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Emergency management

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Abstract

Inadequate or lack of emergency management has been the sole reason why most people become vulnerable to emergencies. This has led to more suffering in the occurrence of an emergency. This paper focuses on emergency management concepts, theories, and important foundations. According to the findings, emergency management is the key to reducing the vulnerability of people in the occurrence of an emergency and therefore it is an important aspect (Canton, 2019). The tone in the procedure shows that there is still more to be done in emergency management. The project recommends emergency management concepts and theories that can be used to manage an emergency.

Introduction

Emergency is defined as a circumstance that airs an instant health risk, environment, life, or resources (Scharbach & Waldram, 2016). They, therefore, require impromptu intervention to curb the situation although in some cases that may not be possible. To intervene in an emergency, management is key. Emergency management can therefore be defined as the process of organizing and managing the resources and liabilities for all aspects of emergencies. The management process involves; the preparedness towards the emergency, mitigation measures, the response, and the recovery process. The objective of disaster management is therefore to reduce the side effects of emergencies such as hazards and disasters. According to the World Health Organization (WHO), an emergency is a state whereby the normal procedures are disrupted and quick measures are taken to stop it from becoming a tragedy, which may be difficult to handle (Callaghan, 2016).

To reduce vulnerability to hazards, contemporary approaches to emergency management have been put in place. This also helps in reducing the impact of an emergency in case of an

occurrence, also in the preparedness for any and even response towards one. Dealing with emergencies, therefore, require many resources governments alone may be overwhelmed. In the year 2014, the Ebola outbreak in West Africa was the deadliest in history. The outbreak which begun in Guinea left more than 11000 people dead this being 40% of those who were infected. Such an outbreak can't be handled by a single country government and therefore it took the intervention of the UN and WHO to manage the situation. Emergency preparedness should be a priority to any organization. This paper's goal is to review the important bases, concepts, and theories of managing emergency.

Literature review

China is one of the countries in the world that has been affected by most disasters. An example of such disasters is the earthquakes and the 2003 SARS epidemic that led to the reform of its management system (Hao & Chon, 2020). The Chinese government adopted the Emergency Response Law to reduce and curb the occurrence of emergencies. although the Chinese government has done a great job in emergency management, there's still a lot to be done. To ensure effective emergency management, many countries have been exploring whether principles like CEM are universal or are specific to different cultures. There are various other concepts, theories, and important foundations that inform emergency management practice.

The important foundations of emergency management are based on four principles; mitigation, preparedness, response, and recovery.

Preparedness involves the measures to be undertaken before the catastrophe to enable the preparedness of communities, governments, and organizations for an effective response. Emergency preparedness is important as it reduces the time required to respond to the emergency

as well as speeding up the recovery time (Merchant & Lurie, 2020). The preparedness phase involves the identification of the dangers and developing appropriate plans to address the recovery process and the response plan and all the requirements for the response plan. These plans are usually masterminds of individual agencies the major setback is that disaster management requires a partnership between agencies that in some cases may not be having good working relationships. Therefore, plans are more effective if it is done between agencies that enjoy a good working relationship. It also involves the training process whereby people are trained on how to handle emergencies such as evacuation procedures. Joint planning is important since it develops a good relationship between the agencies that will be involved in the response process.

A good example of an agency required during the preparedness process is the GIS agency. This agency helps in the identification of data requirements, development of data sets, and sharing of these data across other partnering agencies. It is also important since it helps in the location of the assets required for the response and recovery process such as medical resources and generators. They also compile metadata and make decisions about attributes to enable the responding entities are working with the same data set. Decisions should also be made in the way data should be reported in terms of the format, unit, method, etc.

Geospatial tools are also important in the geospatial phase as they can be used to help in showing the distribution of hazards and risks as they exist and how such risks may exist in the future. A good example is the Maharashtra government that plans the use of GIS in creating a digitized database on disaster management. Model of event scenarios is used either as part of exercises designed to test the preparedness of agencies or in the development of agency response

plans. Models can be used before the impact of a disaster to estimate the potential number of damages to infrastructure, fatalities, or injuries.

The response involves actions taken into account with immediate effect after a disaster strikes to provide relief to people affected by the disaster. This phase begins during the outbreak of the disaster. It is determined to slow down threats to a victim's life, provides aid thus sustaining the life of a victim, and also halts the damage process to property (Das, 2018). People under the response phase are always involved in a series of activities. Such activities include searching and rescuing those victims trapped in collapsed buildings, roofs, and under refuse, distributing basic needs such as water to the victims, providing temporary shelter to those who may have lost their homes due to floods, and controlling spillage of harmful materials to the affected places. Although the response phase begins immediately on the onset period, it is not effective to all disasters since some catastrophes do not occur suddenly because the onset of the disaster may be slow thus leading to the response phase extending over the foregoing preparedness process by including evacuating and warning the people who are at a high risk of being struck by the disaster.

