

## Challenges in Disaster Management

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### Abstract

According to the International Disaster Database and IMF, disasters have been hitting the world continuously and has increased steadily since 1960 dipping only in the past decade. During the last decade of last millennium, natural disasters have killed about 6.7 million people, accounting for 88 percent of all deaths due to disasters. Nearly two-thirds of the people killed in these disasters hail from developing countries. Millions of people are affected every year and natural disasters are huge economic burdens on developing economics as insured loss is less than economic losses compared to developed countries.

The need of the hour is to chalk out a multi-pronged strategy for total disaster management to reduce the toll of disasters in the country. The best strategy is to be Proactive rather than reactive in tackling natural disasters and in mitigating the disasters in case of natural or man-made disasters.

*Key words and Phrases: Disasters, Impact, Earthquake, Cyclone, Floods and Challenges.*

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In Indian mythology, at the end of a 'Kalpa' which is about 4.32 billion year, there is supposed to be a huge deluge where the entire creation would be submerged in water after which creation would start again. Prior to one such deluge, King Satyavrata or Vaivasvata Manu the king of South India, when he was offering water oblation to God in a river, a tiny fish fell in his folded hands. As the king was about to throw away the fish, the fish pleaded not to be thrown in the water but to protect it. The fish grew larger and outgrew water reservoirs and lakes in the kingdom and finally had to be let in the ocean.

This supernatural fish or Matsya in Sanskrit, was none other than Lord Vishnu, who declared that a great deluge would come seven days from then and engulf the entire creation. He ordered Manu to assemble all kinds of seeds, herbs and various beings to load them on a boat, that would be sent by Vishnu on the fateful day. Vishnu reappeared as a horned fish on the day of the deluge to protect the boat, when torrential rains engulfed the earth. After last wave of the flood ended, the life on the earth began with the species stored in the boat again.

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*This is an abridged article of the Keynote Address.*



Matsyavantara



Noah's Ark

A similar story is that of Noah's Ark which is the vessel in the Genesis flood narrative (Genesis chapters 6–9) by which God saves Noah, his family, and a remnant of all the world's animals from the flood.

The story goes on to describe the ark being afloat throughout the flood and subsequent receding of the waters before it came to rest on the Mountains of Ararat.

It is understood that such a story is also in the Holy Quran, where the ark appears as Safina Nuh. The Genesis flood narrative is similar to numerous other flood myths from a variety of cultures. Another earliest known such myth is the Sumerian flood myth found in the Epic of Ziusudra.

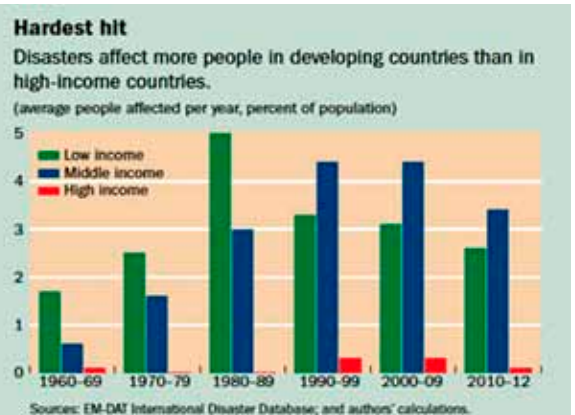
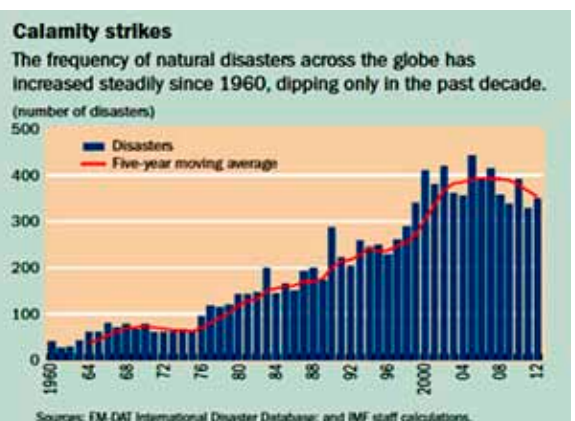
These are the earliest stories of Disaster Management as I can recollect.

