 2.82 MB)
The report mentions that future population growth would be maximum in Asian towns and cities, making them more vulnerable to natural and manmade disasters.

The Disaster Management Act 2005 *(from Vandana Tripathi, Sahbhagi Shikshan Kendra, Lucknow)*
Act; Ministry of Home Affairs, Government of India, New Delhi; 2005
Available at http://www.nidm.net/DM_act2005.pdf (PDF Size: 1.67 MB)
The Act covers the whole country and address the issue of management of disasters and plans for disaster preparedness in India including cities.

from Ranjini Mukherjee, United Nations Development Programme, New Delhi

Mumbai City Disaster Management Plan
Plan; Releif and Rehabilitation Division, Revenue and Forest Department, Ministry of Maharashtra
Available at http://mdmu.maharashtra.gov.in/pages/Mumbai/mumbaiplanShow.php
The plan highlights various disasters the city is prone to, identifies vulnerable areas and discusses disaster preparedness and mitigation measures for the city

Surat City Development Plan
Plan; Surat Municipal Corporation and Surat Urban Development Agency; Permission Required: No.
Available at http://www.suratmunicipal.org/content/downloads/citydevelopmentplan/main.shtml

Highlights various important development initiatives in the city and also discusses the affect of various disasters have struck the city and brings out development plans.

Ward Disaster Management Plan
Plan; UNDP; Gujarat
Available at http://www.egovamc.com/UEVRP/13WDMP/Ward_Disaster_Management_Plan.pdf (PDF 128 KB)

Document explains the process of making Ward Disaster Management plans and highlighting roles of various disaster management teams at various levels taking a case of Gujarat.

Ahmedabad City Disaster Management Plan
Plan; Ahmedanad Municipal Corporation
Available at http://www.egovamc.com/UEVRP/9MDRP/9.asp

The plan highlights the various disasters the city is prone to, identifies vulnerable areas and discusses disaster preparedness and mitigation measures for the city

Disaster Management Plan, North East District, Delhi
Plan; by Office of Deputy Commissioner, North East Delhi.; 16 May, 2005
Available at http://data.undp.org.in/dmweb/plans/DDMP_ND_VOL1_VERSION1_0.pdf (PDF 1.15 MB)

Highlights district profile and vulnerability and lays out institutional mechanisms for disaster management and the district's disaster management plan

Standard Operating procedures of Urban Disaster Management in Municipality of Bandung, Indonesia, Indonesian Disaster Mitigation Project
Book; Asian Disaster Preparedness Centre; Bangkok; March 2000
Available at http://www.solutionexchange-un.net.in/drm/cr/res18100701.pdf (PDF 358 KB)

Taking the case of Bandung city of Indonesia, the document shares knowledge and experiences from national demonstration projects on disaster mitigation in target countries of Asia.

Recommended Organizations and Programmes

Urban Earthquake Vulnerability Reduction Programme Programme, United Nations Development Programme, New Delhi *(from Kumar Deepak and Ranjini Mukherjee)*
Tel: 91 11 24628877; Fax: 91 11 24633042 http://data.undp.org.in/dmweb/uverp-rpts/ProgmDocmnt.pdf (PDF 81.4 KB)

Aims at reducing earthquake risk in 38 cities across the country and works on various aspects of disaster management encompassing preparedness, response and mitigation

Ministry of Home Affairs (MHA), Government of India, New Delhi *(from Ranjini Mukherjee, United Nations Development Programme, New Delhi)*
North Block, Central Secretariat, New Delhi 110001; Tel.: 23092011/161; Fax: 23093750/2763; websitemhaweb@nic.in; http://www.ndmindia.nic.in/

Produced guidelines proposing amendments for Building Rules, Development Control and land use Regulations and Town and Country Planning Act for urban disaster safety.

Sustainable Environment and Ecological Development Society (SEEDS) India, New Delhi *(from Shivangi Chavda)*
D-11, Panchsheel Enclave, New Delhi 110017; Tel: 91-11-26498371, 41748008; Fax: 91-11-26498372; http://www.seedsindia.org/our_campaign.htm

Working towards making communities resilient to disasters, they have carried out Urban Risk Management Programmes in various cities of India

Government of India-UNDP Disaster Risk Management Programme, New Delhi *(from Vandana Tripathi, Sahbhagi Shikshan Kendra, Lucknow)*
55 Lodhi Estate, New Delhi 110003; Tel.: 46532333; 24627612; http://www.undp.org.in/index.php?option=com_content&task=view&id=80&Itemid=163

Aims to reduce vulnerabilities of communities at risk to natural disasters in 169 multi-hazard prone districts of 17 India states, project is spread to major big and small cities.

National Disaster Management Authority (NDMA), New Delhi *(from A.K.S. Parmar, Disaster Management Institute, Bhopal)*
Centaur Hotel, Near IGI Airport, New Delhi 110037; Tel: 25655012; www.ndma.gov.in

Authority has issued guidelines for flood management and has constituted various committees to tackle the problem of urban floods.

From Manish Yaduvanshi, United Nations Development Programme, Meerut

Nehru Yuva Kendra Sangathan (NYKS), New Delhi
Ministry of Youth Affairs and Sports, Government of India, East Plaza, Indira Gandhi Indoor Stadium, New Delhi 110002; www.nyks.org

Forms Youth Clubs for nation building activities by developing their values and skills and carries out development programmes in priority sectors like disaster management in cities.

National Service Scheme, Ministry of Youth Affairs and Sports, New Delhi
501, B-Wing, Shastri Bhawan, Dr. Rajendra Prasad Road, New Delhi 110001; Tel.: 91-11-23383292; Fax: 91-11-23071193; http://yas.nic.in/yasroot/schemes/nss.htm

Youth service programme aims at arousing social consciousness among youth and carrying out development activities including disaster mitigation and preparedness on cities.

From Sushil Gupta, Risk Management Solutions Internationals, Noida

Indian Institute of Technology, Roorkee
Uttaranchal, 247667; Tel: 91-1332-272349, 274860; Fax: 91-1332-273560 http://www.iitr.ac.in/#

The Department of Earthquake Engineering at IIT contributed to the first level of seismic microzonation of Delhi.

