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KEY ASPECTS OF DISASTER MANAGEMENT

Deepak Chandra Chandola [a, 1, *]

Abu Dhabi Polytechnic, deepak.chandola@outlook.com, Al Ain, Abu Dhabi, United Arab Emirates, +971-55-7772640

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Abstract

Nowadays, our planet and its existence are under strain due to several natural catastrophic events like earthquakes, tsunami, hurricanes, extreme weather changes, global warming, diminishing glaciers, and landslides. Continuous changes in the earth's ecology and its atmosphere including the troposphere and stratosphere making our habitat vulnerable to unforeseen disasters and require immediate attention. Such a situation may encounter due to the impetuous extraction of natural resources on our planet and the increasing presence of humans in space. Such activities not only leading our globe towards irreversible disastrous events but also indicating us to prepare for the worst. Therefore, all policymakers should come together and prepare sophisticated policies precisely focused on advanced methodologies of disaster management. To achieve this objective, it becomes utmost necessary to identify key aspects causing disaster and proven management techniques to handle such situations in near future. However, several integrated research and disaster prevention programs are already in place but continuous exploration in this area aligned with all possible consequences is extremely important. In recent events, COVID19 outbreak, its spread and apocalyptic nature challenged the entire world. Additionally, containment and prevention activities utilized by most of the nation indicates that long term planning and robust management skills at planetary level are key factors. To ameliorate that, this research will utilize qualitative approach using extensive literature review of research papers published on disaster management. Conclusions and suggestion given by such research paper will be carefully analyzed to drive most effective approach to handle such atrocious situations. Outcome of this study will help global leaders to better manage and prepare the world for unforeseen calamities.

1. Introduction

While we review the last 15 years' record of natural disasters and their consequences, we observed multi-billion dollar losses due to damages to infrastructure along with the death of millions of people [2]. Such pieces of evidence indicate that our planet earth is under stress which is compounded by natural hazards [2]. Recent scientific studies have highlighted a key relationship between developments and hazards, which leads to natural disasters affecting the lives of millions. Nowadays, disaster prevention is not only an issue at the national level but also an international concern and also highlighted in 2002 during a World Summit, which was focused on sustainable development. The summit emphasized an integrated, multi-hazard, inclusive approach to overcome natural disaster events and advised adopting a new approach that includes prevention, mitigation, preparedness, response, and recovery [2]. However, the recent COVID19 outbreak questioned all the strategies or inclusive approaches advised in the past because the previous experience provides limited learning opportunities and couldn't advise much on current and future disastrous events [8]. Nowadays, a significant problem that challenges a country is a vulnerability to natural disaster, which requires effective disaster management

*Corresponding Author
Email Address: deepak.chandola@outlook.com (Deepak Chandra Chandola)
[1]Instructor, Aircraft Engineering Technology – Abu Dhabi Polytechnic

techniques and such techniques shouldn't only be relying on past data but also capable to simulate future problems in a precise manner. Besides natural disasters caused due to human interference with nature, there are many other forms of threats, which need to be addressed. For instance, dangers due to asteroid collision with earth, satellites collision within earth's atmosphere and debris of accidents happen in the thermosphere. As we all aware some natural disasters like earthquakes, which mostly occur due to the movement of seismic plates. A recent study suggested that sometimes earthquakes are caused due to a natural fault distribution on the seismic section on the surface and at depth [1]. For such cases, effective planning and preparedness are needed, otherwise, we won't be able to save our people or we need to pay a heavy price for its solutions [5]. Such prices would be in any form ranging from damage to a significant portion of habitat to exposure to cosmic radiation. A detailed analysis of the present scenario suggests that preparedness is one of the effective KPIs to measure disaster management's success and is highly correlated with effective knowledge management techniques [9]. Similarly, many other aspects, which have a significant impact on disaster management, need to be evaluated and must be utilized by policymakers and position holders.

2. Effective approaches to disaster management

A review of a recently published research paper indicates that several disaster management techniques are proved to be ineffective in the case of series of complex environmental catastrophes [6]. Such catastrophes are not only caused due to natural events but also caused due to the advancement of technologies. For example, Chernobyl nuclear disaster (1986) in Ukraine, Fukushima nuclear plant issue (2011) in Japan. Therefore, effective and scientifically proven disaster management approaches are needed. A detailed review of several research papers highlighted that disaster management is mainly comprised of four main stages which include Prevention & Mitigation, Preparedness, Response and Recovery [10]. This research paper explains the above-mentioned stages in detail and highlights their dependence and correlation with other influencing factors.