According to the International Disaster Database and IMF, disasters have been hitting the world continuously and has increased steadily since 1960, dipping only in the past decade. The hardest hit are only the developing countries.

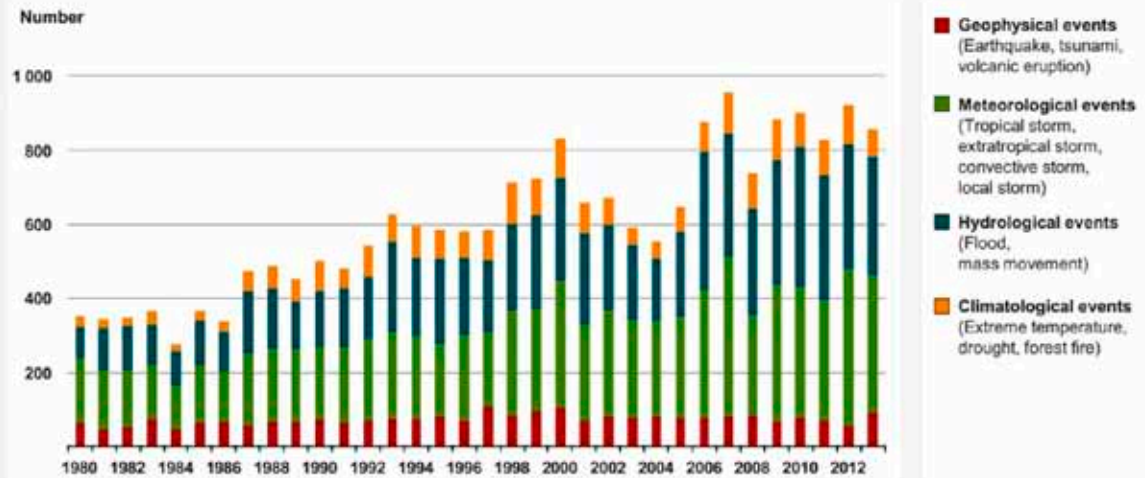
The reasons are obvious- lack of knowledge and preparedness and demographical factors.

### Disaster Management

According to World Development Report (International Federation of Red Cross and Red Crescent (IFRCRC), 2001) natural disasters are categorised as Hydro, Meteorological, Geophysical and Climatological events. The manmade or unnatural disasters encompass conflicts, civil strife, riots and industrial disasters.



During the last decade of last millennium, natural disasters have killed about 6.7 million people, accounting for 88 percent of all deaths due to disasters. Similarly, unnatural disasters have killed about 87,000 people. Nearly two-thirds of the people killed in these disasters hail from developing countries like India, with



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only four percent of the casualties being reported from highly developed countries (IFRCRC, 2001).

Disaster management is essentially a dynamic process. It comprises of management functions like planning, organizing, staffing, leading and controlling. It also involves many organizations working jointly to prevent, mitigate, prepare for, respond to and recover from the effects of disaster.

Floods, droughts, cyclones, earthquakes, and landslides have been a recurrent phenomena. About 60% of the landmass is prone to earthquake of various intensities; an area of over 40 million hectares is prone to floods; about 8 % of total area is prone to cyclones and 68% of the area is susceptible to drought. The loss in terms of private, community and public assets due to disasters has been astronomical. Apart from natural disasters, some cities in India are also vulnerable to chemical, industrial and other manmade disasters. Millions of people are affected every year and the economic losses caused by natural disasters amount to a major share of the Gross National Product (GNP). Natural Disasters are huge economic burdens on developing economies such as India.

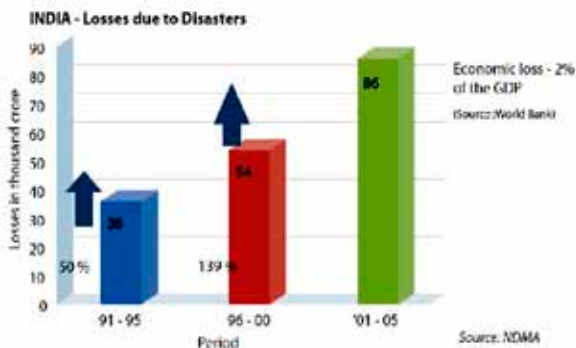
### Impact on Economics

It is seen that the disasters impact the economy of a country substantially. In the short term, economic output shrinks and the fiscal deficit worsens after a disaster. Country's export potential suffers, which leads to larger deficits in trade and services with the rest of the world.



