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Disaster Management during Flood Time

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Abstract

Disaster Management can be described as the organization and management of resources and responsibilities for typically dealing with all humanitarian aspects of emergencies, in particular preparedness, response and recovery in order to lessen the impact of disasters. This work incorporates the policies implemented by developing countries India for the disaster management.

Keywords: *Disaster Management, Policies, Developing countries, Resources*

INTRODUCTION

Flood has been considered as one of the very most recurring and frequent disaster in the world. Due to recurrent prevalence, the economic loss and life damage caused by the flood has put more burdens on economy than any other natural disaster. India has continuously suffered by many flood events which claimed collosal loss of life and economy. It has been found that the incidences of the flood are increasing very sporadically. Causes can be climate change, cloud bursting, tsunami or poor river management, silting etc. but devastation is increasing both in terms of lives and economies.

Flood is most profound and costliest natural disaster in the world which devastates both life and economy at a large extent. It is defined as, "High-water stages in which water over flows its natural or artificial banks onto normally dry land, such as a river inundating its floodplain." This local and short term event comes with little or no alarming. When the hazards,

imposed by flood, exceed the coping capabilities of the affected population it become ahge disaster. Centre for Research on the Epidemiology of Disasters (CRED), a research unit of the Université catholique de Louvain (UCL) situated at the School of Public Health of the Brussels campus of the university, Belgium, defines a disaster as "a situation or case [which] overwhelms local capacity, necessitating a request to a national or international level for external assistance; an unforeseen and often sudden event that causes great damage, destruction and human suffering (Nandy, 2005)."

For a disaster to be entered into the official database (Fig: 1), at least one of the following criteria must be fulfilled:

1. Ten or more people reported killed
2. 100 people or more has to be reported as affected
3. Declaration of a state of emergency
4. Call for international assistance.

The number of people killed includes people confirmed as dead and people missing and much presumed dead. People affected are those requiring immediate assistance during a period of emergency (i.e., requiring basic survival needs such as food, water, shelter, sanitation and immediate medical assistance). People reported injured or homeless are assessed with those reported affected to produce a total number of people affected". The economic impact of a disaster usually consists of direct consequences on the local economy (e.g., damage to infrastructure, crops, housing) and indirect consequences (e.g., loss of revenues, unemployment, and market destabilization). In EM-DAT, the registered figure corresponds to the damage value at the moment of the event and generally only to the direct damage, expressed in US dollars (2012 prices).

