

“Environmental Calamity - Managing the Risk” Disaster Management

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Abstract: "The creator devotes this review to every single pure traveler and inhabitants who have ended up casualties of later past regular cataclysm which we have seen in Uttarakhand, India". All people group and nations are defenseless against calamities, both normal and man-made. India's geo-climatic conditions and additionally its high level of socio - financial openness, makes it a standout amongst the most debacle inclined nation on the planet to experience the ill effects of different cataclysmic events, to be specific dry season, surge, twister, earth tremor, avalanche, woodland fire, hail storm, insect, volcanic emission, and so on. Which strike creating an overwhelming effect on human life, economy and condition? Different debacles like tremor, avalanches, volcanic emissions, flames, surge and twisters are common dangers that murder a great many individuals and pulverize billions of dollars of living space and property every year. The quick development of the total populace and its expanded focus regularly in perilous condition has heightened both the recurrence and seriousness of cataclysmic events. With the tropical atmosphere and unsteady land shapes, combined with deforestation, impromptu development multiplication non-built developments which make the calamity inclined zones unimportant helpless, late correspondence, poor or no budgetary distribution for fiasco counteractive action, creating nations endure pretty much incessantly by catastrophic events. Asia beat the rundown of losses because of cataclysmic event. Among different common dangers, seismic tremors, avalanches, surges and typhoons are the real calamities antagonistically influencing huge regions and populace in the Indian sub-mainland. The discernment about debacle and its administration has experienced a change taking after the order of the Disaster Management Act, 2005.

Keywords: National Disaster Management Authority (NDMA), National Disaster Response Force (NDRF), National Institute of Disaster Management (NIDM), The International Association (IAEM), The International Recovery Platform (IRP), World Conference On Disaster Reduction (WCDR), International Strategy For Disaster Reduction (ISDR).

I. Introduction

Disaster Management is the train of managing and staying away from both common and synthetic fiascos. It includes readiness, reaction and recuperation with a specific end goal to reduce the effect of debacles. All parts of crisis administration manage the procedures used to shield populaces or associations from the outcomes of fiascos, wars and demonstrations of fear based oppression. Disaster Management doesn't really turn away or dispose of the dangers themselves, in spite of the fact that the review and forecast of the dangers is an imperative piece of the field. The fundamental levels of crisis administration are the different sorts of hunt and safeguard movement.

Fiasco administration can be characterized as the association and administration of assets and obligations regarding managing every single philanthropic part of crises, specifically readiness, reaction and recuperation with a specific end goal to diminish the effect of debacles. The entire cycle of Disaster Management can be portrayed by taking after figure 1.1.



Figure 1.1: Etymology

The word ‘Disaster’ derives from Middle French *désastre* and that from Old Italian *disastro*, which in turn comes from the Greek pejorative prefix *δυσ-*, (*dus-*) “bad”+ *αστήρ* (*aster*), “star”. The root of the word *disaster* (“bad star” in Greek and Latin) comes from an astrological theme in which the ancients used to refer to the destruction or deconstruction of a star as a disaster.

II. Meaning of Disaster Management

Calamity is an occasion or arrangement of occasions, which offers ascend to setbacks and harm or loss of properties, frameworks, condition, fundamental administrations or method for work on such a scale which is past the ordinary limit of the influenced group to adapt to. Fiasco is additionally some of the time depicted as a "disastrous circumstance in which the typical example of life or eco-framework has been disturbed and additional conventional crisis mediations are required to spare and protect lives as well as the earth".

III. Sorts of Disasters

There is no nation that is insusceptible from catastrophe, however defenselessness to debacle differs. There are four principle sorts of debacle.

3.1 Natural debacles

These debacles incorporate surges, tropical storms, quakes and fountain of liquid magma ejections that can impacts affect human wellbeing, and also auxiliary effects bringing on additional demise and experiencing surges creating avalanches, seismic tremors bringing about flames, tidal waves bringing on across the board flooding and hurricanes sinking ships.

3.2 Environmental Emergencies

These crises incorporate innovative or mechanical mishances, for the most part including risky material, and happen where these materials are delivered, utilized or transported. Vast timberland flames are for the most part incorporated into this definition since they have a tendency to be brought about by people.

3.3 Complex Emergencies

These crises include a separate of specialist, plundering and assaults on key establishments. Complex crises incorporate clash circumstances and war.

