

An Introduction to Disaster Management

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Abstract

Nature has been an uncertain phenomenon creating prodigious human, environmental and economic losses by the catastrophes like earthquakes, floods, cyclone or even man-made calamities called disasters. Any extensive disaster may extricate a substantial number of humanity which without an extensive disaster participation by the government and humanitarian agencies may depart in multitude from starvation, epidemic, etc. So it is important to cognize propositions concerning the different aspects of disaster, concept of disaster management, its objectives, developmental efforts integrating disaster risk minimization into development project for sustainable development. Disaster management needs diverse proposition commanding dexterity, wealth and allegiance of corporate, government representatives, inter-governmental and non-governmental establishments, humankind, etc. A clear-sighted methodology for disaster management is the crying need of the hour and, hence, there should be sincere efforts to manage the problems of natural and man-made disasters. Against this backdrop, this paper is an attempt to discuss the concept of disasters, their implication on human life and growth. This paper also appraises the gravity of disaster management and the challenges that need to be considered during disaster ramification.

Keywords: Disaster management, Hazard, Principles, Prevention, Effects.

INTRODUCTION

Disaster management is the organization and management of resources and responsibilities for maneuvering both natural and humanitarian aspects of emergencies, in particular preparedness, response and recovery to lessen the ramification of disasters. Disaster management does not ineluctably deflect or exterminate the menaces. Ironically, ventures to dominate nature have delineated the humanity to new menaces. Disasters are the outcome of natural or human induced ventures with the prospects to generate catastrophe; but divulgence to hazard need not inexorably express disaster. Degree of proneness of those divulged to the hazard spreads risk and possibility of the disastrous occurrence [1]. Disaster purport also vacillates according to geo-sectors, geological and social settings, and every new disaster adds amplitude to human sufferings [2]. For these reasons, governments should place more priority to disaster management. But it has not been the case so far. Constant concerted opus, demeanor of national amplitude and individual's involvement may remove the problems of disasters and help build a safer and secure nation. Considering the problems, an effort has been made in this paper to study the different aspects of disasters and evaluate the importance of disaster management. The study also offers few recommendations for pursuing sound disaster management.

II. OBJECTIVE OF THE STUDY

- ✓ To discuss the concept of disaster and their impact;
- ✓ To evaluate the importance of disaster management and the challenges that need to be considered;
- ✓ To offer recommendations for improvement of disaster management.

LITERATURE REVIEW

Disaster as an unsought incident is incontinently overwhelming[3]. Disaster being a destructive, deadly and disruptive incident connects hazard with human [4]. Disaster happening precipitously can be grouped as dangerous and calamitous incident that besieges and sabotages infrastructures [5]. From a different discernment, a disaster can cause serious sickness and social cataclysm, or an crucial economic catastrophe[6]. Disaster causes damage to human lives and fabricated establishments[7]. Disasters are defined based on time and space [8]. Disaster combines vulnerability, lack of measures and hazards requiring implementation of appropriate measures for planning and use of resources to mitigate the adverse impacts [9]. An exhaustive disaster plan embraces all hazards, disciplines and related organizations in the disaster management process [10]. Disaster managers must encounter internal and external barriers [11]. A unified

disaster risk management and insightful reformation normally pilots to the most efficacious modality for risk management. The study on the association between climate change and disasters in Europe reveals that climate change has an impact on certain weather and there are embryonic identical indication for events like hurricanes [12]. Disasters also can divulge to outsiders what was imperceptible before vulnerabilities and vulnerable groups [13]. In few occasions, women and other marginalized groups are invisible both geographically and socio-politically despite their sufferings inordinately in disasters [14]. This is mostly sarcastic considering the hominality and effermination of disasters in many cultures [15]. Few short-term human adjustments may actually increase the long-run vulnerability [16]. Local knowledge is engrained in individual and group action [17]. Despite various systems, household preparedness and endurance potential appear to be much dictated by economic and social circumstances [18]. Research has to be designed to people's capability based on their assets and needs, and building their trust [19].

MATERIALS & METHODOLOGY

The study is descriptive in nature and conducted by variety literature in terms of disasters and their impacts. Descriptive research has been preferred for developing a better profundity of knowledge. Thus, this study purely adopts secondary data collection strategy, and considers a variety of secondary sources accessed through the Internet and academic databases viz. literature reviews, empirical studies, website, books, journals, reports, etc. Inherent limitation of the study is that as the study is based on published data and information, and this secondary sources may be lacking in authenticity, the result inferred there from may not be completely reliable. The corpus of this paper is, therefore, limited to establish, in the first place, a global sketch on disaster management. In the second place, an assessment on the foremost mission endeavoring the discernment of the effect of disaster management has been delineated.