The impact can be alleviated by foreign aid and investment, but after large disasters, the growth and income effects usually persist. A country's growth drops by an average 0.7 percent in the first year after a disaster, with a cumulative output loss after the disaster of about 1.5 percent over and above the immediate direct losses.

Per capita real GDP falls by about 0.6 percent on average and by 1 percent in low-income countries. Droughts have the broadest impact, except in small island states where hurricanes are the most damaging.



One can notice from the above chart that the losses due to disasters account for almost 2% of the GDP. The effect of natural disasters in the Caribbean on growth and debt are sizable. It is observed that, average hurricane reduces a country's output by nearly 1 percent, and a smaller impact from moderate storms by 0.5 percent. Though recovery is there but the negative impact on GDP cannot be ignored. The impact could be similar in case of central America and South America which are more earthquake prone.

Countries with sound financial structure—that is, where more people have bank accounts and more households and businesses have bank loans—suffer less after a disaster. Countries with well-developed financial systems and risk management systems generally run up fiscal deficits but lose less in output.

According to United Nations (UN) global assessment report (GAR) on disaster risk recently states that India loses an estimated Rs.60,915 Cr. annually on account of natural disasters. The figure includes an estimated Rs.46,326 Cr. loss due to floods alone.

During March 2015, the UN member countries met in Sendai, Japan to sign a new Disaster Risk Reduction

(DRR) protocol. This protocol will replace the Hyogo Framework of Action (HFA) which came into existence in 2005, after the Indian Ocean tsunami.

Type of Disaster	Estimated Loss (in Cr. INR)
Earthquakes	118
Cyclones	2,771
Storm Surge	4,507
Tsunami	7,192
Flood	46,326
Total	60,915

Source: UN Global Assessment Report, 2015

The DRR protocol will have a 10 year commitment plan period.

The report also states that “an annual global investment of Rs.37,200 Cr. in disaster risk management strategies would generate total benefits in terms of risk reduction of Rs.22,32,000 Cr. This is equal to 20% reduction in annual losses. Around 48 lakh people are affected by disasters annually but if India doesn't invest in DRR then the number would increase to 1.9 crore by the year 2030.

### Disasters and Lessons Learnt

Ten major natural disasters in the world in the last 10 years in the order of date of occurrence.

- 1. The Gujarat Earthquake, India, 26th May 2001** - With 20,000 fatalities, the Bhuj earthquake was a huge disaster.
- 2. The Bam Earthquake, Iran, 26th December 2003** - The Bam earthquake was the first of the two “Boxing Day” disasters of the noughties. The earthquake was a direct hit on the ancient city of Bam, the centre of which collapsed almost completely. The death toll was fearsome (26,796 people).
- 3. The summer 2003 heatwave in Europe** - The exceptional temperatures recorded in Europe in Summer 2003 is estimated to have killed over 60,000 people—probably for the first time scientists could say with justification that climate change is inducing severe weather events.

4. **The Indian Ocean earthquake and tsunami, 26th December 2004** - The two obvious aspects of this disaster are of course the huge death-toll (165,708 in Indonesia alone, probably 250,000 worldwide, according to the EM-DAT database) across a huge swathe of the coast around the Indian Ocean.
5. **The Simeule / Nias earthquake, Indonesia, 28th March 2005** - With a death toll of 915, this event may seem at first glance to be too small to justify a place in this list. However, this event confirmed the fears of many seismologists that large earthquakes can weaken unfailed sections of adjacent faults, allowing them to rupture in the aftermath of the big event.
6. **The Kashmir earthquake (Pakistan and India), 8th October 2005** - The true toll from the Kashmir earthquake remains unclear – the official total in Pakistan is 73,338, whilst the Red Cross has suggested that a more realistic number may be 100,000.
7. **Hurricane Katrina, USA, 29th August 2005** - The impact of Katrina on New Orleans remains one of the enduring images of the decade. That a major city in a developed country could be so disastrously affected by a hurricane was a shock to many.
8. **The Guinsaigon landslide, Philippines, 17th February 2006** - The tragedy of the Guinsaigon landslide is that the authorities and local people were aware of the threat posed by the slope, and evacuated the town. But, when the heavy rainfall (brought by a typhoon) stopped, the people returned to their homes and schools, only to be buried by the slide.
9. **The Wenchuan Earthquake, China, 12th May 2008** - The impact of the Wenchuan earthquake on the mountains of the Longminshan range was extraordinary. In the aftermath of the earthquake the world watched as the government strove to cope with both the disaster itself and the landslide dams that littered the landscape.
10. **Cyclone Nargis, Burma (Myanmar), 2nd May 2008** - Cyclone Nargis feels like the big event that everyone has forgotten but resulted in death toll of 138,366 people should serve to remind us that Indian Ocean cyclones remain a major threat.