3.4 Pandemic Emergencies

These crises include a sudden onset of an infectious malady that influences wellbeing additionally upsets administrations and organizations, bringing monetary and social expenses.

3.5 Man-made Disaster

Calamities created by substance or mechanical mishances, ecological contamination, transport mishaps and political agitation are delegated "human-made" or "human-prompted" catastrophes since they are the immediate aftereffect of human activity.

IV. Institutional and Legal Arrangements of Disaster Management

The Act sets down institutional, legitimate, money related and coordination components at the national, state, region and nearby levels. These establishments are not parallel structures and will work in close amicability.

4.1 Institutional Framework under the Disaster Management Act

4.1.1 National Disaster Management Authority (NDMA)

The NDMA, as the pinnacle body for debacle administration, is going by the Prime Minister and has the obligation regarding setting down approaches, arrangements and rules for DM (and planning their requirement and usage for guaranteeing opportune and powerful reaction to fiascos). It will endorse the National Disaster Management and DM arrangements of the Central Ministries/Departments. NDMA has the ability to approve the Departments or experts worried, to make crisis acquirement of arrangements or materials for save and alleviation in a debilitating calamity circumstance or fiasco.

4.1.2 The National Executive Committee

The National Executive Committee (NEC) contains the Union Home Secretary as the Chairperson, and the Secretaries to the GOI in the Ministries/Departments of Agriculture, Atomic Energy, Defense, Drinking Water Supply, Environment and Forests, Finance (Expenditure), Health, Power, Rural Development, Science and Technology, Space, Telecommunications, Urban Development, Water Resources and the Chief of the Integrated Defense Staff of the Chiefs of Staff Committee as individuals. Secretaries in the Ministry of External

Affairs, Earth Sciences, Human Resource Development, Mines, Shipping, Road Transport and Highways and Secretary, NDMA will be extraordinary invitees to the gatherings of the NEC.

4.1.3 State Disaster Management Authority (SDMA)

At the State level, the SDMA, headed by the Chief Minister, will set down approaches and plans for DM in the State. It will, bury alia favor the State Plan as per the rules set around the NDMA, organize the usage of the State Plan.

4.1.4 District Disaster Management Authority (DDMA)

The DDMA will be going by the District Collector, Deputy Commissioner or District Magistrate all things considered, with the chose illustrative of the neighborhood expert as the Co-Chairperson. DDMA will go about as the arranging, planning and executing body for DM at District level and take every single vital measure for the reasons for DM as per the rules set around the NDMA and SDMA.

4.1.5 National Disaster Response Force (NDRF)

The **DISASTER MANAGEMENT Act, 2005** has made the statutory arrangements for the constitution of the National Disaster Response Force (NDRF) with the end goal of specific reaction to normal and man-made debacles. As indicated by Section 45 of the Act, the Force needs to work under the general superintendence, heading and control of the National Disaster Management Authority (NDMA) and under charge and supervision of Director General, NDRF. In spite of the fact that the units of this Force were designated in 2003, it is simply after the foundation of NDMA that their preparation and preparing were energetically sought after. In lieu with the Section 44 (i) of the Act that states NDRF an expert constrain, the compel is step by step developing as the most obvious and energetic multi-disciplinary, multi-talented, innovative drive of the NDMA equipped for managing a wide range of regular and man - made catastrophes. With the end goal of specific reaction to a debilitating catastrophe circumstance or calamities/crises both characteristic and man-made, for example, those of Chemical, Biological, Radiological and Nuclear beginning, the Act has commanded the constitution of a National Disaster Response Force (NDRF). The general superintendence, course and control of this drive might be vested in and practiced by the NDMA and the order and supervision of the Force should vest in an officer to be selected by the Central Government as the Director General of Civil Defense and National Disaster Response Force. By and by, the NDRF includes eight legions and further development might be considered at the appropriate time. These contingents will be situated at various areas as might be required.