India Meteorological Department, New Delhi
Mausam Bhawan,Lodhi Road, New Delhi 110003 ; http://www.imd.ernet.in/main_new.htm;

National Meteorological Service and principal government agency in all matters relating to meteorology, they contributed to the first level of seismic microzonation of Delhi

RMSI Private Limited, Noida
A-7 Sector 16, Noida 201301; Tel: 91-120-251-1102; Fax: 91-120-251-1109, 251-0963; http://www.rmsi.com/press/undp_partners_rmsi_develop_disaster_risk_profile_for_maldives.asp

Developed Disaster Risk Profile for various parts of the world, including the Maldives for UNDP, aims to help UNDP and government to plan strategies for disaster mitigation

Related Consolidated Replies

Improving Preparedness and Community Participation, from N. C. Vij, National Disaster Management Authority, Government of India, New Delhi. - (Experiences). Disaster Management Community,

Issued Issued 29 May 2007. Available at http://www.solutionexchange-un.net.in/drm/cr/cr-se-drm-29050701.pdf (PDF,311 KB)

Shares experiences for improving preparedness and community participation levels for efficient management of disasters

Natural Hazard Risk Awareness and Reduction Programmes, from Amit Tuteja, SEEDS, New Delhi. - (Experiences). Disaster Management Communtiy,
Issued 20 November, 2007. Available at http://www.solutionexchange-un.net.in/drm/cr/cr-se-drm-20110701.pdf (PDF,122KB)

Shares experiences of Natural Hazard Risk Awareness and Reduction Programmes and seeks advice on strengthening government role in disaster risk awareness.

Responses in Full

Nupur Bose, Department of Geography, A.N College, Patna

The need for a mechanism for effective urban disaster management is being increasingly felt in Patna. Patna has become an unplanned, congested conglomeration of localities, sans the basic ethics of town planning techniques. As a result, the proportion of vehicles to roads is abnormally large, quality of roads and building bye-laws have been compromised with. Patna is located in an active seismic zone; hence any earthquake of a magnitude of Richter scale 4.5 and above will spell instant doom to the thousands of inhabitants that have come to live in high rises within the last 10 years. Since seismic events are an eventuality in towns like Patna, the initial step suggested would be-

- To create community-level help groups and the members be drawn from the youth of each locality or *mohalla.*
- These help groups can be trained by paramilitary and other such organizations, in matters of rescue procedures, first-aid, etc. and can work in tandem with the disaster management cell of the state govt., the fire fighting dept., state hospitals, and police. In fact, these groups can be the first available hands to the rescue work.
- To motivate these self-help groups, regular meetings, trainings, awards and certificates that would support their employability, are also suggested.
- To utilize trained community help groups in creating awareness among the public, particularly in schools, about the preliminary precautionary steps to be taken in anticipation of the onset of disasters.

Community participation would aid and enhance the governments' efforts in any form of disaster management.

Anand S Arya, Ministry of Home Affairs, New Delhi

The query you have raised is of very great importance in most urban areas in the country. I am not so concerned with terrorist strikes which in most cases cause local damage though the Psychological trauma is widely spread. But what can happen in a natural disaster like earthquake can be totally devastating to a city as a whole. An example is that of the city of Tangshan, where 242,000 human lives were lost in 1976. The whole city had to be discarded and rebuilt in three localities close by after the event. Great lesson can be learnt from the damage scenario that happened in the city of Kobe, Japan in 1995 (see inset).

To deal with the risk in such major cities from earthquakes, I suggest the following institutional structure:- A *City Disaster Management Authority* including Secretary (Urban Development), the Mayor, the Divisional Commissioners, Municipal Commissioners and the Collectors, under which they could have a working committees of various sectoral functionaries. The major mitigation issues to be taken care of will include:-

- Structural and non-structural safety of all hospitals and retrofitting as found necessary
- Structural and non-structural safety of all school and college buildings and upgrading and retrofitting as found necessary so that these could serve as shelters during emergency.
- Checking on safety of various services and their upgrading so that their losses are minimized and service may be kept in functioning condition.
- Identification of open spaces which could be used for bringing out the affected people for sheltering purposes and the evacuation routes to be identified and notified. Many other actions as may be required so as to minimize the damages and losses.
- Implementation of safe building bylaws for all new constructions and incentives to the citizens for retrofitting their unsafe buildings will be important action points.
- Old city areas are particularly vulnerable and may need special attention.

These points are in addition to what has already been provided in the Disaster Risk Management Programme towards *preparedness* of the communities.

Manish Mehta, Plan International, Bangkok

You have really touched up on sensitive issue in "disaster management". Apparently, it looks and is assumed that cities are most equipped with disaster management plan and contingency plans. However, in most of the cities "disaster management" plans are weaker or just on paper.

City population is having different vulnerability. Unfortunately, the urban population is growing in India at much faster pace.

When we talk about "urban disaster management", it touches many stakeholders and most of them are government sectors. This is really too big issue to work on.

We as NGOs can contribute by:

1. Strong **"advocacy"** of **"urban disaster management"** and **"early warning systems"** inclusion in government /city planning influenced by communities.

2. I guess the key area we need to address is **"Land Use planning"** or "city planning" , unfortunately in India or rather in many developing countries the cities are growing on its own and building by-laws and other town planning influence is on limited area of city. Most of the suburbs remain unplanned and over a period, it becomes the part of city.

3. **Violation** of **building by-laws** is very common in India and it is another threatening factor that put the mass population on big vulnerable scale. The violation of bylaws is on a large scale by politicians and officers.

4. There are plenty of cases in metro cities that fire kills hundred of people and no help could mobilise in time. Classic example is **Delhi fire** in **"lajpat market"** few years ago, the reason "fire fighter could not go in to the streets" so they were spectators.

5. Many of India cities live with significant number of population in "slum" and unfortunately, many of the slums are being developed in flood planes. Example is "Surat- Gujarat" flood 2006. It is

classic example of **"unprepared stakeholders".** Many people living on bank of river did not get message or did not under stood the early warning message given by government authority. There was no follow up of message. There was no alternative arrangement or evacuation plan. No rescue mechanism was in place.

N. K. Agarwal and Mandira Agarwal, Geological Survey of India, Dehradun

Earthquakes induced damages remain to be the biggest threat to men and infrastructure in urban areas with coastal & non-coastal, mountain and plain areas having different characteristics. The main culprit for high earthquake induced damages is non-adherence of building byelaws and I.S. Codes by users as well as agencies responsible for its implementation and compliance. Where I.S. Codes are not available or require modification the same need to be done on priority and placed in public domain as part of public awareness and if required the BI.S. could be financially compensated by the state. This financial support would be far less than what the state incurs on distribution of relief in the event of a disaster.

Urban areas and nodes have transformed into a ready made time bomb to explode any time due to high concentration of dwelling, infra structure and population density in the event of any kind of disaster man made or natural.

We need to create and adopt different strategies for "sites" already developed and "potential sites" under development/future development, for this de-congestion in old developed sites needs priority.