Besides these, three major disasters struck India in 2013 and 2014 one by Phailin Cyclone that hit Odisha coast, cloud-burst in Uttarakhand and floods in Jammu and Kashmir, which wreaked havoc in the country.

## Major Disasters in India during recent periods and actions undertaken

### 1. Cyclone Phailin

Cyclonic Storm Phailin meaning "sapphire" has been the second-strongest tropical cyclone ever to make landfall in India, behind only the 1999 Odisha cyclone also known as **Cyclone 05B**. This became equivalent to a category 5 hurricane when it approached the Odisha Coast. Even with good preparedness, Odisha's state government estimated that, around 12 million people were affected. The cyclone prompted India's biggest evacuation in 23 years with more than 550,000 people moved up from the coastline in Odisha and Andhra Pradesh to safer places. Most of the evacuated people had been sheltered in 500 specially-built cyclone camps in the two states.



Phailin Hits Odisha

The World Bank praised India's evacuation of nearly 10 lakh people in Odisha and Andhra Pradesh, which ensured minimal loss of human lives.

"Successfully evacuating a million people is not a small task. This cannot be merely achieved by kicking the entire state machinery into top gear for three-four days following a cyclone warning," the World Bank said, days after the cyclone Phailin hit the eastern Indian shore. "This has taken years of planning, construction of disaster risk mitigation infrastructure, setting up of evacuation protocols, identification of potential safe buildings and most importantly, working with communities and local organisations in setting up volunteer teams who all knew exactly what needed to be done".

"The Odisha State Disaster Management Authority (OSDMA) and the Government of Odisha need to be given full credit for their unwavering commitment to disaster preparedness and risk mitigation," the Bank said.

Following the earlier disaster in 1999, Odisha set up the OSDMA, the first state agency focused exclusively on disaster management in India.



Relief Work in Odisha



Hudhud Hits Vishakhapatnam

## 2. Cyclone Hudhud

Caused extensive damage to the city of Visakhapatnam and the neighbouring districts of Vizianagaram and Srikakulam of Andhra Pradesh in October 2014. Damages were estimated to be ₹21,908 crore (US\$3.4 billion) by the Andhra state government. At least 124 deaths have been confirmed, a majority of them from Andhra Pradesh and Nepal, with the latter experiencing an avalanche due to the cyclone.

## 3. Uttarakhand Floods

In June 2013, a multi-day cloudburst centered on the North Indian state of Uttarakhand caused devastating floods and landslides becoming the country's worst natural disaster since the 2004 tsunami. Over 95% of the casualties occurred in Uttarakhand. According to figures provided by the Uttarakhand government, more than 5,700 people were "presumed dead." This total included 934 local residents.

Destruction of bridges and roads left about 100,000 pilgrims and tourists trapped in the valleys leading to



Uttarakhand Hit by Cloudburst

three of the four Hindu Chota Char Dham pilgrimage sites. The Indian Air Force, the Indian Army, and paramilitary troops evacuated more than 110,000 people from the flood ravaged area.

The Army, Air Force, Navy, Indo-Tibetan Border Police (ITBP), Border Security Force, National Disaster Response Force (NDRF), Public Works Department and local administrations worked together for quick rescue operations. Several thousand soldiers were deployed for the rescue missions. Activists of political and social organizations were also involved in the rescue and management of relief centres.



Rescue Work in Uttarakhand

Unlike in case of Phailin which hit Odisha, the unprecedented destruction by the cloud burst witnessed in Uttarakhand state was attributed, by environmentalists, to unscientific developmental activities undertaken in recent decades contributing to high level loss of property and lives. Roads constructed in haphazard style, new resorts and hotels built on fragile river banks and more than 70 hydroelectric projects in the watersheds of the state led to a "disaster waiting to happen" as termed by certain environmentalists.