4.1.6 National Institute of Disaster Management (NIDM)

The National Institute of Disaster Management constituted under the Disaster Management Act 2005 has been endowed with the nodal national duty regarding human asset advancement, limit building, preparing, research, documentation and arrangement promotion in the field of calamity administration. Updated from the National Center for Disaster Management of the Indian Institute of Public Administration on sixteenth October, 2003, NIDM is consistently walking forward to satisfy its main goal to make a fiasco flexible India by creating and advancing a culture of counteractive action and readiness at all levels. The NIDM, in organization with other research foundations has limit advancement as one of its real obligations, alongside preparing, research, documentation and improvement of a national level data base. It will connect with other learning based organizations, and capacity inside the wide strategies and rules set around the NDMA.

Rundown of ten deadliest calamities which have happened over the world and in India in the known history and in the most recent century might be seen from the Table 1.1

| S. N | Name of Event | Year | State and Area | Fatalities |
|------|-------------------|------|----------------------|-----------------|
| 1 | Earthquake | 1668 | Mumbai, Maharashtra | 2000 deaths |
| 2 | Bengal Earthquake | 1737 | Bengal | 3,00,000 deaths |
| 3 | Cyclone | 1864 | Kolkata, West Bengal | 60,000 deaths |
| | | | | 58.5 Million |

| | | | | |
|----------------------------|----------------------------|-------------------|--|---|
| 4 | The Great Famine | 1876 – 1878 | Southern India | people affected 5.5 million deaths due to starvation |
| 5 | Cyclone | 1882 | Mumbai, Maharastra | 1,00,000 deaths |
| 6 | The Indian Famine | 1896 – 1897 | Whole India | 1.25 million to 10 million deaths |
| 7 | Earthquake | 1934 | Bihar | 6000 deaths |
| 8 | Bhola Cyclone | 1970 | West Bengal | 5,00,000 deaths (including Hindu Kush Himalayas and surrounding areas) |
| 9 | Drought | 1972 | Large part of the country | 200 million people affected |
| 10 | Drought | 1987 | Haryana | 300 million people affected |
| IN THE LAST CENTURY | | | | |
| 1 | Earthquake | 1905 | Kangra, Himachal Pradesh | 20,000 deaths |
| 2 | Cyclone | 1977 | Andhra Pradesh | 10,000 deaths Hundreds of Thousands homeless 40,000 cattle deaths, destroyed 40% of India’s food grain |
| 3 | Lature Earthquake | 1993 | Lature, Marthawada, region of the Maharastra | 7,928 people died and another 30,000 were injured |
| 4 | Orrisa Super Cyclone | 1999 | Orissa | 10,000 deaths |
| 5 | Gujrat Earthquake | 2001 | Bhuj, Bachau, Anjar, Ahmedabad, and Surat in Gujarat State | 25,000 deaths, 6.3 million affected |
| | | | | 15,749 deaths |

| | | | | |
|----|-----------------------|--------------|---|--|
| 6 | Tsunami | 2004 | Coastline of Tamilnadu, Kerala, Andhara Pradesh & Pondecherry as well as Andaman and Nicobar Island of India | 5640 person missing 2.79 million people affected 11,827 hectares of crops damaged 3,00,000 fishers folk lost their livelihood |
| 7 | Maharastra Flood | 2005 july | Maharastra State | 1094 deaths, 167 injured, 55 missing |
| 8 | Kashmir Earthquake | 2005 | Kashmir State | 86000 deaths (including Kashmir and surrounding Himalayan region) |
| 9 | Kosi Floods | 2008 | North Bihar | 527 Deaths, 19,323 Livestock perished 2,22,754 house damaged 33,29,423 persons affected |
| 10 | Cyclone Nisha | 2008 | Tamil Nadu | 204 deaths, \$800 Million worth damage |

Source**- Assumed Casualty by several News Papers 24 June 2013 Lucknow Edition

V. Distribution of People Affected By Disaster in India

Figure 1.2 shows the distribution of people affected by disaster in the world between 1975 and 2001.



Figure 1.2: From the above figure we can easily understand that Alaska, North America, Australia are the safe place while the India is most dangerous place to live on the view of Disaster

VI. The Indian Scenario for Disaster Management

India due to its geo-climatic and socio-economic condition is prone to various disasters. During the last thirty years’ time span the country has been hit by 431 major disasters resulting into enormous loss to life and property. According to the Prevention Web statistics, 143039 people were killed and about 150 crore were affected by various disasters in the country during these three decades. The disasters caused huge loss to property and other infrastructures costing more than US \$ 4800 crore. In India, the cyclone which occurred on 25th November, 1839 had a death toll of three lakh people. The Bhuj earthquake of 2001 in Gujarat and the Super Cyclone of Orissa on 29th October, 1999 are still fresh in the memory of most Indians and cloud burst and mudflow in Leh and surrounding areas in the morning of 6th August, 2010.