The situation is very alarming a fire tender or even an ambulance cannot avail a free and priority access to the site or its destination. High intensity disasters are notorious for having impact time of few minutes if not seconds only and their management requires matching “Zero response Time” to reduce and prevent damages. If this cannot be done then all efforts turn into statistics gathering, relief and rescue operations. Disaster management needs to be a system of prevention and reduction of damages and not be an operation of relief and rescue. Pre-Disaster mitigation should direct all efforts to reduce high threat perception by switching to strict compliance of byelaws and also by (1) spreading public awareness and (2) subsidy support to individuals, group housing schemes.

Today the biggest question is how we monitor poor quality of construction and infringement of byelaws and I.S. Codes. How to create a mechanism that arrests this breakdown at the cost of public safety?

We talk of retrofitting because the bylaws and building codes have not been followed and after construction neither the builder/contractor nor the dweller is interested in the safety norms till disaster strikes. It is surprising tall civil structures and multi storied dwelling lack fire safety escape routes and preparedness to combat fire hazard in the event of fire in the basements particularly when basement is being used as a parking area.

I think we need to do much more in Damage Prevention and Reduction Strategies as part of pre-disaster management preparedness. The completion certificate remains just a formality on a paper and is not issued before the property is registered or any infra structure is commissioned. Such compliance would no doubt improve quality of construction and increase cost. This seemingly large investment would certainly reduce the heavy financial burden which has to be incurred after the disaster strikes and to compensate the loss of men and material. Further it is high time cost of “human life” is also taken in damage cost assessment so as to give a realistic dimension and scale of any disaster. The statistical number of life lost and causality does not help in anyway. Such assessments fail to highlight the main cause of disasters – Man Made or Natural.

Piyoosh Rautela, Disaster Mitigation and Management Centre, Dehradun *(response 1)*

To carry forward what Mr. Manish Mehta had mentioned in his response on Urban Disaster Management Plans, I would like to say that the rural communities are generally close knit, have clear cut kinship bonds and these communities are armed with time tested traditional knowledge and coping mechanisms. All these make interventions in the rural areas rather easy. These are generally more receptive.

On the other hand the urban communities lack cohesion and its really hard to bring them to some common platform where the DM related problems can be discussed. Though highly vulnerable to disasters the urban community has a false sense of confidence that makes them believe that they can overcome the challenge put forth by disasters. Moreover being well educated they seem to know all and are not generally receptive.

So making ward and city plans is not that easy a task as it is generally said. But one has to try.

Secondly, in response to what Mr. N K Agarwal and Ms. Mandira Agarwal had mentioned, I would like to say that we all know the level of awareness amongst the masses regarding the IS codes; even the well trained engineers do not have all the codes for ready reference.

Firstly we should encourage free dissemination of the codes rather than restricting its circulation by way of hefty price tag attached to it.

Moreover there should be attempt from amongst the technocrats for simplification of the codes; so that the summary is available to the common people with essential elements that he can understand and ensure in his humble dwelling. Otherwise we are just working for the upper classes of the society who can afford to employ a structural engineer.

Unless made simple and understandable we cannot expect voluntary compliance. And unless there is voluntary compliance to law can really ensure that the ones being built are seismically safe.

Sarat Panda, United Nations Development Programme (UNDP), Gandhinagar

Urban disasters are indeed the biggest challenge the country is going to face. Recent blast at Ajmer Dargah and blast in movie theatre in Ludhiana has renewed the terrorist threat to our country. To corroborate this point further, two days back in Ahmedabad city, the Crime Branch, Gujarat state just wanted to ensure the safety measures taken by the mushrooming Mega Malls in the city. A group of officers in the guise of students, shoppers entered into the malls with knife, revolver and other arms. This has exposed the security concerns of these malls and confirmed that these malls are quite a soft terrorist target. The authority has issued 24 hour notice to these mall owners to follow the security aspects or else their license would be cancelled. Touch wood, there might not be another Hyderabad like situation in the city. Lessons learnt from such proactive measure by the authority, I think are:

- This kind of surprise security system monitoring of public places with strict enforcement of rules by the authority and law enforcement agencies can improve the scenario.
- Both print and electronic media can bring pressure on the owners of malls, cinema halls and other facilities managed both public and private parties, to follow the safety tips/guidelines.
- Handling such incidents requires a contingency evacuation plan with a clear entry and exit points demonstrated through a map, which is visible to the visitors.
- Security checking which is almost non-existent should be beefed up.
- Mock drill/evacuation drill may be one of the options to minimize casualties in case of an incident.

However, just one dimension of the disaster, as Prof.Arya has pointed out. Cities in India are prone to earthquake, flood (Surat Flood 2006) and chemical industrial disasters. Cities have to be prepared against all these disasters.

Measures which could enhance the level of preparedness of the urban centres broadly could be:

- Strengthening the emergency response system of the state such as fire and emergency services
- Proper identification, assessment and analysis of risk and vulnerability
- An elaborate response mechanism at he city/corporation level with clear SoPs for departments/officials
- Mock drills to ensure the workability/efficacy of the preparedness and response plan.
- A strong enforcement mechanism. In fact it is the absence of such mechanism responsible for our cities keep on adding to their existing unsafe building stocks.

Kumar Deepak, United Nations Development Programme (UNDP), Patna

First, I want to thank Satyam Foundation for taking this keen interest in generating this discussion. As far as Urban Disaster Management Planning is concerned, it is very difficult to implement. The residents are generally very busy in their own daily work .The visitor from other places are interested to finish their work as soon as possible. People participation is a difficult job as such.

It would therefore be useful, if we can have a plan to get information by GIS /remote sensing method and draw maps of city, roads, Hospital, Fire Stations, Police Stations with help of City Volunteers of our UEVRP Programme and others. The massive awareness through festivals, Print and Electronic Media, involvement of Schools, colleges, Clubs, Resident Association can be helpful. Brain storming sessions are most important to shape the plan after collection of resource inventory .The creation of self-motivation team of Search and rescue, first -Aid can play an important role.

Piyoosh Rautela, Disaster Mitigation and Management Centre, Dehradun *(response 2)*

I do agree to what Mr. Sarat Panda has said; the cities do increasingly face the threat of terrorist attacks and there is pressing need to take this issue seriously. But at the same time, I do feel that law and order related problems should not be mixed up with disaster related ones otherwise we are going to end up diluting both.

Shivangi Chavda, SEEDS, New Delhi

I am Shivangi Chavda, representing SEEDS India. “Urban Risk Reduction” as colleagues have mentioned is a larger issue from the perspective of the sectorally fragmented population and the complexities attached to the large cities.

Issue largely hovers upon getting the sectorally fragmented population integrated towards a larger goal of Urban Risk Management and thereby Reduction. The key to this problem lies in effective Coordination. For any Disaster Management Plan to get effectively activated is directly related to the pre defined Coordination and Communication system. The “Incident Commander “plays most critical role during Urban Disasters.