RESULTS AND DISCUSSIONS

Disaster Management - Conceptual perspective

Disaster gives birth to fatalities and damages, infrastructures, environment, essential services or mode of sustenance on a proportion beyond the normal capacity of the affected community. Disaster is also sometimes described as a catastrophic situation where the normal pattern of life or eco-system is disrupted and emergency interventions are required to protect lives and environment. The Disaster Management Act, 2005 defines disaster as "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 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." On 14th March, 2020, with the declaration of corona virus outbreak as a notified disaster by the Hon'ble Home Minister of India, it comes under the provisions of the Disaster Management Act. The World Health Organization defines disaster as any sudden occurrence of the events begetting damage, ecological disruption, loss of human life, deterioration of health and health services. Disaster management encompasses activities designed to govern disaster and exigency circumstances for assisting persons at risk or recover from disaster [20]. Comprehensive planning secures life and property from anticipated hazards and rehabilitates the complacent people [21]. Disaster management prepares for pre-disaster materialization as well as post-natural or human-made disaster nourishing and refashioning society. Disaster management is also termed as Emergency Management, Crisis Management, Disaster Risk Reduction, Civil Protection, etc. Actually, this concentrates on the mitigation and preparedness aspects of the emergency cycle [22]. It detects problems decisively in reference to others [23]. Basic aspects of disaster management program are: i) Disaster prevention; ii) Disaster preparedness; iii) Disaster response; iv) Disaster mitigation; v) Rehabilitation; and vi) Reconstruction [24].

Disaster- Different Types

i) Natural disasters: These cover floods, hurricanes, earthquakes and volcano eruptions having instantaneous impact on human health as well as subsequently riposting more death and victimizing from floods, earthquakes, tsunamis, typhoons, sinking ferries, etc.

ii) Environmental Emergencies: These emergencies subsume technological or industrial mishaps normally involving hazardous material. For example, wide-range forest fires.

iii) Complex Emergencies: These emergencies consider break-down of authority, looting and attacks on strategic installations, etc. Complex emergencies entail unrest situations and war.

iv) Pandemic Emergencies: These emergencies implicate sudden outbreak of contagious disease affecting health disrupting services and businesses, economic and social costs etc. For example, COVID-19.

v) Man-made Disaster: "Human-made" or "Human-induced" disasters imply disasters attributable to chemical or industrial accidents, environmental pollution, transport accidents and political unrest since they straightway influence human activities.

Causes and Effects of Disaster

Attributes behind disasters are: a) Areas prone to disaster, b) Location of residence, c) Density of population, d) Poverty, e) Global warming, f) New human settlement regions, g) Technologies, h) Industrialization, i) Corruption, etc. Tectonic plate movements, volcanic eruptions, tsunamis, etc. have escalated and many parts of the world have been touched. The Himalayan region due to drift is imbued to disasters like earthquakes and the plains below have substantiated persistent floods and drought. Location of residence is another important factor. Coastal areas are more vulnerable to cyclone. Similarly, steep slope can be more prone to landslides. Density of population also animates disasters. Varied infrastructures like electric poles, telephone poles, cable lines, old buildings, etc. are most of the time disaster prone. Poor people are more vulnerable to disaster because their disaster response is impeded by lack of resources[25]. Global warming also epitomizes disaster. New human settlements in vulnerable and hazard prone areas have led to increase in hazard risks and vulnerability in developing countries like India. Modern technologies are cultivating technological disasters very fast [26]. Industrialization has brought out development on the one side and catastrophe on the other. Gas leakage in Bhopal, India, Chernobyl Plant in Russia, COVID-19 evidence the tragedies. Corruption rears disaster. Often the needy do not get the fullest benefit because the authorities in charge of the disaster situation mostly mishandle the money. Bureaucrats and high level politicians eat out the funds and the general public is devoid of the opportunity to tackle the crisis[27]. Often, political or economic expediency takes priority over health and safety. Crucial effects of disasters are: 1) Deaths; 2) Severe injuries; 3) Risk of communicable diseases; 4) Damaging health facilities; 5) Damaging water systems; 6) Food shortage; 7) Population movements, etc. Health problems associated with every disaster are: 1) Social reactions; 2) Communicable diseases; 3) Population displacements; 4) Climatic exposure; 5) Food and nutrition; 6) Water supply and sanitation; 7) Mental health; 8) Health infrastructure, etc.