The most recent natural disaster of a cloud burst resulting in flash floods and mudflow in Uttarakhand and Kedarnath areas in the early hours of 16th June, 2013, caused severe damage in terms of human lives as well as property. There was a reported death toll of 1200 persons, about 5000 missing persons, 4200 pets (have economic value) 3,661 damaged houses in about 500 villages and 27,350 hectares of affected crop area**.

VII. India - Disaster Statistics

Data related to human and economic losses from disasters that have occurred between 1980 and 2010 (table 1.2).

Table 1.2: Natural Disasters from 1980 – 2010

| | |
|---|---------------|
| <i>No of events:</i> | 431 |
| <i>No of people killed:</i> | 143,039 |
| <i>Average killed per year:</i> | 4,614 |
| <i>No of people affected:</i> | 1,521,726,127 |
| <i>Average affected per year:</i> | 49,087,940 |
| <i>Economic Damage (US\$ X 1,000):</i> | 48,063,830 |
| <i>Economic Damage per year (US\$ X 1,000):</i> | 1,550,446 |

Natural Disaster Occurrence Reported

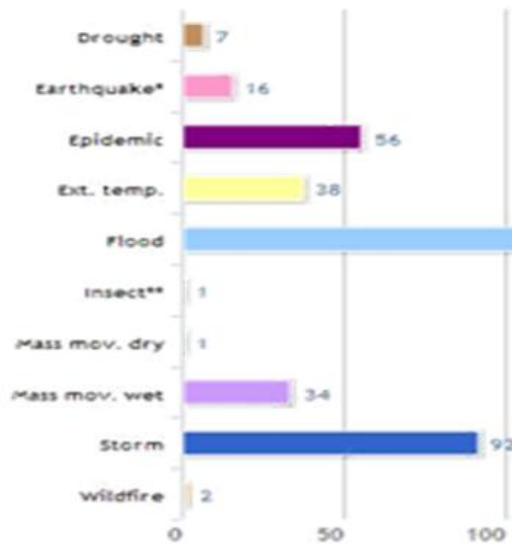


Figure 1.3: Top 10 Natural Disasters Reported

Affected People

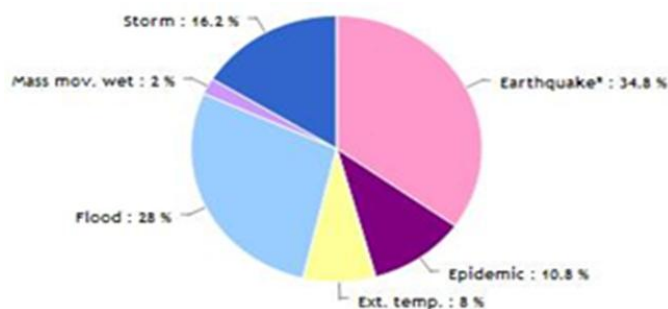
| Disaster | Date | Affected (no. of people) |
|----------|------|--------------------------|
| Drought | 1987 | 300,000,000 |
| Drought | 2002 | 300,000,000 |
| Flood | 1993 | 128,000,000 |
| Drought | 1982 | 100,000,000 |
| Drought | 2000 | 50,000,000 |
| Flood | 2002 | 42,000,000 |
| Flood | 1982 | 33,500,000 |
| Flood | 2004 | 33,000,000 |
| Flood | 1995 | 32,704,000 |
| Flood | 1980 | 30,000,023 |

Killed People

| Disaster | Date | Killed (no. of people) |
|---------------|------|------------------------|
| Earthquake* | 2001 | 20,005 |
| Earthquake* | 2004 | 16,389 |
| Storm | 1999 | 9,843 |
| Earthquake* | 1993 | 9,748 |
| Epidemic | 1984 | 3,290 |
| Epidemic | 1988 | 3,000 |
| Storm | 1998 | 2,871 |
| Extreme temp. | 1998 | 2,541 |
| Flood | 1994 | 2,001 |
| Flood | 1998 | 1,811 |