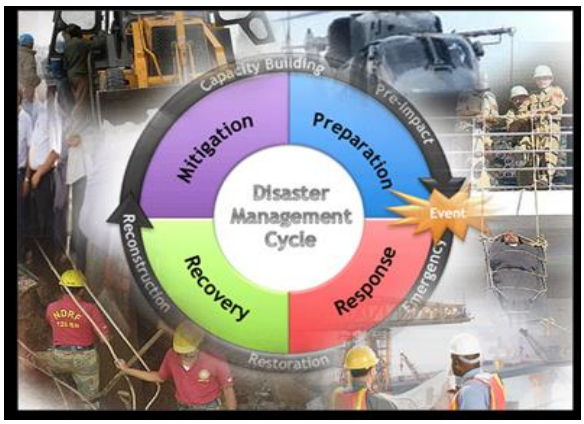

Fig: 1 Disaster management

DECADE OF FLOODS – REPORT

1993 – The monsoon followed particularly haras summar, when the mercury touched 48 degrees in some parts of central India, while other regions suffered incessant heat waves. But once the rains came, they refused to stop. The trickle soon turned into acollosal torrent, and a vast region-stretching from Kashmir in the north-west to Arunachal Pradesh in the north-east – came under water. The loss in human lives was high and the damage to property ran into 2.1billions of dollars. Punjab witnessed its worst floods in over 45 years, and so did Haryana, eastern Rajasthan and Himachal Pradesh. Even Jammu and Kashmir, one of the least flood-prone states, had large areas submerged under several feet of water. Even in those states where the floods are so much a recurring phenomenon – Delhi, Gujarat, Arunachal Pradesh and Meghalaya – the people were completely caught unaware. Town planning is based on certain probabilities. If the flood level is higher or the rainfall is much heavier than what is anticipated, it may be difficult to protect the town (Messner,2007). As far as flood management is concerned, no town is planned on an area which is not much drained. Towns are always located on places that are well protected. Also, towns must have access to water resources. But if a town is close to its water source which, at the same time, is its drainage basin, it becomes flood-prone. 1994 – Another year of major floods in India. More than 148 people died in Kerala since the onset of monsoon that year. The flood related dextrose to 139 in Gujarat. According to rough estimate 100,000 marooned in Madhya Pradesh. Other places like Bihar, Orissa and Uttar Pradesh experienced flashfloods. About 60-65 persons were feared killed in two cloud burst in Shaat village of Kullu district and Khariana in Dharmashala area of Kangra district in Himachal Pradesh. The loss due to follds in Karanataka that year had been estimated at 17.6millon dollar. The most affected had been the Dakshina Kananda district where loss to private and public property was estimated at 80 million dollars. 1995 – In Uttar Pradesh, Harayana and Arunachal Pradesh more than 215 people died in flash flood that year. In Himachal Pradesh increment rain led to house – collapses and landslides. Seven people killed in Shimla in separate incidents. Haryana the worst hit areas were Rohtak, Bhimani, Hissar, Jind and Rewari. Major rivers like Ganges and Jamuna continued to be in state and flowed above danger level. West Bengal and Sikkim also experienced the flood that year. 1996 – Major floods throughout the country paralysed life, killed people and

animals. More than 58 people died in Rajasthan and 150 villages manrooned. The 300 km Jammu & Kashmir National highway was closed for more than 12 days cutting it with rest of the world. The death toll in that years flood in southern Andhra Pradesh went upto 137 with another 149 missing. The floods were caused due to the breaching of a number of medium and minor 3irrigation sources following heavy down pour of couple of days. Massive crop damaged in Andhra Pradesh that year. 1997 – One hundred and thirty-five people were dead in a devastating cloudburst which washed away a large part of the village of Chirgaon about 120 km from Shimla in Himachal Pradesh. Rescue teams which had a difficult time in reaching the site recovered 34 dead bodies. The administration in our towns neglects the essential services, especially the drainage system. Most towns do not have drains because they have not been provided in the planning stage. However, in many cases, even the existing drains do not serve the purpose, because they have been allowed to degenerate. The municipalities do not pay adequate attention to these essential services. Floods have caused havoc because of inadequate town planning. The drainage systems have not been able to withstand the unprecedented rains this year. Above all, basic infrastructure, such as water supply, solid waste disposal and drainage, has been given the last priority. This has nothing to do with planning. There is water logging een in places where proper planning has taken place. Therefore, it is not only because of design, but also poor management that has led to a great deal of suffering (Komori et al., 2012).

Two successive floods in 1987 and 1988 had such an effect on the animal population that it is yet to recede and assessed. The hog deer population of Kaziranga prior to those years hovered around 11,000. Now, even after protacted recuperation, the numbers are down to the 6,000 mark. As the water goes down in Kaziranga, the stench of rotting flesh will rise. But even then we will onlygt a preliminary report on the damage. Nature takes its toll. It also takes it time. 1999 – Capital New Delhi was hit severely in that years flood. The most affected colonies were in north-east, east and north-west Delhi where accumulated rain left people wading out of knee-deep water. Delhi is water-logged only in pockets. That is because the drainage system 4is not maintained properly. Moreover, the areas, which were to be kept under the green belt, have been encroached upon or taken up for development. The drainage basin of the

city has been caten away by unauthorised construction.

Devastating Floods Affect Millions In India 2005

Operation Blessing teams are responding with emergency disaster relief after heavy monsoon rains prompted severe flooding in western India. More than 1,100 people have already perished after weeks of incessant rainfall (Jonkman et al., 2005). The city of Mumbai, formerly known as Bombay, was deluged with 38 inches of rain in 24 hours -- the most any Indian city has ever received in one day. Officials estimate 25 million people have been impacted by the widespread flooding. OBI relief workers navigated treacherous roads to reach the hardest hit areas in the state of Gujarat, where up to 10,000 different villages have been inundated by floodwaters.