While largely, the civil defence and the Municipal disaster management get activated during disasters in cities like Mumbai, there is a delay due to various reasons. However at a micro level of a city, certain mechanisms can be systematized and worked upon for strengthening these institutions.

Urban Risk Management is being carried out in cites like Goplapur, Puri, Shimla and Port Blair by SEEDS India. SEEDS approach is to evaluate and assess the physical, social, economic and environmental capacities of each block of the city. The risk profile and resource mapping identifies the most vulnerable spots of these cities thereby required to be strengthened through Training and Capacity Building. The Disaster Management plan for each block is individually prepared with the help of key stakeholders and integrated to make a composite City Disaster Management Plan which is also in some case Municipal Disaster Management Plan.

While the above can be exemplary for small cities, the Urban Risk Assessment for Metro city requires a different treatment to the subject. The most important factor is the Community, which while in rural areas is very close, in urban areas especially in metros is heterogeneous. Community bonding being too less, the approach to Urban Risk Assessment also varies. While the Resources like Medical facilities, Fire Safety Equipments, Accessibility through Transport ad Communication are largely in place, unlike rural areas; there is absence of mechanized systems for actions during disasters.

Hence, one of the Mechanisms which can be made open for suggestion is to take advantage of this sectorally fragmented population and resources.

- Divide the city into parts. The bifurcation can be done on the basis of geographical location, density of population or the revenue bifurcations.
- Risk and Vulnerability Assessment is carried out for each such blocks
- Resources are identified for each such Block
- Capacity Assessment of each resource is carried out
- Social and Economic Profile is undertaken
- Structural Assessment of the Public Buildings
- Construction Profile of the existing Buildings
- Plan layout of each Block

The above shall expose the macro level risk assessment of each block. The stress is on developing disaster management plan for each resource existing in each of these Blocks. If the Block consists of Hospitals, Schools, government buildings, then each of this unit should have their own disaster management plan. The disaster Management plan incorporates the training of the people working in such units .Having strengthened these Public utility systems, the primary stakeholder I.e. “Community” will have relatively lesser vulnerabilities.

All these DMPs of Public Buildings can then feed into a Unit Plan and all the Unit Plans can integrate to become City Disaster Management Plan. The Unit level Plan are more area specific and is governed by micro level changes over a period of time, while the City level Plans encompasses macro level strategic systems.

Further, to address the Community at large for “Urban Risk Assessment” issues, Print media being a urban phenomenon can be extensively and effectively used to reduce Urban Risks.

Vandana Tripathi, Sahbhagi Shikshan Kendra, Lucknow

I am writing to you from Uttar Pradesh, wherein disasters, particularly flood n drought have a long history. However, the advent of disasters to urban areas is comparatively newer. As previous messages have highlighted that the government has predominantly looked upon disasters as the rural phenomenon has therefore completely neglected or I choose to say preferably ignored the complexities of urban areas. I would like to cite a few learnings from my personal experience of witnessing floods in the small town of Sitapur that is 80 kms away from the State headquarters i.e. Lucknow. I hope that this case study would help u to develop some practical insights on handling urban disasters.

The event

The rainy season for the State of Uttar Pradesh is June to September in a year. In August end (2004), the Sitapur (80 kms away from State Capital) City got flooded due to heavy rains in the night. All the low-lying areas were drowned. As projected by the local administration, about 1000 households were affected in terms of loss of life and property. In all houses water reached up to 6 ft.. It was an devastating experience in terms of water drowning several assets (in fact my office computer and fax all was spoiled

due to getting immersed into the water) Since most of the houses in the low lying areas were old and built on the sewer lines itself, water reached inside more easily

Impact upon the community

- Highly unexpected event in urban areas so community in the State of Shock esp the women & children
  Loss of life and property immense as an unprecedented event
- Chaotic conditions and lack of an immediate relief further worsened the conditions
- Widespread diseases as sewerage water reached inside houses and remained till 4-5 days
- Drinking water contaminated with the sewer and drainage water getting mingled into it, leaving behind the local communities without any water for at least a day in summers.
- Some relief was provided with the surrounding communities or people living on the upper floor
- Vulnerable groups (here I mean to refer the daily wage labourers) were worst affected as not only lost the belongings but loss of livelihood for another 15 days thereby leaving them all alone
- Women's condition was awful as they were standing out all alone to face the hardship on loss of husband, house or the only earning member
- Decaying dead bodies (human and animals) and non- suitable climatic conditions for burning the bodies further aggravated the poor conditions with bad odour and floating waste

As per the **report of the committee** formed to evaluate the causes and effect of the disaster came up with few (un)astonishing facts

- Poor planning process, absolute ignorance of building norms and standards (herein it is imp to mention that) and lack of a realistic town plan (no account of data of household etc and no sewerage/drainage plan led to creating such an havoc)
- Rainwater harvesting (havoc was created due to lack of outlet and proper canalization of the rainwater) was realized as an important reason for the same.

Initiatives taken by Government and related stakeholders

- Rain Water Harvesting has been strictly enforced through the local bodies (funds provided through State finance commission and Central Finance commission)
- Passing of Disaster Management Act 2005 & an UNDP-GOI initiated project on local Disaster management has led to appointment of nodal officials/persons at the Gram Panchayat/ Urban Local body and District Magistrate level
- Training & Building Awareness among government, Local communities, NGOs, civil defence volunteers, civil society members on disaster management as essential components of development planning
- In-depth evaluation for devastation assessment

Local community based disaster management plan process has been initiated through hazard and risk mapping using the Participatory Learning and Action tools of mapping etc

Database maintained fortnightly on water level, amount of rainfall etc which is publicly available through an online center / information kiosk called LOKVANI

In the end just to summarise my experience of being part of such a disaster, I feel that preparation of plan and mock drills would help us to survive out of those difficult conditions. Early warning systems are a precondition for the effective plan development. In order to under take these activities special cadres of people need to be built upon through capacity building. UNDP is doing a tremendous amount of work with regards to the mainstreaming of planning for urban disasters and hope that more tools would emerge from this fruitful e-discussion

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Dipankar Dasguupta, DISHA, Kolkota

I am Dipankar Dasgupta representing DISHA from Kolkata.

For cities, large or small, old or new, the planning unit is usually the ward. I have worked in developing perspective Disaster Management & Environment Management Plan for +1,000 years old cities like Cuttack.