Analysis of geospatial information is key to management and making of decisions during the response process. Activities during the analysis period include acquiring images, processing them, analyzing them, distributing them, and finally converting them into information products. Other GIS data must undergo collection, summary, and conversion into reports and maps. World imagery and analysis of images are important to the response phase. Maps are among the most wanted information product, maps such as those of the affected area by the disaster, the ones that cover the extent of damage caused by the disaster, the ones which locate the population affected in the affected area, and those that show the location of assets to be used during the response

phase. The products obtained during the analysis of geospatial information should be helpful which implies good quality procedures and correct metadata. During data collection, geospatial experts should be keen and attentive to reduce errors that may arise during the collection of data. This is to ensure quality products at the end of the analysis (Dixon & Uddameri,2016). Agencies have resolved to distribute compact disks and other forms of media during the response process. Damage can be estimated by the geospatial platform. Employment of dynamic versions provides guidance and improvement to the response phase. Performing all operations in the response process at the onset of the disaster may become a problem when the number of requests is large and the demand for information is high thus resulting in the production of poor-quality products which can have adverse effects on the recovery process and response operation. However, for geospatial experts to produce quality products they need operational steps which are standard, experience in exercise, and proper training during the response phase.

Mitigation is one of the important phases in emergency management. It includes activities that are undertaken over a long time after a disaster and before another disaster to avoid emergency and to lessen the damage caused by the disaster through identification and modification of dangers, assessment, and reduction of risks and other possible losses. It can be defined as a set of activities put in place to reduce the effects of future catastrophes. This process involves the implementation of new master plans and changes in policy. Such activities can be structural e.g., restructuring buildings so that they withstand strong winds and fastening of roofs, and others can be with no structure e.g., precluding development in areas that are prone to be affected by a disaster. The geospatial sector plays a role in the mitigation phase that is informing the agencies about the planning, this could be measuring and visualizing impacts of alternative plans in the mitigation phase. Those involved in planning mitigation can make decisions through

simulation models which are used in predicting dangers in the atmosphere. Analysis of geospatial information supports the importance of mitigation through comparison of changes in the cost to rough estimates of savings that occur when a disaster is mitigated.

Mitigation planning involves coming up with choices and deeds to reduce effects during a disaster. There are 4 steps involved in the creation of a mitigation plan namely:

- Organizing the process of planning – the agency should mainly focus on putting together the assets that will be needed for a mitigation process to be a success. This may include the identification of individuals and stakeholders who will take part in the mitigation process.
- Assessment of risks – the government should address the effects of the disaster on people and it should point to locations that are prone to be affected, people at risk, and resources that are vulnerable.
- Development of a mitigation master plan- the agency should prioritize and come up with strategies that will help minimize the effects of hazards. The strategy would address the implementation and administration of mitigation actions.

Adoption and implementation of the plan – once it satisfies the requirements, the agency adopts it and puts it into practice during the period of approval (Nuottila & Kujala, 2016). The recovery process is also an important aspect of disaster management. Recovery includes the processes that are carried out post the disaster to try to return the people affected and the infrastructure in the affected communities to at least their preexisting conditions before the occurrence of the disaster. Such activities than either be long-term or short-term. Short tern activities include activities such as the provision of temporary housing and finances. Long-term activities are activities such as rebuilding and renovation of the infrastructure. In the event of an

emergency in U.S, like an earthquake, or tornado, the president may take the opportunity and declares it a natural disaster thereby allowing individual assistance for the affected through the help of organizations such as DSNAP. During the recovery process, Geospatial activities are still needed as they are used to help the managers in directing the recovery process, for example in tracking the progress of renovations and repairs, locating the affected population, identifying the evacuation sites and the conditions and capacities of various hospitals if need be. The key task is done by the geospatial team also is capturing and archiving of data collected during the disaster. Along with setting out procedures that were used in collecting such data and converting them into information. They as well document the lessons that were learned during the disaster. Such data are necessary during mitigation planning and disaster process research. Disaster recovery however differs with organizations or industries, this depends on different expectations and requirements of compliance. Paul Kirvan an independent consultant, the following components are needed in the disaster recovery plan.

- The contact information of the key personnel and team involved in the disaster recovery process.
- The policy statement of the disaster recovery includes an overview of the plan and the main aims of the plan.
- A clear direction to the recovery site.
- A diagram showing the recovery site.
- A list of all the requirements for the recovery such as the software to be used.
- How to deal with the media.
- Proposed ways of dealing with legal issues and financial issues as well.
- Readily available forms for completing the plan.

Any organization needs to consider the disaster recovery plan a developing document. It needs frequent updates and reviews to ensure it is accurate and can work when needed. Such a recovery plan should be able to address any type of disaster, it should be easy to follow and be able to meet the unique organization's needs. Main elements in emergency recovery plan include:

- Creation of a disaster recovery team- this team is responsible for the maintenance, development, and implementation of the data recovery plan.
- Identification and assessment of disaster risks- this is conducted by the emergency recovery team. It assists the team in the identification of recovery strategies and the resources required.
- Specification of the backup and the procedures of offsite storage- the procedures should be able to identify what should be backed up, the frequency of backups, and their location.
- Testing and maintenance of the emergency recovery plan- the team involved in recovery should regularly update the plan so that it can accommodate technological changes and evolving risks.