Objectives of Disaster Management

Objective of disaster management comprises pre-disaster phase like prevention, mitigation and preparedness; while post-disaster phase like response, rehabilitation, reconstruction and recovery. Although the gravity of a specific disaster varies depending on the hazard, the following four objectives pertain to every plight:

i) Reduce Damages and Deaths

Effective disaster management lessens morbidity, mortality, economic and physical damages with the help of certain techniques like hazard and vulnerability analysis, preparedness, mitigation and preventive measures, storm shelters and outdoor siren systems.

ii) Reduce Personal Suffering

Disaster management reduces personal suffering like morbidity and emotional stress by providing safe food supplies and drinking water. The techniques used to prevent suffering are hazard and vulnerability analysis, preparedness, mitigation and preventive measures.

iii) Speed Recovery

Speed recovery assimilates nurturing paperwork assistance for insurance claims and grant or loan applications. Speedy recovery is performed through effective response mechanism, recovery program and assistance.

iv) Protect Victims

Disaster management protects victims with the help of preparedness, response mechanisms, recovery programs, shelter needs and other protective services.

Importance of Disaster Management

Disaster is a calamitous event having high aftermath on humans and environment. Disaster management contrives responsibilities to grapple all humanitarian aspects of emergencies, especially, preparedness, response and recovery to lessen the consequences of disaster. Disaster impacts mental, socio-economic, political and cultural state of distressed area. Government, and community should administer disasters seriously to reduce the occurrence of disasters and its impression on inexorability. Disaster management forces become operative immediately after a disaster strikes and carries out relief, rescue and rehabilitation process by experts to minimize the loss of life and help the locals to get back normalcy. Recently, exploitation of environmental resources has changed the climatic and weather conditions resulting a chain of events globally that leaves all with little or no time to restore.

Principles of Disaster Management

Disaster management is a complex multidisciplinary approach. The Federal Emergency Management Agency of the United States Department of Homeland Security (FEMA) [28] formulated certain principles for disaster management plans viz.: a) Comprehensive; b) Progressive; c) Risk Driven; d) Integrated; e) Collaborative; f) Coordinated; g) Flexible; and h) Professional. Emergency managers should appertain sound principles like hazard identification, risk analysis and their impact analysis so that the communities can develop disaster resilience. There should be well integrated efforts to confirm coordination among individuals and organizations to grow team spirit and consensus among all units including NGOs to achieve common purpose of management. Disaster management programs should adopt scientific-based management approach, disaster education, training and experience. There should be wide scope for further improvement in management mechanism. Disaster management planning must consider past history of

extreme events and must be inter-organizational with ample exchange of communication among organizations. Disaster mitigation and preparedness plans may be adapted to wide range of circumstances[29].

Ethical principles

These generally have: (i) Solidarity; (ii) Joint responsibility; (iii) Non-discrimination; (iv) Humanity; (v) Impartiality; (vi) Neutrality; (vii) Co-operation; (viii) Territorial sovereignty; (ix) Prevention; and (x) Media.

Ethical principles (pre-disaster): (i) Preventive measures; (ii) Healthy environment; (iii) Education, training and awareness-raising; (iv) Prior information; (v) Participation; (vi) Freedom of expression; (vii) Access to justice; (viii) Participation in emergency drills; (ix) Preventive evacuation of population.

Ethical principles (during disaster): (i) Humanitarian assistance; (ii) Information and participation; (iii) Compulsory evacuation of populations; (iv) Respect of dignity; (v) Emergency assistance; (vi) Importance of rescue workers; (vii) Protection, rehabilitation and restoration of social ties and the environment.

Ethical principles (post-disaster): (i) Strengthening resilience; (ii) Protection of economic, social and cultural rights; (iii) Protection of civil and political rights; (iv) Other necessary measures.

Key Components of Disaster Management

Key components of disaster management plan entangle certain characteristics like: a) Hazard analysis, b) Hazard vulnerability analysis, c) Hazard risk analysis, etc. Hazards embrace events having embryonic to originate mishap of human life and property, social and economic disruption and environmental degradation.

Approaches to managing disaster

There are three major viewpoints to look at vulnerability. Firstly, vulnerability being natural, technology must be applied to mitigate the damages. The second view remains on the postulate that mankind itself has precipitated many predicaments strenuously to expropriate nature through modern technology. The third view emphasizes dissimilitude in social development of nations and the approach in which human geography get methodic on socio-economic extent. Disaster Management Act, + and National Disaster Management Plan, 2016 [30] are significant development in India's approach to disaster management. The Expert Group (BMTPC) asserted on developing a national policy on natural disaster and highlighted following points in their report [31]: a) Restructuring the existing policy in pre-disaster phase; b) Awareness for disaster reduction among all professionals and institutions; c) Preparedness among communities through media,

education, etc.; d) Amendments in the legislative and regulatory instruments; e) Capacity building for surveys in post-disaster status; f) Disaster resistant construction in houses and building; and g) Framing of policy instruments and generating funding support in high risk areas [32].