Food distribution efforts began immediately, and OBI medical teams soon arrived to care for the sick and injured. More than 6,500 flood victims have received meals from Operation Blessing, while OBI doctors have treated 9,880 people in need. OBI relief efforts are also underway in Uttar Pradesh and Yavatmal, Maharastra, where more than 3,000 people have received medical care and 360 families were given temporary housing materials. Additionally, Operation Blessing is supplying community assistance through providing temporary shelters, burying animals and other debris removal and distributing supplies at one local prison that was impacted by the flooding.

Flood Prevention, Preparedness and Mitigation. Floods being the most common natural disaster, people have, out of experience, devised many ways of coping with them. Encroachments into the flood plains over the years has aggravated the flood problem and a need to take effective and sustained FM measures has been felt. Various measures, structural and non-structural, have been taken by the central and state governments and as a result, considerable protection has been garnered to the people.

However, more efforts are required in this direction and there is a need to put in place a techno-legal regime to make structures flood-proof and regulate the activities in the flood plains of the rivers. Flood forecasting and warning and Decision Support System (DSS) will be established on a scientific basis taking into account the latest technological developments in the world.

Capacity Development and Flood Response

The central government and the state governments are much required to take steps for capacity development for taking effective and sustainable preventive, preparatory and mitigative measures in pre-floods stage and effective and prompt response during- and post-floods stages. Strategic and appropriate recommendations have been made in this regard. Activities for Minimising Flood Risk and Losses. The activities proposed to be under taken aim at minimising the flood risk and losses and are to be implemented in three phases in addition to recurring activities (Jonkman et al.,2009).

PHASE-I

These activities must include identification and marking of flood prone areas on maps, preparation of close contour and flood vulnerability maps, formulating plans for expansion and modernisation of flood forecasting and warning systems, identification of priority flood protection and drainage improvement works, identification of reservoirs for review and modification of operation manuals and rule curves and undertaking special studies on problems of river erosion (Jonkman et al.,2005). These will be started immediately and efforts will be made to complete them in a phased manner with the last of these activities scheduled for completion by January 2010.

PHASE-II

These include implementation of the schemes for expansion and modernisation of the flood forecasting and warning net work, execution of flood protection and drainage improvement schemes, modification and adoption of typically revised reservoir operation manuals, enactment and enforcement of flood plain zoning regulations and planning and preparation of Detailed Project Reports (DPRs) for storage reservoirs and implementation of the strategic schemes for real-time collection of hydro meteorological data on rivers in Nepal, Bhutan and China. These activities, which aim at implementation of FMPs, will commence immediately after the completion of the link activities of Phase-I and will be completed by March 2012

PHASE-III

Implementation of activities, which include construction of dams and catchment area treatment (CAT) works in India as well as neighbouring countries, is likely to take considerable time as they entail major environmental, social, inter-state and international implications. These

need careful research and interaction with the stakeholders. It is envisaged that all feasible schemes will be completed by the year 2025.

RECURRING ACTIVITIES

These activities which include inspection of dams, embankments and other structural measures, execution of restoration and strengthening works and expansion and modernisation of flood forecasting and warning systems, are to be taken on a regular basis for ensuring the effectiveness and sustainability of various measures for minimising flood risk. The relevance and status of various activities will be continuously monitored and reviewed. The activities will be modified, if felt necessary. The preparedness of the central ministries and departments concerned and the state governments will be reviewed in April/May every year and appropriate corrective measures will be taken before the commencement of the monsoon. A Post-monsoon review will be held every year in November/December so as to finalise the action(Iby,2010).

Flood Management Plans

It is expected that based on these guidelines the central ministries and departments concerned and the state governments will prepare their FMPs which will be holistic, participatory, inclusive, eco-friendly and gender-sensitive in nature and the implementation of which will result in a flood- resilient India. The plans will focus on the community and the collective efforts of the government and NGOs. Important Milestones in the Road-map for the Implementation of the Guidelines

Phase – I (Works to Commence Immediately)

- Mechanism for joint formulation of forecasts by the CWC/IMD/NRSA/states-May 2008.

- Identification of flood prone areas (villages/blocks/tehsils/districts) and marking on national, state and district level maps by the Central Water Commission (CWC)/ Ganga Flood Control Commission (GFCC)/Brahmaputra Board and the state governments in strategic collaboration with the National Remote Sensing Agency (NRSA) and Survey of India (SOI) - June 2008.