The environmental experts reported that the tunnels built and blasts undertaken for the 70 hydro electric projects contributed to the ecological imbalance in the state, with flows of riverwater restricted and the streamside development activity contributing to a higher number of landslides and more flooding.

This disaster had left the country pondering over the environment concerns which could lead to disasters in the future.

#### 4. Jammu and Kashmir Floods 2014

According to Government sources, in Jammu and Kashmir floods of September 2014, 300 people died and 25 suffered injuries. Apart from this, damage was caused to 2,61,361 structures, farm sector of 3.27 lakh hectares of agricultural land and 3.96 lakh hectares of horticulture land, 6,910 km of road, 559 bridges, 3,063 PHE schemes, 6,423 irrigation works and schemes, 4,202 sub-stations, 11,671 kms of electric conductors.



As in the case of Uttarakhand, it is believed that the state ignored warnings from weathermen, which resulted in the disaster.

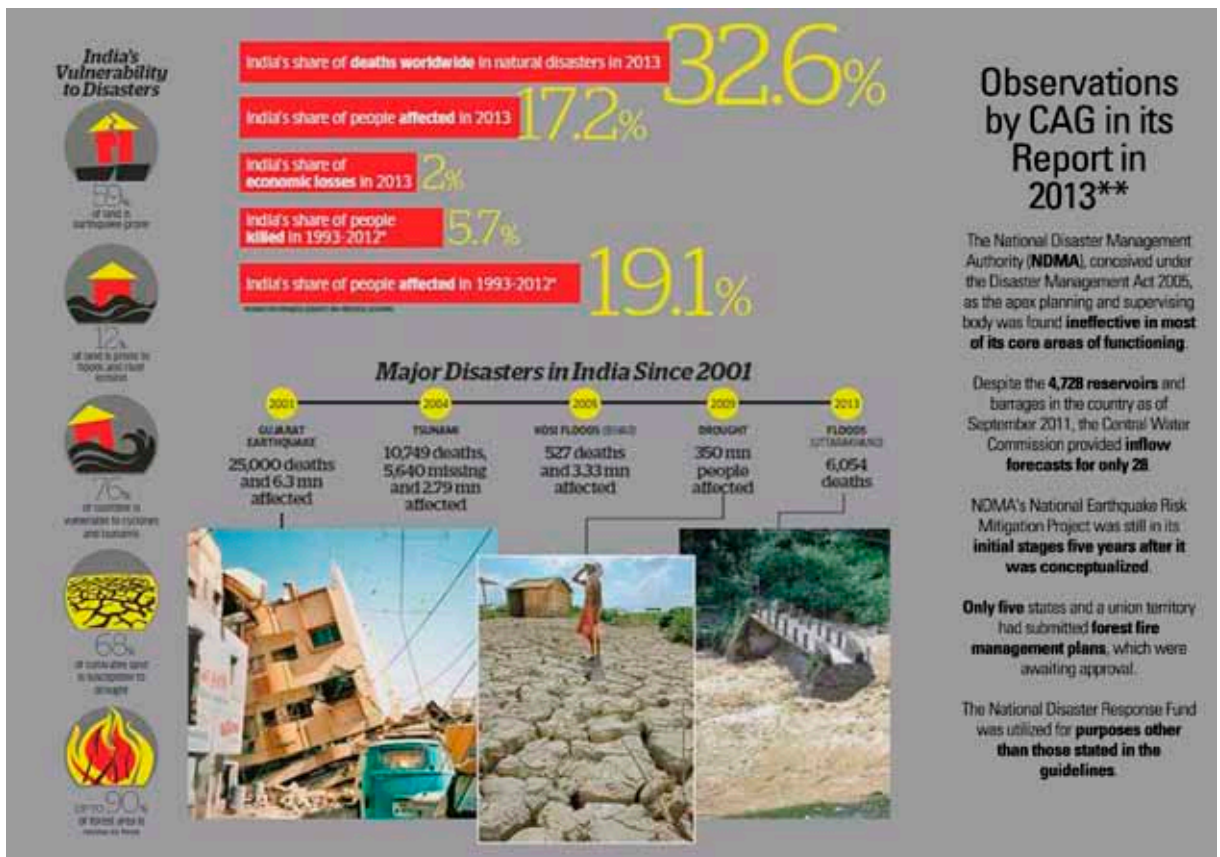


Some information on the vulnerability of India to disasters is given in the following pictures. (Courtesy: Economic Times Magazine, 14-20th, September).