Apart from what others members have suggested, I would suggest the following:

1. Make the unit of planning - the booth and make a 3-genration perspective plan keeping in mind the population, transport, solid waste, drainage growth factors.
2. Some sense of landuse planning & environmental greening, drainage maintenance can be handed over to the booth level with the ward member as the Chairperson before it is too late, which might be already true for many metros, other cities, who are existing on borrowed time.
3. For example, there is no attempt of public awareness on a large scale though the city and its surroundings, the industrial belts of Asansol - Durpgapur and Darjeeling District is in Zone V,
4. In metros like Kolkata, Chennai, Mumbai, Delhi, the DM Committee of the respective municipalities could use the services of experts who are living in the city for earthquake, fire, flooding and other hazard management.
5. Developing a database of such experts.
6. Devolution of power to the wards/booth committees, which should be citizen's committee.
7. Like many other cities, more than 40% of the business area in Kolkata, Burabazar, and many residentail are located in small, crowded locations where no fire tender can ever reach. In such cases, municipalities can provide high-pressure water pipes which each building having their own hose (as has been done in Kobe).
8. Terror strikes and other human made disasters can only be curbed if you have an alert and safety conscious population and since safety standards are extremely poor, one could start with this activity at the booth as well as school levels.

Keya Mitra, Department of Architecture, Bengal Engineering and Science University, Howrah

Urban communities are particularly vulnerable to natural disasters such as earthquakes due to high population concentrations, density of the urban fabric and a large stock of unsafe constructions. Despite revisions in the IS Codes, these are often flouted and we continue to create unsafe building stock. Sensitization and capacity building of professionals and all stakeholders in the building delivery process is a necessary first step towards reducing vulnerabilities. The second intervention has to happen in the physical built environment through the identification of deficient buildings and structures that have then got to be retrofitted/replaced in a prioritized manner. However, neither an adequately equipped professional community, nor a sound legislative backdrop can contribute to a safe physical environment in the absence of a robust enforcement regime.

The identification of seismically vulnerable buildings and neighborhoods needs careful attention. We have to develop our own set of assessment tools that can help broadly identify vulnerabilities in buildings. These need to be primarily visual assessment tools that will not initially require access inside the buildings. Such a visual assessment can help in developing a broad sense of the vulnerability of the physical built environment and this can then form the basis for prioritizing individual buildings for more detailed analysis based on their importance in a post-disaster scenario. The vulnerability mapping can even be undertaken as part of the Census exercise where the building materials of floors, walls and roofs are currently being identified. This Rapid Visual Survey proforma can be further detailed out and can then be used to obtain more details. Such an exercise could yield an excellent and useful database for urban vulnerability studies.

A. K. S. Parmar, Disaster Management Institute, Bhopal

The query raised pertaining to "Urban Disaster Risk Management " is currently one of the most important issue and needs strategic planning and greater deliberations to address multifarious aspect to face the emerging urban challenges ahead. I would also like to express my sincere gratitude to the Multiple Contributor Community Forum provided through dedicated efforts of Solution Exchange team to provide a platform for sharing of experiences and enhancing our knowledge to address the disaster problems more effectively.

Why Urban Disaster needs more attention:- one example

Recently NDMA has prepared and issued the guideline on flood management. However, since problems of flood in rural, semi- urban and urban areas are different, a separate committee has been constituted to address the **urban flood** problems and issue of separate guidelines.

Some of the disaster which could have serious impact in urban areas are Earthquakes, Floods, Congestion of water, Fire, Chemical and Industrial Disaster, Bomb Blast/ Anti-national or terrorist activities, Accidents (road/rail), Stampede during various religious or political events and Biological Disasters/ Epidemics etc.

Each one of these has their own importance though priorities in various regions may be different because of prevailing conditions. However loss of live and damage to property both private public remain our prime concern. It is for these reasons that NDMA has taken up the task of preparation of guidelines for management of various disasters. These are being prepared with great deliberations involving representation from all sectors, public, governmental, private, technocrats, NGO's/ voluntary organizations, disaster management professionals and other stake holders. We have to however, see how these guideline are enforced in letter and spirit.

As you are all aware, the UNFPA reports, June 2007 on the state of world population has identified that:-

The future growth of population would be maximum in the town & cities and in Asia; the urban population may double between years 2000 and 2030.

Better facilities, transportation and communication bring Cities, Villages & Agriculture form areas closer and rural areas thus start transforming into urban areas. Over 55% of India's population (against projected 80% of total world) is expected to be in urban areas.

Till now mega cities have received major attention. The bulk of urban population growth is likely to be in smaller cities and towns whose capacity for planning & implementation could be exceedingly weak.

All future master plans should have a long term and broader vision of the sustainable use of urban space taking in to account needs of all strata of society especially in view of climate changes and urban heat island affect which may cause severe flood and other disaster. Growth of new buildings (earthquake /flood resistant)for increasing population would need integrated associated infrastructures viz, water supply supply, sanitation waste disposal, storm water channels, drainages and roads etc. Frequent revision of Master Plans in many cases due to obvious reasons resulted in slums with un-planned housing without adequate provision of water and sewage services. Storm water drainage often get filled with solid waste leading to out break of diseases during flood / monsoon seasons. We have witnessed ample examples of such cases in Surat, Mumbai, Hyderabad, Kolkata, Bhopal and Bangalore etc. The technical competencies of city municipalities would need to be drastically enhanced.

We can no longer afford to witness closer of our urban centres due to flooding or other disasters. We shall have to take into consideration the scientific and technological tools for carrying out structure mitigation measures (within phases on hydrological and hydraulic components) as also adopt best

practices for effective disaster response and management. Our response should be timely and rendered with full preparedness by professionally trained terams.

Some of the aspects which need particular attention for urban disasters as discussed earlier may be as under:

1. **District Disaster Management Authority (DDMA):** These should be set up urgently under provision of Disaster Management Act, 2005 and be functionally responsible and accountable for all disaster management activities. They can form required Committees of experts, advisors, which may include City Mayor, Municipal Bodies, Development Authorities and other officials within ambit of DDMA. Entire town / city could be divided into various zones, sectors and wards.

2. **Ward System:** If any ward system functions in true spirit as per charter, there may not be cases of encroachment along / on water bodies / drainage system / nullah etc. as also construction in low lying areas against land use planning norms. Regular monitoring by involved officers will also ensure that there are no violation of master plans, municipal bye-laws and rules. Similarly, in earthquake prone areas all officers can randomly check the authenticity of the building plans. In wards, on voluntary basis, teams for various disaster functions (to address pre, during, post-disaster) may be formed for effective management. Involvement of Community Self-Help is need of the time.

3. Risk Assessment and Vulnerability Mapping of each Ward and Sector be undertaken and special attention is paid towards various requirements of settlements of poor and other vulnerable section.

4. Strict enforcement of land use planning norms, flood plain zoning, siting of residential, commercial, community centres, support and services and industrial areas be implemented.

5. Creation of District EOC, Control Rooms / Communication Centres in each zone / sector / ward for EW, rapid mobilization of teams, information dissemination, coordination and response.

6. Urgent necessity for creation and equipping of trained teams for SAR, evacuation, medical treatment, sanitation, relief camps / shelters, provisioning and distribution of relief supplies, disposal of dead and Caracas etc.