- Finalisation of plans for expansion and modernisation of flood forecasting and typical warning systems and development of DSS for management of floods by the CWC, India

Meteorological Department (IMD) and the state governments - June 2008.

Disaster Management in India

During the British era and post-Independence years, disaster management was largely limited to post-disaster relief works, food-for-work programmes etc., under a Central Relief Commissioner who headed the State Relief Commissioners. A disaster management cell was formed up in the 1990s following the declaration of the International Decade for Natural Disaster Reduction by the United Nations. This was later moved to the Ministry of Home Affairs. The National Disaster Management Authority (NDMA) is currently the nodal government agency dealing with disaster management in India. It was created by the Government of India by enacting the Disaster Management Act on 23 December 2005. It is headed by the Prime Minister and oversees the State Disaster Management Authorities (SDMAs) headed by the respective Chief Ministers. The National Institute of Disaster Management (NIDM) for capacity building and National Disaster Response Force (NDRF) for response were also set up subsequently. The primary aim of the NDMA is to lead and implement a holistic and integrated approach to disaster management. Following the setting up of the NDMA, measures for the prevention and mitigation were formulated for the major disasters. The following paragraphs focus on cyclones and floods (Haas et al., 1977).

CYCLONES

The almost 8000 km-long Indian coastline is exposed to about 10% -12% of the world's tropical cyclones. Of these, the majority originates over the Bay of Bengal and strike the east coast. The cyclones bring heavy rains and storm surges into the coastal regions. The major destructive force, however, is the wind that accompanies the cyclone. It causes huge damage. States affected by tropical cyclones in India are Gujarat, AP, Karnataka, Kerala, Maharashtra, Odisha and Tamil Nadu. Mitigation Project was launched by the Ministry of Home Affairs (MHA) covering Odisha and AP to upgrade cyclone forecasting, to track cyclones and provide warning systems. The project also aimed to build capacity and construct cyclone shelters and embankments. The total cost of the project was Rs. 1496.72crores with 80% assistance from the World Bank and the rest from the two states. The India Meteorological Department (IMD) is the nodal agency for early warning of cyclones.

FLOODS

India experiences flood havoc every year due to natural and manmade causes. The total flood affected area is 456.40 lakh ha and an average of 72.76lakh ha is affected annually. Apart from flooding of river banks during monsoon rains and cloudbursts, the urban cities in the country are increasingly witnessing flooding events leading to huge losses. The Central Water Commission (CWC) is the nodal agency for flood forecasting and warning. On average, 6000 forecasts are issued during monsoon every year (Dat,2015).

REASONS FOR CASES OF BUILDING COLLAPSE:

The need to construct buildings with structural integrity has been well acknowledged across the world. Structural integrity has been defined by Dr Steve Roberts (University of Oxford) as the science and technology of the margin between safety and disaster. Structural integrity is the ability of a structure or a element to withstand a designed service load, resisting structural failure due to fracture, deformation, or fatigue. Structural integrity is a concept often used in engineering, to produce items (including construction of buildings) that will not only function adequately for their designed purposes, but also to function for a desired service life. Structural failures in case of buildings can occur for a variety of reasons. Most of the structural failures can be typically traced to one or more of the five main causes.

- The first, whether due to size, shape, or the choice of material, is that the structure is not strong and tough enough to support the load. If the structure or component is not strong enough, catastrophic failure can occur when the over stressed construction reaches a critical stress level (Chowdhury et al., 1993).

- The second is instability, whether due to geometry, design or material choice, causing the structure to fail from fatigue or corrosion.

- The third type of failure is caused by manufacturing errors. This may be due to improper selection of materials, incorrect sizing, improper heat treating, failing to adhere to the design, or shoddy workmanship. These types of failure can occur at any time, and are commonly unpredictable.

- The fourth is also unpredictable, from the avail of defective materials. The material may have been improperly

manufactured, or may have been damaged from prior use.

- The fifth cause of failure is from lack of consideration of unexpected problems. Vandalism, sabotage, and natural disasters can overstress a structure to the point of failure. Improper training of those who use and maintain the construction can also overstress it, leading to potential failures.