### Increasing Natural Disasters

For Geophysical disasters like volcanoes, earthquakes, rockfalls, landslides, and avalanches, there may be no clear-cut causal relationship between the disaster and the weather. But, for climate-related disasters, one can draw direct causal relations between disasters and the weather. These include hydrological events such as floods, storm surges, and coastal flooding, plus meteorological events like storms, tropical cyclones, heat/cold waves, drought, and wildfires.

Another thing that has risen in the recent years are the financial costs incurred by natural disasters. International organizations such as the Red Cross say that, the world's yearly post-disaster cost is around 65 billion US dollars. Compared that to the four billion spent fifty years ago, adjusted for inflation, and one can realise how expensive preparations have become.





million people. The government, with the help of the armed forces has rescued 130,000 people. The floods are yet another reminder of the increasing frequency of disasters, increasingly linked to climate change and unchecked development, and India's inability to cope with them. ET Magazine takes a look at India's recent trysts with calamities and where it stands on the global map

by G Seetharaman

## Top 10 Natural Disasters in 2013



## Human Impact: Top 10 Countries by Deaths in 2013



## Economic Impact: Ten Countries by Highest Losses Suffered in 2013



## Top 10 Countries by People Affected

(in millions)

Because of our careless abuse of the environment, the number of natural disasters and the cost of cleaning them up will continue to rise. This should sound caution to us.

### Challenges for the Future

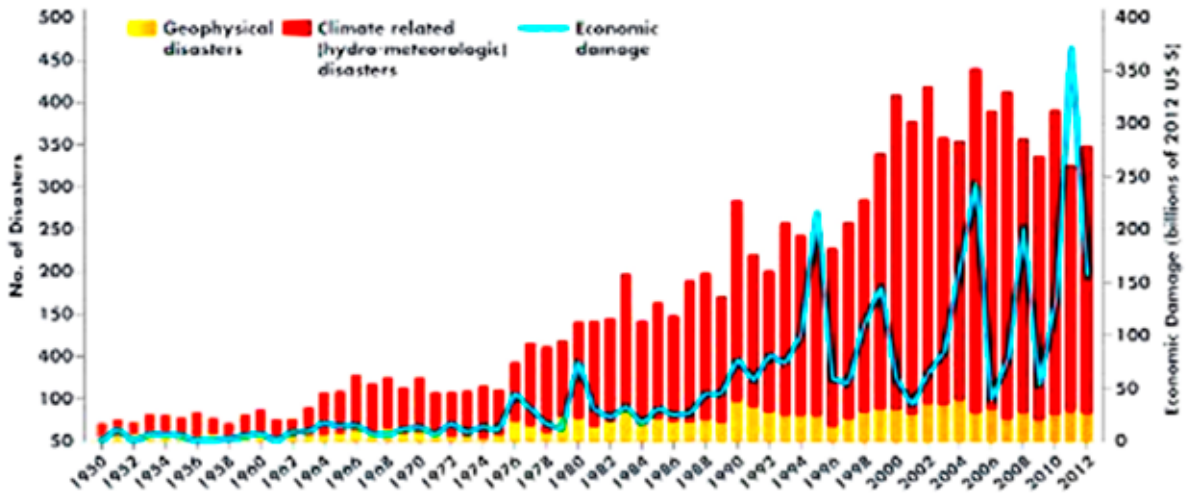
There is a growing need to look at disasters from a development perspective. Disasters can have devastating effect on communities and can significantly set back development efforts to a great extent.

But then, it could also offer an opportunity to invest

in development efforts in a post disaster scenario. Disasters are opportunities for communities to reinvent themselves.

One of the glaring lacunae in the process of Disaster Management in India has been the overlooking of unnatural disasters.

Current global situation also demands initiatives in managing the impact of unnatural disasters. Developments at the international level, particularly culminating on 9/11 have brought the issue of unnatural disasters at the forefront.