2.1 Prevention and mitigation

So far it has been observed that in case of disasters, governments use the response and recovery approach, which is an old practice now and needs to be replaced by the prevention-mitigation approach. This new approach helps human societies to improve resilience and minimize risks, which can only be achieved by implementing an important habit to focus on a lesson learned from previous mistakes [2]. Effective and continuous learning help governments to embrace themselves with the required knowledge to prepare themselves in advance so that all possibilities of natural, man-made, and terrestrial disasters can be managed in effective ways. The use of the latest technological tools is an added advantage to help disaster management teams to identify the root cause of the issue and try to mitigate the risk of recurrences. Furthermore, having disaster prevention procedures in place also helps in financial saving as well as saving of human lives by not allowing disasters to occur in the first place. It is also evident that possibility to completely mitigate disasters is not very significant but its long-term effects can be suppressed by effective designing of prevention techniques. Additionally, prevention and mitigation must move side by side and each stage of this move must include a checkpoint to record mitigation decisions [5]. Therefore, at a later stage, effective recording of decisions taken during disastrous events will help other stakeholders to have clear visibility on previous disasters and response action taken to mitigate and prevent to save our future.

2.2 Preparedness

Next stage, which has a wide scope to work and needs active contribution from all including human societies, industries, and governments. During a disaster crisis, lack of preparedness may lead to irreversible consequences which can be easily avoided by careful review and implementation of an adequate and effective decision-making mechanism, such mechanism need to be proactive [5]. Disaster preparedness will help in the reduction of undue human losses and suffering and it will also help to minimize economical losses due to infrastructural damages [7]. The recent outbreak of the COVID19 pandemic provides an exceptional opportunity to all nations and their respective governments around the globe to assess disaster preparedness. In such cases, various researchers have advised adopting continuous learning and knowledge management tools to ensure disaster preparedness [10]. However, continuous

*Corresponding Author
Email Address: deepak.chandola@outlook.com (Deepak Chandra Chandola)
[1]Instructor, Aircraft Engineering Technology – Abu Dhabi Polytechnic

learning alone won't be sufficient, decision-makers must be creative and should be able to visualize future possibilities of disastrous events. A recent study on disaster management highlighted that organization with a lack of learning practices inhibits disaster preparedness, which incurred huge financial losses to such organizations and hinders organizational resilience [8]. A possible and cost-effective solution for preparedness could be tailor-made training programs, which will not only help the organization to improve work culture but also prepare organizations for future disastrous events [8]. Besides training, international cooperation and exchange of sensitive information should be able to improve the preparedness level of different organization and countries as well [9].

2.3 Response

The third and most decisive stage in disaster management in response. Effective and verified responses make a significant difference during disasters and help to minimize adverse effects. Some of the researchers advised that preparedness and response work alongside and correlate them, some of the governments are using these together in the form of preparedness and response plan (PRP) [10]. To establish an effective response plan, it is crucial to have a well-defined and detail-oriented response procedure and all stakeholders must be aware of it. However, some physiological factors may affect the effectiveness of response during the disaster [9]. Researchers also advise that situation-specific responses give better results in the business world, especially when an organization response in a productive manner during disasters [8]. In a recent historical visit of the UN Secretary-General (UNSG) to the Pacific Island region, which was widely covered by media, when UNSG applauded the Pacific Island Countries and Territories for the integrated responses to the climate change, which shows the importance of wise and effective responses [7]. Furthermore, Hyogo Framework for Action (HFA), identifies some priorities which establish the foundation to build responses [2]. To continue further, a careful review of response strategy and psychological reactions by humans suggests that behavioral studies also need while preparing a response strategy and related procedure [3]. Recent research also highlighted the negative impact of the overflow of human civilization and future possibilities of reduced human presence from the earth in its current form [4]. The same research also pointed out the reason behind dehumanization, which primarily focused on rigorous scientific expansions, consumerism, deterioration of culture, and supremacy of corporate state [4]. Which highlights toward a precisely balanced approach to the whole issue and same need to be considered while preparing or formalizing the response.