As it gradually emerged through the media reports, the causes of this particular building collapse too turned out to be the familiar ones, which could be summarised as under :-Non adherence to relevant regulations and stipulated safety norms. It was an illegal construction. The building was constructed in very much short time period. Use of poor quality of construction materials for larger profit margins by the builders or Construction by unskilled or improperly trained personnel (Bern et al., 1993).

Poor families oblivious of the hazard were housed in the building while it was still under construction. Unfortunately the events like the Thane building collapse are a regular phenomenon in sporadic urbanizing cities of India. Such accidents often involve buildings in low-income, semi-formal and informal housing sectors. There are indeed gaps in the system that lead to poor construction which need to be addressed at various levels. Most of the illegally constructed buildings are, more often than not, likely to be substandard and dangerous. The buildings which are constructed without professional engineering protocols and usually with untrained construction workers are most vulnerable. Given India's current urbanization and the rising cost of land and tiny plots available for shelter, households are left with only one option: going vertical. All single storey homes are much expanding and adding vertical load and densities (Guha-Sapir et al., 2014). A five floor structure in urban areas made with zero engineering inputs will not be an anomaly. The alarming and sporadic rise in illegal construction and resultant building collapse incidences can essentially be attributed to the lack of affordable housing in general. There is need for greater focus for providing cheap and safe housing particularly to the poor, living in urban and semi urban environment. Construction of safe buildings should form the core of our efforts towards urban disaster risk reduction. It is heartening to note that the Central Government as well as several

state governments are consistently focused on this important issue. It is imperative that each of such accidents is thoroughly investigated, assessed and common masses are informed about the underlying causes. In this case the media generally attributed the accident to use of substandard construction material besides highlighting that the construction was illegal (Bhandari, 2006).

Sub-Group I – Water and Climate Related Disasters

This sub-group includes Floods and Drainage Management, Cyclones, Tornadoes and Hurricanes, Hailstorm, Cloud Burst, Heat Wave and Cold Wave, Snow Avalanches, Droughts, Sea Erosion and Thunder and Lightning.

Sub-Group II - Geologically related disasters

THE HIGH POWERED COMMITTEE ON DISASTER MANAGEMENT

In August 1999, a High Powered Committee (HPC) on Disaster Management was set up at the behest of the Prime Minister to look into the issue of Disaster Management Planning at the major bodies: national, state and district levels. The Committee, under the chairmanship of Mr. J. C. Pant, had examined and assessed the issue of disasters holistically, considering both natural and man-made disasters. Profound Emphasis is on preparedness, and the role of different stakeholders in this activity. The Committee has had a number of consultations with various groups, including academicians, technocrats and voluntary agencies to arrive at a common plan. The Committee submitted its report along with a national Response Plan (HPC Report 2002). The HPC now stands converted into the Working Group of the national committee under the Prime Minister. It includes Landslides and Mudflows, Earthquakes, Dam Failures/ Dam Bursts and Mine Fires (Nick Carter, 1991)

Sub-Group III- Chemical, Industrial & Nuclear related disasters

In this category, the chemical and industrial and nuclear disasters have been included.

Sub-Group IV- Accident related disasters

Forest Fires, Urban Fires, Mines Flooding Oil Spill, Major Building Collapse, Serial Bomb Blasts, Festival related disasters, Electrical disasters and Fires, Air, Road and Rail Accidents, Boat Capsizing and Village Fire have been included in this sub-group by HPC.

Sub-Group V – Biologically related disasters

This sub-group includes Biological disasters and Epidemics, Pest Attacks, Cattle epidemics and Food poisoning

CONCLUSION

Like many developing countries have implemented policies to tackle the disasters and natural calamities, India too have certain stratetgic policies implemented. National Disaster Management Authority (NDMA) is an agency of Ministry of Home Affairs whose primary purpose is to mainly coordinate response to natural or man-made disasters and for capacity-building in disaster resiliency and crisis response.

CONCLUSION

Disaster management in India has much organised and structured programmes and policies but administration and implementation of these programs demand more efficiency. In last few decades, flood damages more lives and economy than any other disasters. This paper is an analysis of the trend and preparedness of flood in India. Data from CRED has been availed to analyse the trend of flood and other disasters in last ten years and damaged caused by these events.

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