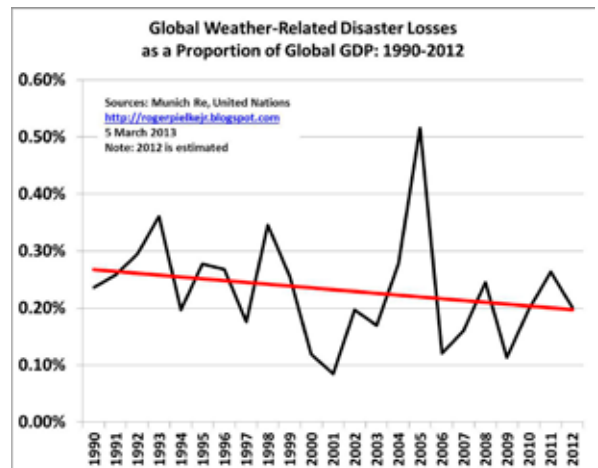
The Rising Cost of Global Warming: Increasing Frequency and Cost of Natural Disaster



Nuclear Power Plant Explosion in Chernobyl, Russia



The Exxon Valdez Oil Spill, Alaska, USA



The global community has recognized the serious consequences of Nuclear, Biological and Chemical (NBC) warfare. Hence, unnatural disasters remain a serious challenge for India to address in the near future.

The need of the hour is to chalk out a multi-pronged strategy for total disaster management comprising prevention, preparedness, response and recovery on the one hand and initiate development efforts, on the other.

The countries in the Asia-Pacific region should establish a regional co-ordination mechanism for space-technology based disaster mitigation.

Some of the initiatives in disaster management could be as follows:

- Frame good macroeconomic policies before and after shocks.
- Provision in the budget for emergency spending helps crisis mitigation and resolution, insurance coverage and low public debt bolster government spending flexibility if reconstruction needs arise.
- Public investment in risk reduction.
- Improvement in government policy frameworks to better manage risk and mitigate economic and social costs.
- Estimate the probability of shocks and identify local vulnerabilities and integrate into plans for contingencies, investing in risk reduction, insurance, self-insurance, and disaster response.
- Tax and spending policies need to be flexible, to allow rapid redeployment of spending when needed.
- Coordination with foreign partners before disaster strikes could mobilize external assistance for risk reduction, which is likely to earn a higher return than emergency help after the fact.

A pro-active stance to reduce the toll of disasters in the country requires a more comprehensive approach that comprises both pre-disaster risk reduction and post-disaster recovery. Such an approach should involve the following set of activities:

- Risk analysis to identify the kinds of risks faced by people and development investments as well as their magnitude;
- Prevention and mitigation to address the structural sources of vulnerability;
- Risk transfer to spread financial risks over time and among different actors;
- Emergency preparedness and response to enhance a country's readiness to cope quickly and effectively with an emergency; and
- Post-disaster rehabilitation and reconstruction to support effective recovery and to safeguard against future disasters.

## Conclusion

*'Should we be talking dollars and cents in the face of human tragedy? The first imperative of public policy should be to save lives, but efforts to reduce economic costs, which carry other human and social costs that can last for generations, are also important. When the economic costs are lessened resources are freed up for disaster preparedness, resilience, and mitigation, which can save lives in the future'* say Nicole Laframboise and Sebastian Acevedo.

Sri Suresh Prabhu, Union Minister for Railways once remarked *'Because of the climate change, the intensity and frequency of natural calamities are bound to rise'* This has to be viewed with more concern.

It is learnt that the topic of the workshop on intercultural aspects of disaster management is a topic that is being researched to ensure effectiveness of disaster management and inculcating the cultural awareness and sensitivity which are important factors for the successful planning and implementation of disaster management efforts among multi-cultural expert groups. The workshop is addressing such an important concern.

Disaster management teams composed of experts from different countries have been more and more common in the past and will continue to be so in future. The disaster-management organizations from the affected countries will more frequently seek help from the international community. Hence, it is essential that the cultural aspects are integrated in disaster management work which would ensure an adequate appreciation for the cultural norms and values of the people working in the group to manage the disaster.

The best strategy is to be Proactive rather than reactive in tackling natural disasters and in mitigating the disasters in case of natural or man-made disasters.

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