

## DISASTER MITIGATION

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### ABSTRACT

Disasters have resulted in significantly morbidity, morality and economic loss. It is virtually impossible to prevent occurrence of most natural disasters but it is possible to minimize or mitigate their damage effects. Mitigation measures aim to reduce the vulnerability of the systems (e.g. by improving the building codes etc.). Disaster prevention implies complete elimination of damages from hazard, but it is not realistic in most hazards (e.g. Relocating a population from a flood plain). Through study of the past disasters, their effects and their relief efforts [what has been effective and what have been mismanaged] better plans are now available for effective disaster management and mitigation as well as for the reduction of preventable losses. The objectives are likely to include awareness and education to people on the nature of natural hazards and the encouragement for people to protect themselves as far as possible. The paper discusses about the various mitigation preparations to avoid the maximum damages and to create awareness and knowledge among people in respect to the mitigation strategies developed and adopted at the time of crisis.

**Keywords:** Disaster mitigation, Natural & Man-made Disaster, Mitigation, Mitigation Methodologies.

### I.INTRODUCTION

According to Disaster Management Act 2005, disaster means, “a catastrophe, mishap, calamity, or grave occurrence in any area, arising from natural or man-made causes, or by accident or negligence which results in substantial loss of life or human suffering or damage to and destruction of property, or damage to, or degradation of, environment, and is of such a nature or magnitude as to be beyond the coping capacity of the community of the affected area”.

In simple words, “disaster is a quick action of a catastrophic event bringing great devastation to society or environment”.

India has been traditionally vulnerable to natural disasters on account of its unique geo-climatic conditions. Floods, droughts, cyclones, earthquakes and landslides have been recurrent phenomena. Statistics say that, about 60% of the landmass is prone to earthquakes of various intensities; over 40 million hectares is prone to floods; about 8% of the total area is prone to cyclones and 68% of the area is susceptible to drought. The Yokohama message emanating from the International Decade for Natural Disaster Reduction in May, 1994 underlined the need for an emphatic shift in the strategy for disaster mitigation. It was inter-alia stressed that disaster

prevention, mitigation; preparedness and relief are four elements which contribute to and gain from the implementation of the sustainable development policies. Government, NGO's, private public sectors & Educational & Research institutes should work hand in hand to plan definite policy for housing before disaster, after disaster and during disaster.

## **II.NATURAL DISASTER**

A natural disaster is a result when a natural event disrupts normal activities of humans and/or the built environment. Lack of appropriate emergency management leads to financial, environmental or human loss in the affected areas. Natural hazards hit the areas of vulnerability and vulnerability is the likelihood of the area to make disaster happen.

- Earthquake
- Floods
- Landslides
- Tornado
- Cyclonic storms
- Tsunami's
- Wild Fire hazard
- Wind
- Avalanche



**Fig.1: "Natural Disaster"**

## 2.1 MAN-MADE DISASTERS

Airplane crashes, terrorist attacks, riots, are examples of man-made disasters: they cause pollution, kill people, and damage property.



Fig.2: “Man-made Disaster”

## 2.2 MITIGATION

Mitigation simply means to minimize the ill-effects of the hazard likely to be happen in the prone area i.e. it complements the disaster preparedness and disaster response activities. Mitigation measures can be structural or non-structural. Structural measures use technological solutions like flood levees. Non-structural measures include legislation, land-use planning (e.g. the designation of non-essential land like parks to be used as flood zones), and insurance.

Mitigation is the most cost-efficient method for reducing the effect of hazards although not always the most suitable. Mitigation includes providing regulations regarding evacuation, sanctions against those who refuse to obey the regulations (such as mandatory evacuations), and communication of risks to the public. Some structural mitigation measures may harm the ecosystem.

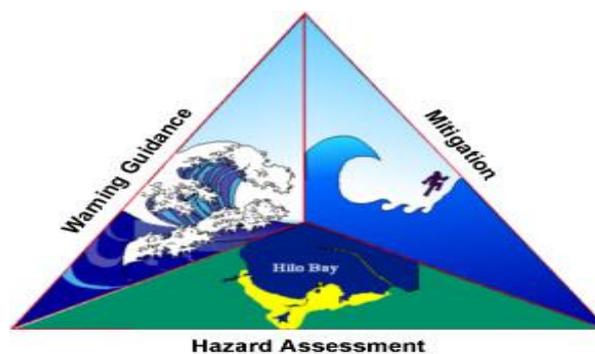


Fig.3: “Hazard Triangle”

### 2.3 DISASTER MITIGATION

Disaster mitigation is any action taken to eliminate or minimize the impact of a disaster on people, property and the environment. Or Disaster mitigation measures are those that eliminate or reduce the impacts and risks of hazards through proactive measures taken before an emergency or disaster occurs.