2.4 Recovery

The final stage of an effective disaster management strategy suggests that time-bound action plans for recovery and effectiveness at a bottom level have a significant impact on human society because the return to normal matters a lot and any delay may cause adverse impact in society and country as a whole. Especially, during natural disasters or disease outbreaks, the quick and efficient response may help to save millions of lives and financial disruptions as well [3]. While we discuss planetary level disasters, we must appreciate the efforts of the USA, where an interagency group already established to detect and mitigate the impact of earthbound near-earth objects (DAMIEN), and this group define, coordinate and oversee a NEO earth-impact response and provides recovery input to the National Planning Framework [5]. It indicates the significance and importance of recovery strategy to tackle disasters which includes natural, man-made, and terrestrial disasters. Effective recovery initiatives help governments as well nations to reduce human losses and suffering. It also helps to minimize economic, social, and environmental impacts which may turn worst in case of ineffective recovery plans and their execution [7]. However, it is very difficult to achieve full recovery within a short period, and it is almost impossible to achieve without an active contribution from local societies [8]. Some instances when unique disastrous situations arise, such as the COVID19 pandemic, which forced countries and even states to completely shut down their border and even restricted movements within city-regions. Such cases, which couldn't relate to past learning may need a completely innovative and creative revival plan, which needs active supports from governments. For that governments must focus on effective anticipation, response, and recovery from disaster events [9]. Researchers advised two important approaches to have effective recoveries, and these are the use of technology to create awareness, and management of resistance [10].

*Corresponding Author
Email Address: deepak.chandola@outlook.com (Deepak Chandra Chandola)
[1]Instructor, Aircraft Engineering Technology – Abu Dhabi Polytechnic

3. Discussion

Considering the current trajectory of disastrous events and significant losses incurred, it wouldn't be too of the mark if I opined that we must reconsider all our existing strategies to manage the disastrous event and it is highly recommended to establish a disaster management framework which is highly resilient, agile, sustainable and futuristic. Based on lessons learned from a previous disastrous event, researchers observed that society have is the different response for natural disaster and disease outbreak, which affect the disaster management framework in a significant manner [3]. The number of people or societies, who come forward to help and support during natural disasters is not even half in number during a disease outbreak. Such a significant drop in the number of helping hands makes it worst for government organizations to effectively manage during disasters caused due to pandemics or disease outbreaks. The main reason behind such difference is the fear of personal safety, which is indeed important for every individual [3]. However, technological tools may play a vital role during such causative events. Some of these tools are social media platforms to spread awareness about the disease and its spread, automated machines to tackle effective sanitization in an urban and rural area, and robots to handle sensitive patients during a highly spreadable disease outbreak. On the other hand, while discussing natural disasters, previous experience and international cooperation is a vital element to tackle the situation and respond most effectively. Recent research suggests that integration of disaster risk management have shown commendable results while handling natural disasters like climate change and one of the countries which have shown exceptional result is Vanuatu [7]. International communities may collaborate with exceptional performers in climate change to formulate their disaster management framework to effectively handle natural disasters. Considering several aspects of disaster management, the research highlighted three main elements which are very common in most of the previous disasters and need to be included in disaster management frameworks and these are learning, resilience, and collaboration [8]. Therefore, none of the disaster management strategy completed without considering these elements.

4. Conclusion

This study aims to identify key aspects of disaster management and concludes that it has four major aspects, which also considered the main pillars of disaster management. These are Prevention & Mitigation, Preparedness, Response, and Recovery. However, there are some associated element which is as very important to consider while establishing disaster management framework and need to be infused with each main pillar. Such vital elements are learning, resilience, and collaboration. This research also concluded that traditional learning won't be able to fulfill the requirement and needs to be equipped with later knowledge management tools (i.e. machine learning, data analysis, and artificial intelligence, etc.). Similarly, resiliency needs are aligned with agility, which is mandatory in the present time when things are moving at an unprecedented rate. Finally, collaboration among all stakeholders which include people, societies, organizations, and governments plays a key role in disaster management. This study highlighted that digital and technological advancement made information sharing very fast and feasible. Therefore, it makes collaboration easy and quick, it can also help in the quick response in the case of any disastrous event.

Declaration of competing interest

The author declares that he has no known competing financial interest or personal relationship that could have appeared to influence the work reported in this paper.

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*Corresponding Author
Email Address: deepak.chandola@outlook.com (Deepak Chandra Chandola)
[1]Instructor, Aircraft Engineering Technology – Abu Dhabi Polytechnic

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*Corresponding Author
Email Address: deepak.chandola@outlook.com (Deepak Chandra Chandola)
[1]Instructor, Aircraft Engineering Technology – Abu Dhabi Polytechnic