7. Development and updating of community based disaster specific plans, SOPs, directives and guidelines, resource inventories and inter agency coordination mechanism.

8. Incorporation of disaster management education in all academic, technical, professional institutions beside school and colleges. First aid training should be made mandatory for all citizens.

9. Institutionalization of risk transfer mechanism, enforcement of technological regime, conduct of mock drills needs special attention.

Some views on earthquake and bomb threat are as under:

Earthquake Construction and Retrofitting: We are all convinced about earthquake resistant / retrofitting of new and existing structures respectively. This has been also emphasized by the NDMA in their guidelines. However, one of the reasons for poor adoption and ground implementation of IS Code is that general public or the users fails to understand the technicalities of the earthquake resistant design features. There is a need to simplify BIS Codes and list essential features of construction and retrofitting in simple, easily understandable language with drawings for different type of constructions (Adobe, Masonry or RCC). This may greatly help and promote compliance. Government may also consider grant of concessions / incentives to economically weaker sections. Similarly, strict guidelines should be issued

to ensure accountability, responsibilities of builders and developers, architect and engineers. Training of masons and supervisors would greatly help.

Bomb threat/terrorist threat: Though effective prevention, mitigation and response is to be undertaken by the law enforcement Government agencies, community being the first sufferer should know basic do and don'ts and made aware of likely dangers.

- General awareness to community about explosives, hazardous chemicals and bombs, do and don'ts may be given through TV / cable, newspapers, media and organisation of workshops on the subject in the school / colleges. A documentary film should be shown in all cinema halls prior to screening of films regarding various safety measures.

- Basic of evacuation drills for safe evacuation from High Rise Building, Picture Halls, Schools, Offices, Railway Station / Airports etc. against bomb threat, fire and earthquake etc. should be disseminated and mock-drills be organised.

- All office, departments and establishments / institutions must develop their security and safety plans and carry out mock-drills.

- Thorough sanitisation and checking of personnel: This should be strictly enforced during entry to cinema halls, cultural / public shows / melas / circus, religious assembly, elections rallies and voting booths, railway stations / airports etc. Special checking by static and Mobile Quick Reaction Teams (QRTs) must be carried out during major festivals (Diwali, Id celebrations) and other important events to prevent such cases.

- Develop sense of alertness: Need for developing sense of alertness against suspicious persons, attractive items or un-usual act should be emphasised.

- Everyone should know first aid training and use of fire prevention appliances like extinguishers.

- Fire brigade personnel should also be given basic training on Bomb Detection and Disposal.

Garima Aggarwal, GoI-UNDP Disaster Risk Management Programme, New Delhi

As rightly pointed out by eminent participants, that there is a need to strengthen the institutional system and a comprehensive approach is needed to be implemented which can deal with the aspects of disaster preparedness, mitigation and response.

Delhi is exposed to various risks to earthquakes due to its soil, which is liable to liquefaction, very high population density, sub-standard habitat, disproportionate occupancy rate, poor design and construction qualities and lack of community preparedness and adequate response. Therefore it is desirable to incorporate these risks elements into the development plans and in present institutional arrangements. On the basis of my experience of working in Delhi under GoI-UNDP Disaster Risk Management Programme below are some suggestion which needs to be incorporated while developing urban areas for disaster risk reduction:-

- There is a need to strengthen institutional setup at various level of administration to ensure the management of disasters during emergencies. The responsibilities and reporting system of the various departments such as Police, Fire, Transport, Communication, NGOs, Public Work Department, Municipal Corporation and Revenue department etc should be clearly demarcated within a well-defined structure so that response time may be reduced at the time of disasters. For example- In Delhi disaster management has initiated before 4 years. Many initiatives like Constitution of Delhi Disaster Management Authority, district committees and community level

committees have been formed. Mock-drills have been organised at state, district and community level to strengthen response mechanism and coordination system. However, actual mainstreaming of Disaster management responsibilities is still under way.

- Mainstreaming of Disaster Management into development planning may be ensured by regulating land-use zonation according to the exposure of risks, Updation and enforcement of building byelaws as per the disaster resistance codes and retrofitting of life line buildings and other important buildings. Such practice may help in reducing risk by improving the condition of existing buildings and new constructions.

- There is a need of awaking generating public by fostering community based disaster management planning initiative in schools, hospitals, residential areas and villages etc. in the disaster management initiatives at grass root level so that community preparedness may be ensured .

- Geographic Information System and databases, focusing on the development of techniques and decision support tools using GIS to integrate, manipulate and display a wide range of risk-related information should be developed. Such system may also include the techniques to assess the vulnerabilities of buildings, infrastructure and people to the impact of hazard that may be helpful for the local authorities in taking decisions during emergency situation.

- Availability for quantified database at various administrative levels for various aspects is very limited, which was also faced while conducting the present study. A detailed database on disaster risk aspects should be developed so specialized studies and assessments can be facilitated at all levels of planning. It may help in exploring and expanding means of indicators and parameters which will result more relevant picture in front of us.

- There is need of conducting Hazard Risk Vulnerability analysis which may also include the techniques to assess the vulnerabilities of building, infrastructure and people to the impact of hazard. The study will be useful to the local authorities in taking decisions during emergency situations and also in identifying important/ life-line buildings to be selected for retrofitting, which can also serve as a important urban planning tool.

- To enable a better response to future disastrous events, a time bound programme may be taken up carrying out assessment and retrofitting of all lifeline buildings, in the government sector, private and business sector.

- For mitigating the impact of disasters, there is a need of building capacities of policy makers, implementers and entire construction fraternity including engineers, architects, masons, builders and town planners on promoting disaster resistant construction technology as an important urban planning tool.

Jaidev Deshpande, Vishwakrama Institute of IT, Nagpur

On handling urban disasters, e-learning could be a lot of help. Here in Pune, there are some e-solutions and e-learning companies, which are working with some NGOs and the local police to build e-learning programmes for the police and the public. These programmes are interactive, make use of various pedagogic techniques to make effective presentations based on tackling the commonest problems in traffic and accidents.

What works against traffic congestion and accidents, could also work against earthquakes, floods, and riots. The major problem during any urban disaster is to manage the panicking population. The only way

to do away with unnecessary panic is to spread awareness about calamities. If that were to be done effectively, then the cops, the firefighters, and the civil defence force could concentrate on the casualties and other important work.

The keystone in disaster management is spreading awareness. E-learning provides a more effective, interesting, and accessible means of education. As e-learning centers are becoming increasingly common, they can very well be within reach of anyone who would like to use them against the conventional rote-learning practices.