Global Trends in Disaster Management

- Improvement of professional standards and guidelines;
- More emphasis on preparedness and mitigation programs;
- Focus on managing risks in advance ;
- Shift from corporate donations of cash only to broader contribution including skills and resources;
- Integration of disaster preparedness into overall development objectives and programs;
- More involvement of the private sector including NGO or rapid emergency response teams and development banks.

Strategies of Disaster Management

Any strategy of disaster management needs to cling to certain principles like: i) identifying the key issues concerning the development process; ii) percolating the task for disaster risk reduction; iii) evolving fair mechanisms for provision of assistance; iv) providing transparency, participation and exchange of information; v) taking perception of local conditions and environment; vi) devising effective, flexible and sustainable strategies; vii) introducing integrated approach; viii) developing global culture for prevention; ix) adopting self-reliance policy; x) education and training; xi) strengthening human resources and material capabilities; xii) promoting community-based approach; xiii) dynamic legislation and administrative action; and xiv) involvement of every sector including NGO.

The World Conference on Disaster Reduction held in January, 2005 at Hyogo, Japan identified the strategies as: i) effective incorporation of disaster risk contemplation into sustainable development planning; ii) prevention, mitigation, preparedness and vulnerability reduction; iii) strengthening institutions, mechanisms and capacities at all levels including community level; iv) obstinacy to hazards; and v) systematic incorporation of risk reduction approach. Current disaster management approaches and strategies propagate a comprehensive approach. Holistic and proactive disaster management strategies concentrate on disaster risks; dexterous coordination among all stakeholders is indispensable for harmonizing the customary knowledge and techniques on disaster management. Another immanent approach is effective communication knowledge technique and stimulating governments for sustainable development. Flourishing

the mechanisms, procedures and supreme execution to satisfy the exigencies of the multiplying number of disasters are potent disaster management strategies in the 21st century.

Disaster Management Cycle

Disaster management cycle illustrates ongoing process by which government, business and civil society plan to reduce the impact of disaster, react during and immediately following a disaster, and take steps to recover aftermath. Appropriate actions at all points in the cycle lead to greater preparedness, better warnings, reduced vulnerability or the prevention of disasters during the next iteration of the cycle. Complete disaster management cycle includes the structure of public policies and plans to either modify the causes of disasters or mitigate their effects. The five distinct disaster management phases illustrated here do not always occur in this precise order. Often phases peregrinate and the length of each phase largely depends on the severity of disaster. Under this paradigm, major disasters distinguished into five distinct phases are (Fig.-1):



Figure-1: Disaster Management Cycle

Note: Author's own elaboration

1.Prevention:Prevention focuses on arresting the human hazard primarily from potential natural disasters or terrorist attacks. Preventive measures are designed to provide permanent protection from disasters. Natural disasters cannot be prevented, but the risk of loss of life and injury can be mitigated with good evacuation plans, environmental planning and design standards.

2.Mitigation:Mitigation activities actually eliminate the probability of disaster occurrence or the effects of unavoidable disasters. Mitigation depends on incorporation of appropriate measures in national and regional development planning. Mitigation phase

includes shaping of public policies and plans that either modify the causes of disasters or mitigate their effects.

3.Preparedness: Emergency preparedness programs aim at achieving a satisfactory level of readiness to respond to any emergency situation that strengthens the technical and managerial capacity of governments, organizations and communities. Response mechanisms and procedures, rehearsals, developing long-term and short-term strategies, public education and building early warning systems can only enhance these logistic measures.

4.Response: Emergency response provides immediate assistance to improve health and support the morale of the overwrought people. Such assistance may range from providing specific but limited help like assisting refugees with transport, temporary shelter and food in camps and other locations. Humanitarian organizations remain often present in this phase of disaster management cycle.

5.Recovery: This phase brings the distressed area back to normalcy or better as quickly as possible. There is no distinct point at which immediate relief changes into recovery and then into long-term sustainable development. During the recovery period, there may appear many opportunities to enhance prevention and increase preparedness, thus reducing vulnerability. Ideally, there should be smooth transition from recovery to on-going development.