Figure 1.5: Number of people killed in various disasters

Statistics by Disasters Type Percentage of Reported People Killed by Disaster Type



*Source of data: "EM-DAT: The OFDA/CRED International Disaster Database, University catholique de Louvain, Brussels, Bel." Data version: v11.08

Table 1.3: The most severe disasters in the country and their impact in term of people affected, lives lost and economic damage

| <i>Year</i> | <i>Type Of Disaster</i> | <i>People Affected</i> | <i>Life Lost</i> | <i>Economic Damage (USD X 1,000)</i> |
|-------------|-------------------------|------------------------|------------------|--------------------------------------|
| 1980 | Flood | 30,000,023 | | |
| 1982 | Drought | 100,000,000 | | |
| | Flood | 33,500,000 | | |
| 1984 | Epidemic | | 3290 | |
| 1987 | Drought | 300,000,000 | | |
| 1988 | Epidemic | | 3000 | |
| 1990 | Storm | | | 2,200,000 |
| 1993 | Flood | 128,000,000 | | 7,000,000 |
| | Earthquake | | 9,748 | |
| 1994 | Flood | | 2001 | |
| 1995 | Flood | 32,704,000 | | |
| 1996 | Storm | | | 1,500,300 |
| 1998 | Storm | | 2871 | |
| | Extreme Temp | | 2541 | |
| | Flood | | 1811 | |
| 1999 | Storm | | 9843 | 2,500,000 |
| 2000 | Drought | 50,000,000 | | |
| 2001 | Earthquake | | 20,005 | 2,623,000 |
| 2002 | Drought | 300,000,000 | | |
| | Flood | 42,000,000 | | |
| 2004 | Flood | 33,000,000 | | 2,500,000 |
| | Earthquake | | 16,389 | |
| 2005 | Flood | | | 3,330,000 |
| | Flood | | | 2,300,000 |
| 2006 | Flood | | | 3,390,000 |
| 2009 | Flood | | | 2,150,000 |

*(Includes Tsunami) ** Source “EM-DAT: THE OFDA/CRED International Disaster Database

VIII. International Organizations of Disaster Management

8.1 International Association of Emergency Managers

The International Association of Emergency Managers (IAEM) is a non-profit educational organization dedicated to promoting the goals of saving lives and protecting property during emergencies and disasters. The mission of IAEM is to serve its members by providing information, networking and professional opportunities, and to advance the emergency management profession. It currently has seven Councils around the World, Asia, Canada, Europe, International, Oceania, Student and USA The Air Force Emergency Management Association (www.af-em.org, www.3e9x1.com, and www.afema.org), affiliated by membership with the IAEM, provides emergency management information and networking for US Air Force Emergency Managers.

8.2 International Recovery Platform

The International Recovery Platform (IRP) was considered at the World Conference on Disaster Reduction (WCDR) in Kobe, Hyogo, Japan in January 2005. As a topical stage of the International Strategy for Disaster Reduction (ISDR) framework, IRP is a key column for the usage of the Hyogo Framework for Action (HFA) 2005–2015: Building the Resilience of Nations and Communities to Disasters, a worldwide arrangement

for debacle chance diminishment for the decade embraced by 168 governments at the WCDR.

The key part of IRP is to distinguish holes and limitations experienced in post debacle recuperation and to fill in as an impetus for the advancement of apparatuses, assets, and limit with regards to versatile recuperation. IRP means to be a universal wellspring of learning on great recuperation rehearse.

8.3 Red Cross/Red Crescent

National Red Cross/Red Crescent social orders regularly have crucial parts in reacting to crises. Moreover, the International Federation of Red Cross and Red Crescent Societies (IFRC or "The Federation") may send appraisal groups, e.g. Field Assessment and Coordination Team – (FACT) to the influenced nation if asked for by the national Red Cross or Red Crescent Society. In the wake of having surveyed the requirements Emergency Response Units (ERUs) might be conveyed to the influenced nation or district. They are represented considerable authority in the reaction part of the crisis administration structure.

8.4 United Nations

Inside the United Nations framework duty regarding crisis reaction rests with the Resident Coordinator inside the influenced nation. Nonetheless, practically speaking universal reaction will be composed, if asked for by the influenced nation's administration, by the UN Office for the Coordination of Humanitarian Affairs (UN-OCHA), by sending an UN Disaster Assessment and Coordination (UNDAC) group.