Sushil Gupta, Risk Management Solutions Internationals, Noida *(response 1)*

You have started discussions on a very important topic. Handling urban disaster is an important issue, which need an urgent attention from policy maker point of view. The urban infrastructure in cities of India is increasing at an alarming rate and so the risk related to different natural as well as man-made hazards. There is an urgent need to pay attention to such problems.

Ranjini Mukherjee, United Nations Development Programme (UNDP), New Delhi

Ministry Of Home Affairs, GOI with support from UNDP-India is implementing a project named Urban Earthquake Vulnerability Reduction Project (UEVRP) in 38 cities across the country aiming at reducing earthquake risk in urban areas. Under the project we have been working closely either with Municipal Corporations or District Administration in respective cities. Mitigating disaster risk in urban areas is definitely a complex issue and needs multiple interventions involving different actors.

The broad objectives of the project are as follows:

- Awareness Creation
- Training and Capacity building of various stakeholders which include-training and capacity building of engineers, architects and masons on hazard resistant technology, training of community people on life supporting skills like first aid, search and rescue and fire fighting and administrators and other functionaries on various aspects of disaster management.
- Preparation of Earthquake Preparedness and Response Plans.
- Facilitating the amendment of Municipal Building Rules/Development Control Regulations to ensure structural safety in natural hazard prone areas.
- Networking with various institutions, agencies and experts for knowledge building and replication of the strategies for earthquake risk reduction in newer areas.

The project aims at sustainable earthquake risk reduction. We aim to look into various aspects of disaster management encompassing preparedness, response and mitigation. Few of the project targeted cities have come up with their City Disaster Response plans like Mumbai, Surat, Guwahati, Patna, Ahmedabad. These plans are essentially response plans and by and large spell out the response mechanism to be followed during emergencies like earthquake, fire and flood at the administrative level. These city plans are supported by the Disaster Response and Preparedness Plans prepared at community level. We have identified wards as the unit for community level planning, but at places we have even considered the zones.

Often big cities are divided into zones and each zone comprises of 10-15 wards. We are at present in the process of preparing community level plans. The City and the ward level DM plans will be further supported by Disaster Management Teams constituted at ward level and trained in first aid, search and rescue, firefighting, water and sanitation, management etc. At present we are aiming to develop preparedness and response plans and are not focusing on mitigation measures. Every city has also constituted a Disaster Management Committee involving various stakeholders. However the functioning of these committees depends to a large extent upon the efficiency of the governance system existing in

respective city or district. Hereby I am sending you the few links which you may visit to know more about the plans.

- http://mdmu.maharashtra.gov.in/pages/Mumbai/mumbaiplanShow.php
- http://www.suratmunicipal.org/content/downloads/citydevelopmentplan/main.shtml
- Process Document-Ward level Planning: http://www.egovamc.com/UEVRP/13WDMP/Ward_Disaster_Management_Plan.pdf (Size: 126 KB)
- Ahmedabad City Disaster Management Plan (However this document is in Gujarat) http://www.egovamc.com/UEVRP/9MDRP/9.asp
- Disaster Management Plan, N.E. District, Delhi: http://data.undp.org.in/dmweb/plans/DDMP_ND_VOL1_VERSION1_0.pdf (Size: 1.15 MB)

I also want to recommend a working paper on Standard Operating procedures of Urban Disaster Management in Municipality of Bandung, Indonesia for your reference. To read paper click: http://www.solutionexchange-un.net.in/drm/cr/res18100701.pdf (Size: 358 KB)

One of the most important risk reduction measures that we aim to facilitate under the project is revision/ amendment of the Building Byelaws/Municipal Building Rules. Ministry Of Home Affairs had come up with a model guideline proposing the amendments to be brought into Building Rules, Development Control Regulations,Landuse zoning regulations and Town and Country Planning Act to ensure structural safety in natural hazard prone areas. Under UEVRP, we are facilitating each corporation to review their existing byelaws and bring in the necessary amendments as required.

Other mitigation measures we are targeting at is building the capacity of engineers, architects and masons on hazard resistant technology Such training will help in ensuring construction of safe buildings. In addition to this sensitisation programmes are being held under the project for builders, promoters and construction agencies to create awareness on earthquake/hazard resistant technology and its applications.

To know more about UEVRP you may visit www.ndmindia.nic.in/http://www.undp.org.in/dmweb

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Manish Yaduvanshi, United Nations Development Programme (UNDP), Meerut

The mechanisms and processes of disaster risk reduction in urban areas vary from place to place and depend on the social structure/setup of the urban body. Since the population profile of cities is highly varied, so must be the approach adopted to reach out to them. The various volunteer based organizations like Civil Defence (working with local administration on issues related to law and order or supporting during an emergency), National Cadet Corps (based in schools to develop leadership qualities), National Service Schemes (based in Colleges and taking up social issues) and Nehru Yuva Kendra (to involve youth in nation building activities) have been involved to promote disaster management activities in the cities. These organisations having a large setup of well trained volunteers at all levels have become agents of change and helped to enhance disaster risk reduction efforts in urban areas. While NYKS and NCC volunteers are helping in awareness generation, volunteers from Civil Defence and NSS are helping in planning and capacity building exercises.

Toms K. Thomas, Disaster Management Unit, Evangelical Social Action Forum (ESAF), Trichur

Disasters became a part of life of both urban and rural localities and those localities that are poor and marginalized become more vulnerable at times of a disaster. More over disasters affect the local economy and the over all development of any country. Effective mitigation and preparedness policies and programs could potentially reduce the vulnerability as well as the economic deprivation.

Mechanisms and processes that can be developed to enable disaster risk reduction in urban areas.

- Identifying stake holders in the potential disaster risk reduction.
- Developing various community based groups that could be accessed in case of a disaster.
- Identifying various volunteers that are already active
  - Nehru Yuva Kendra
  - Political Parties
  - Business Establishments
  - NCC/ NSS / Scouts/ Guides etc
  - Church / other religious groups
  - Police / Army / Reserve police
  - RPF
  - School children and teachers
- Developing appropriate curriculums for capacity building of these groups
- Could be also advisable to have a cadre of disaster response team like a railway protection force to have a readily available team in case of any disasters.
- Setting up of various recovery and rehab mechanisms
- Identifying local institutions and organizations that could be used for temporary shelters
- Housing and other policy formulation at the municipality and the state level
- Developing emergency medical aid teams at the district level and building their capacities.

Examples of standard operating procedures followed by different agencies while dealing with urban disasters.

It is advisable to have a lead organization developed at the district level that would coordinate developing of the various disaster preparedness teams and the capacity building efforts. The lead organization should be voluntary organization which should work in close association with various government departments.