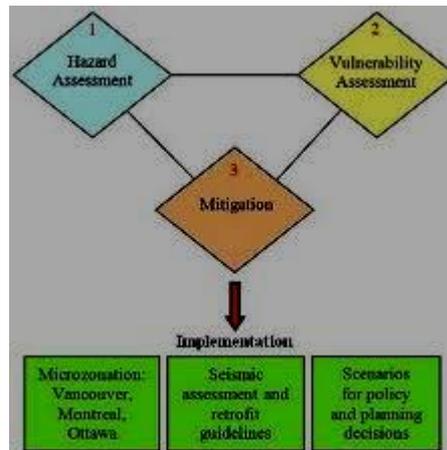


Fig.4: Disaster Mitigation

### III. TYPES OF DISASTER MITIGATION

Disaster mitigation measures may be structural (e.g. flood dikes) or non-structural (e.g. land uses zoning). Mitigation activities should incorporate the measurement and assessment of the evolving risk environment. Activities may include the creation of comprehensive, pro-active tools that help decide where to focus funding and efforts in risk reduction.

Other examples of mitigation measures include:

- Hazard mapping
- Adoption and enforcement of land use and zoning practices
- Implementing and enforcing building codes
- Flood plain mapping
- Reinforced tornado safe rooms
- Burying of electrical cables to prevent ice build-up
- Raising of homes in flood-prone areas
- Disaster mitigation public awareness programs
- Insurance program

## **NATURAL DISASTER MITIGATION METHODOLOGIES**

### **3.1 Earthquake Mitigation**

- Check for hazards in the home
- Identify safe places in each room
- Locate safe places outdoors
- Ensure all family members know how to respond after an earthquake
- Teach children
- Develop an emergency communications plan in case of separation during the earthquake

### **3.2 Landslide Mitigation**

- Get a ground assessment of your property
- Minimize home hazards (plant ground cover on slopes, build retaining walls, and in mudflow areas, build channels or deflection walls to direct flow around buildings)
- Make evacuation plans, planning at least two routes allowing for blocked and closed roads
- Develop an emergency communication plan and ask an out-of-state relative or friend to serve as the family contact
- Purchase flood insurance.

### **3.3 Flood Mitigation**

- Working with your local planning office, use Global Positioning Systems (GPS) to map the longitude and latitude of structures at risk from flooding. Alert residents and provide information about how they can mitigate.
- To increase public awareness of flood hazards in the community, post markers showing the Base Flood Elevation.
- Post signs showing height of past flooding events. Provide information about how people can prevent damage in a similar event.
- Remove all debris from culverts, streams, and channels to allow the free flow of potential floodwater.
- Clean storm drains and gutters, and remove debris from residential properties to allow free flow of potential floodwater.
- Build or provide platforms for residents to raise their appliances.
- Construct a rain garden to help minimize flooding.
- Rehabilitate abandoned lots into gardens that provide drainage.
- Plant vegetation in areas that are at risk for mudslides/landslides.

- Perform stream restoration activities.
- Help a licensed plumber distribute and install backflow valves.

### **3.4 Wildfire Mitigation**

- Conduct a wildfire risk assessment.
- Install smoke alarms.
- Distribute smoke alarm batteries and/or reminders to change batteries or check alarms.
- Move shrubs and other landscaping away from the sides of homes, public buildings, businesses – replace with plants that resist or retard fires, where possible.
- Clear dead brush and grass from properties so that it will not be there to fuel a spreading fire.
- Assist licensed professionals in removing trees near homes

### **3.5 Wind mitigation**

- Work with a local arborist to identify species of trees that are more resistant to high winds. Help promote the use of these trees.
- Check and repair security devices, such as window and door locks, and other light maintenance work.
- Secure or remove items that could become projectiles in high winds.
- Conduct minor repairs to the homes of the elderly.
- Install and/or secure storm shutters.
- Distribute and/or install hurricane clips and straps.
- Strengthen windows and doors.
- Build a demonstration safe room.
- Assist licensed professionals in removing trees near homes.

### **3.6 Disaster Mitigation Guidelines for Any Hazard**

- Identify and publicize natural hazard risks in the community.
- Distribute disaster mitigation information packages to residents and businesses.
- Identify and disseminate information about easy, cost effective ways that home and business owners can protect themselves against potential dangers on their properties and in their neighborhoods.
- Help the elderly and/or physically challenged to prepare personal disaster plans.
- Survey area with emergency management officials to identify risks and ways to mitigate against them.
- Create a tool lending library with tools and how-to guides necessary to perform simple, appropriate mitigation activities.

- Research and create a map of elderly, home bound, disabled and less accessible rural citizens who need to be relocated during a disaster.
- Present “Masters of Disaster” modules to younger students.
- Hold classes to educate residents about steps they can take to minimize their risks.
- Retrofit childcare centers, nursing homes or other important facilities for multiple or most threatening hazards

#### IV.CONCLUSIONS

Like its been already said that it is impossible to stop the occurrence of mishaps lead by disasters but reducing its ill effects is surely in our hands. By conducting micro-zonation surveys of large urban areas falling in the disaster prone regions and preparing appropriate preparedness and mitigation plans on an urgent basis, can reduce the effects. In order to achieve this goal there is a need of public and private bodies to give a thought for this evil of society because as they say “when there is a will there is a way”. So to prevent and protect from these natural and manmade disasters and give solutions at root level cause “Planning evaluation & Management” has more importance.



Fig.5:Disaster Management & Mitigation

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