FUTURE PATH

Traditional perceptions about disasters has undergone transformation. Disasters are no longer contemplated as occurrences to be managed through emergency response services. Disasters, natural or human induced can take place any time; what is required is awareness and sharing responsibility. Vital link between development and disaster is being increasingly felt and was in fact the main theme at the World Conference on Disaster Reduction held in Kobe, Japan in 2005. Disaster reduction and mitigation efforts must be **"woven into the fabric of a community's overall development"** noted Jan Ireland, the UN Undersecretary General for Humanitarian Affairs. Globally, all countries at present are working towards the achievement of Millennium Development Goals(MDGs).The path ahead for managing disasters is to usher in people-centered development strategy supplemented by: i)systematic assessment to tackle various adversities; ii)strengthening social capital; iii)new institutional strategies and cross-sectoral coalitions; iv)scaling up strategies based on aspirations and capacities of people at risk, etc. Strong political will, keenness and commitment can make the strategies effective. With it is required leadership and sound governance. Negative aspects mingled with disasters can be excuplated by positive aspects as exhibited below (Fig.-2):

	Negative Aspects	Positive Aspects
D I S A S T E R	Damage Interruption Severe Antagonistic Traumatic Emergency Risk	Development Innovation Sharing Awareness Transformation Education Resilience

Figure-2: Positive vs. Negative aspects Note: Author's own elaboration

Section 10(2)(i) of the Disaster Management Act, 2005 permits the National Executive Committee of India to direct the governments for taking measures. It also permits the governments to get access to the National Disaster Response Fund, State Disaster Response Fund and District Disaster Response Fund. The National Disaster Management Act outlines certain measures viz. i) prevention of threat of disaster. ii) mitigation of the risks attached to disaster. iii) building capacity to carry out the preparedness to handle disaster of any magnitude. iv) prompt response. v) assessment of severity. vi) evacuation and relief operations. vii) rehabilitation of the disaster-hit area.

RECOMMENDATIONS

1) Capitalizing disaster preparedness program on cultural aspects. 2) Removing long-standing beliefs and prejudices through education and culture. 3) Good governance in a caring and civilized society. 4) Special training for the medical, paramedical, voluntary workers, etc. 5) Coordination with civil, defence, police, fire brigade and various governmental and non-governmental bodies like Red Cross. 6) Adequate safe drinking water, basic sanitation facilities, shelter, sewerage system, etc. 7) Legislation preventing building in the flood prone areas. 8) Seismic housing code for earthquake-prone area. 9) Strict procedural code to prevent nuclear, toxicological and chemical disasters. 10) Early warning systems, and disaster preparedness to minimize morbidity, mortality and economic loss. 11) Implementing all public health measures to reduce risk of disease transmission. 12) Early clarification of the situation to prevent unnecessary dispersion of scarce resources and disruption of normal progress. 13) Identification of the areas exposed to natural hazards. xiii) Inclusion of disaster mitigation in the curricula of professional

training institutes, etc. 14) Organizing disaster simulation exercises testing response mechanisms. 15) Organizational structure in the hospital with disaster management team. 16) Standardized simple therapeutic procedures. 17) Dividing disaster-stricken area into smaller areas or "blocks". 18) Reporting by the surveying staff at specified time. 19) Ongoing preparedness in disaster management. 20) Trained and educated staff for rescue and relief operations in a systematic way. 21) Genuine efforts and commitments by all stakeholders. 22) Minimizing duplication of efforts and controlling financial resources appropriately. 23) Inter-organizational disasters management planning. 24) Sufficient communication exchange among various organizations with news media. 25) Establishing cost-effective mitigation plan. 26) Prioritizing building climate resilience in coastal places.

CONCLUSION

Disaster management purports holistic human development integrating the millennium developmental goals, policies and practices that harness people's strengths instead of vulnerabilities. Modern technology has launched a distinct era in the domain of disaster management to administer, measure, analyze and predict the possible occurrence with reference to time and geographical locations more accurately. Disasters mostly do not decrease in foreseeable future; a sustained effort minimizes risk through prevention, mitigation and preparedness measures. Lessons from previous disaster phenomenon can boost in making planning for future calamities. In the aftermath of a prodigious disaster, authorities must meet extraordinary demands of the afflicted persons. Sporadically, disaster management framework gains august political priority and commands attention among policy makers and users as they are associated with established risks.

CONCLUDING REMARKS

Disasters are inexorable. Healthy disaster management necessitates risk reduction planned investment in development planning. A more people-centric preventive approach is crucial. Government should facilitate with respective stakeholders in design and implementation of policies, and standards for disaster management. **we must all be inclined to strive to endure the current and the approaching disasters.** We cannot preponderate the nature but we can at least be watchful and wakeful. Structured and preplanned preparedness and the blooming reciprocation to disaster can safeguard the losses. Our triumph bides in, **"unity and unanimity devoid of discords"**.

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CONFLICT OF INTEREST

There is no conflict of interest with this manuscript.

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