Sushil Gupta , Risk Management Solutions Internationals, Noida *(response 2)*

Ms. Garima has tried to explain at length various issues related to Delhi Disaster Management. I would like to put more emphasis on the following part of her mail:

"*There is need of conducting Hazard Risk Vulnerability analysis which may also include the techniques to assess the vulnerabilities of building, infrastructure and people to the impact of hazard. The study will be useful to the local authorities in taking decisions during emergency situations and also in identifying important/ life-line buildings to be selected for retrofitting, which can also serve as a important urban planning tool".*

For Delhi, first level of Seismic Microzonation has already been conducted by specialist organisations such as Department of Earthquake Engineering, Indian Institute of Technology Roorkee, Indian Meteorological Department, Geological Survey of India etc. and entire Delhi area has been divided into hazard zone of low, medium and high. Here I would like to mention that whole Delhi is not Liquifaction prone, so damage level will be different in different region due to the impact of an impending earthquake hazard. So what should be the next step?

The next step could be the study of exposure - Lifelines, residential and commercial buildings as future constructions can be made seismic code compliant, but what should be done with the entire existing built-up. So, logically next step should be the Vulnerability assessment of different types of buildings present in Delhi NCT. Once these two steps are complete, the damage and Risk assessment can be done, which can not only help in estimation of losses in future earthquakes but also in estimation of

requirement to level of Seismic-retrofit in different types of buildings, which will minimises the seismic risk. For estimation of life loss in different earthquakes will also depends on the time of occurrence of earthquake. So, one can know before a disaster stikes, how much would be damage level, approx. no. of loss of lives, trapped, injured requiring hospitalisation, subsistence requirements (food, shelter, energy, etc.). Thus, the study will help Government Authorities (Ministers, Administrators, Planners etc.), in knowing, the hot-spots, which need immediate relief and rescue measures in the occurrence of a disaster strikes Delhi. Thus, the resources can also be planned optimally in the occurrence of an earthquake disaster. Also, by inputting the Shake map to the model in real-time, the estimates of all the parameters can be made and relief and rescue measures can be planned optimally in a very short -time, which can save lot of lives within the Golden hours.

We, at Risk Management Solutions Internationals (RMSI) have performed such studies in different parts of the world. Here, I would like to emphasize here that such study is an urgent need of hours keeping in mind the huge infrastructure of Delhi, the National Capital of the Country.

Sudhir Kumar, United Nations Development Programme (UNDP), Mumbai

On Urban Disaster Management, I would like to add a few points:

1. The issue of *single command* is very important in cities as multiple response agencies are involved. For example in Mumbai, the key agencies are Municipal Corporation of Greater Mumbai, Police (law & order), Traffic police, MMRDA, Fire brigade, Railways (Western & Central), etc and coordination has been a key issue is past. In light of the same, as per the Disaster Management Act, 2005, a sub-committee of the Maharashtra State Disaster Management Authority has been constituted under the Chairmanship of Addl. Chief Secretary (Home), Municipal Commissioner, MCGM is its vice-chairman and members are drawn from all line agencies. The ACS (Home) being one of the senior most bureaucrat in the State and also head of Police, Traffic Police, etc helps in ensuring better coordination.
2. Decentralized positioning of Search & rescue team: Many a times during disaster, the traffic goes for a toss due to several reasons and flood of 2005 in Mumbai is such an event. Approximately 33,000 vehicles had to be shifted from roads. The SAR team have to positioned at different regions so that access is easy.
3. Culture of risk transfer and insurance: Though it is at very nascent stage in terms of disasters management, but it has to be given serious consideration. Willis Group is devising an instrument in which claim is linked to the Richer Scale of course it needs to be further refined and customised.
4. State-of-the art response centres: In Gujarat Emergency Response Centre is being underway . Also in Maharashtra Regional Disaster Response Centre is being set-up and strengthened. These Centres will help in creating effective response and build capacity of urban population.
5. Professional Engineers' Bill/Act: The current building bye-laws and DCRs are robust enough to take care of earthquake resistant constructions in most cases. Also modern building byelwas have been prepared. Key is enforcement and one of the reason for low enforcement is inadequate capability of Municipality of Corporation. The Professional Engineers Bill envisages peer review of structural drawings, completion report, etc. It also envisages fixing responsibilities. Some of the States have either prepared or passed this Bill and it includes Gujarat, Maharashtra, etc.

Prabhakar Sharma, Government of Karnataka, Mangalore

Apologies for the delayed response.

As mentioned by many eminent persons in this community, earthquakes are one of the most devastating of the natural disasters effecting human welfare, economic activities, property and natural resources as

approximately 59% of India's landmass is prone to earthquakes. As mentioned in the Guidelines issued by the NDMA on Management of Earthquakes and the EM-DAT, CRED database, more than 23, 000 lives were lost during the period, 1990-2006 due to the 6 major earthquakes alone.

Taking this into consideration, the GoI-UNDP have been implementing the Urban Earthquake Vulnerability Reduction Project, a sub-component of the GoI-UNDP Disaster Risk Management Programme. This project is being implemented in Mangalore, Dakshina Kannada and one of the sub-components of the project is the strengthening of the administrative governance structures related to earthquake risk. It tries to address some of the questions related to earthquake risk management by answering certain questions and finding solutions through local means which also includes capacity enhancement of local government officials, engineers and architects, builders, developers and the lay community.

One of this being the reviewing and revising of the building byelaws according to the guidelines issued by the Committee of Experts (2004), Government of India on building byelaws. We did take up this initiative under the aegis of the Urban Earthquake Vulnerability Reduction Project in association with all stakeholders including local academic institutions and a Technical Committee Report was perpared (November 2006). After a marathon two year effort in advocacy, we succeeded in convincing the Municipal Corporation of Mangalore to accept and notify the revised building byelaws which have been put up to all the stakeholders of Mangalore City for comments. On reciept of constructive comments and revision accordingly, if required, the new building byelaws for Mangalore City would come into froce 90 days from the date of publication.

It is available at www.mangalorecity.gov.in and the url for the doucment is
http://www.mangalorecity.gov.in/forms/Mangalore%20City%20Building%20Byelaws%202007.pdf

The salient features are outlined in an article written by the Chairperson of the Technical Committee and carried by the Asian Disaster Preparedness Centre Newsletter for May-August 2007 titled, Emerging Risks and Approaches for Reducing Vulnerability of Urban Built Environment. The article is available at page 22 in the newsletter which is available at
http://www.adpc.net/v2007/IKM/ONLINE%20DOCUMENTS/downloads/2007/Sep/Newsletter_May-Aug.pdf

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Many thanks to all who contributed to this query!

If you have further information to share on this topic, please send it to Solution Exchange for the Disaster Management Community in India at se-drm@solutionexchange-un.net.in with the subject heading "Re: [se-drm] Query: Handling Urban Disasters - Experiences. Additional Reply."

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