8.5 World Bank

Since 1980, the World Bank has affirmed more than 500 operations identified with debacle administration, adding up to more than US\$40 billion. These incorporate post-fiasco recreation ventures, and in addition ventures with parts went for averting and moderating catastrophe impacts, in nations, for example, Argentina, Bangladesh, Colombia, Haiti, India, Mexico, Turkey and Vietnam to give some examples.

Basic regions of center for anticipation and relief ventures incorporate backwoods fire aversion measures, for example, early cautioning measures and instruction crusades to debilitate ranchers from cut and blaze farming that touches off woodland fires; early-cautioning frameworks for tropical storms; surge counteractive action components, running from shore insurance and terracing in rustic zones to adjustment of generation; and quake inclined development. In a joint wander with Columbia University under the umbrella of the ProVention Consortium the World Bank has built up a Global Risk Analysis of Natural Disaster Hotspots.

In June 2006, the World Bank built up the Global Facility for Disaster Reduction and Recovery (GFDRR), a more drawn out term organization with other guide contributors to lessen catastrophe misfortunes by mainstreaming calamity hazard decrease being developed, in support of the Hyogo Framework of Action. The offices helps creating nations subsidize improvement ventures and projects that upgrade neighborhood capacities with respect to catastrophe counteractive action and crisis readiness.

8.6 European Union

Since 2001, the EU received Community Mechanism for Civil Protection, which began to assume a huge part on the worldwide scene. Instrument's principle part is to encourage co-operation in common insurance help intercessions in case of significant crises which may require earnest reaction activities. This applies additionally to circumstances where there might be an inevitable risk of such real crises.

The heart of the Mechanism is the Monitoring and Information Center. It is a piece of Directorate-General for Humanitarian Aid and Civil Protection of the European Commission and available 24 hours a day. It gives nations access to a stage, to a one-stop-shop of common assurance implies accessible among the all the taking an interest states. Any nation inside or outside the Union influenced by a noteworthy calamity can make an interest for help through the MIC. It goes about as a correspondence center point at base camp level between taking part expresses, the influenced nation and dispatched field specialists. It additionally gives helpful and overhauled data on the real status of a progressing crisis.

8.7 India

The part of crisis administration in India tumbles to National Disaster Management Authority of India, an administration office subordinate to the Ministry of Home Affairs. Lately there has been a move in accentuation from reaction and recuperation to key hazard administration and lessening, and from a legislature focused way to deal with decentralized group interest. The Ministry of Science and Technology, headed by Dr Karan Rawat, bolsters an inside office that encourages explore by bringing the scholarly learning and aptitude of earth researchers to crisis administration.

A gathering speaking to an open/private has as of late been framed by the Government of India. It is subsidized basically by a vast India-based PC organization and went for enhancing the general reaction of groups to crises, notwithstanding those occurrences which may be portrayed as fiascos. A portion of the

gatherings' initial endeavors include the arrangement of crisis administration preparing for specialists on call (a first in India), the formation of a solitary crisis phone number, and the foundation of norms for EMS staff, gear, and preparing. It works in three states, however endeavors are being made in making this an across the country successful gathering.

8.8 Aniruddh Sharma's Academy of Disaster Management (AADM)

Aniruddh's Academy of Disaster Management (AADM) is a Non-Profit Organization in Mumbai, India with 'Calamity Management' as its primary goal.

IX. Conclusions

Aside from loss of human lives, cataclysmic events cause serious harm to biology and economy of an area. With establishment of new innovations and by receiving space innovation as INSAT and IRS arrangement of satellites, India has built up an operational system for catastrophe cautioning particularly twister and dry season, and their observing and alleviation. In any case, forecast of specific occasions likes quake, volcanic ejection and surge is still at test level. Fiascos disturb advance and annihilate the well deserved products of meticulous formative endeavors, regularly pushing countries, in journey for advance, back by a very long while. In this way, productive administration of catastrophes, as opposed to unimportant reaction to their event has, lately, got expanded consideration both inside India and abroad. This is as much an aftereffect of the acknowledgment of the expanding recurrence and force of fiascos as it is an affirmation that great administration, in a minding and humanized society, needs to bargain successfully with the overwhelming effect of catastrophes.

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