Many theories have been used to inform the practice of emergency management. Emergency management theories are the ideas developed to identify complexities in emergency management and gain a better understanding, for example, how people react to disaster (Canton, 2019)

Decision theory- this is a theory of decisions. Decisions usually depend on something which is not known for example, whether something will happen or not. Emergencies are almost most times characterized by a lack of awareness or information. It is this unawareness that makes the

people vulnerable to the effects of the emergency such as disruption and even deaths. Incorrect perceptions and further wrong decision-making result in the creation of emergency-related risks. There are three phases of decision making namely, finding the reason for decision making, finding all the possible causes of action, choosing the best courses of action. The decision-making process can be divided into five steps. Identifying the problem.

- Obtain necessary information about the problem.
- Produce possible solutions.
- Evaluate the solutions.
- Select a performance strategy.

Before the rise of the coronavirus, a suggestion that all higher learning should be done remotely would probably not have been taken with seriousness. According to Johan Wenstrom, experiences from previous emergencies such as the refugee crisis of 2015 suggest that such a decision is necessary. The coronavirus pandemic, therefore, shed a light on other aspects of decision-making in case of an emergency. Such decisions are taken rapidly. Democracy is also an important aspect of the decision-making process. There is, therefore, a need to protect the decision-making bodies in case of an emergency. A good example is a Swedish parliament that reduced their MPs quorum due to the coronavirus pandemic. In summary, there are numerous reasons to have a well-thought-out decision for many emergencies in society. It is also good to learn from previous experiences.

Management theory- emergencies are problems that affect both political bodies and organizations. Some of the vulnerability towards emergencies can be corrected through good leadership and proper planning. The ability of the people mandated to manage an emergency to

get public opinion and pursue aims actively will raise the mitigation steps and hence, reduce vulnerability in case of an emergency. In emergency management, experiments are carried out. These experiments are to test the preparedness of the residents of a given area towards an emergency. Such experiments are also helpful in that they help in testing whether the experts' recommendations are realistic or they have gaps. Drills at this point are used to train the rescue teams on how to deal with emergencies. This makes experiments a key element in the management of emergencies.

Emergency management theory can therefore be defined as a development framework used in curbing emergencies in a given place. The theory comprises elements such as preparation, prevention, response, and recovery. Prevention involves the identification of the type of disaster a given area is likely to experience concerning the available facts and finding a solution to what can be done to ensure there are little or no casualties in case the emergency occurs. Prevention involves teaching people how to act in case of an emergency. Emergency management theory is therefore an effective plan and it is based on evidence. However, the adoption of this theory is still at a slow rate in many countries. Such countries are at risk of suffering tremendous losses when emergencies strike.

Systems theory- According to researchers, it is said that the political, social, cultural, economic, and organizational surroundings have a great impact on human beings directly. People are vulnerable to effects caused by a disaster, therefore, causing threats to their lives. For example, buildings are constructed and located depending on the government policies, preferences by a certain culture, the amount of salary, and the amount of population to be accommodated in a building. This may result in poor construction of buildings because not everybody is financially stable. In case of floods, such buildings are prone to collapsing causing

adverse effects not only to the people living in that house but also to people living in the nearby places of the impact area. This theory implies agencies should work in harmony so that they minimize the effects of a disaster during emergency management. There are four important elements in the systems theory namely the equipment, processes, organization, and data which work together for the proper management of the system. System theory seeks explanations and develops a hypothesis about effects that may arise after a disaster or during the onset period. The concepts of this theory include:

- System: this comprises members of the emergency management team.
- Complex system: this includes the entire individuals of an organization with their minor systems.
- Ecological system: the character of the members involved in the emergency operation.
- Feedback loop: the outcome of emergency management greatly depends on the efforts put in place by the management team.

Chaos theory- this theory precedes the systems theory. This theory states that many counterparts and processes interact to make the majority of the people vulnerable to the effects of a disaster. It is very challenging to detect the causes of a disaster since before the disaster strikes, it is usually caused by a lot of parties. To address the issues of vulnerability, it is recommended that all parties involved should be addressed at the same time. This theory helps shape the behaviors of members in an organization for a project to be successful. The management team should learn to follow the rules and policies when carrying out a certain process in emergency management to obtain positive results of a process. Practices that will be upfront should be identified to set a pace for all the members conducting management in an organization whenever a disaster occurs. Action plans should be put in place to control and guide the management team.

The managers should enforce laws within an organization to enable the members to abide by the law.

Strengths should be discovered and areas of weaknesses need to be looked into to make the management process effective (Bryson,2018). Elements that contribute to a positive attitude among members in an organization should be recognized and enable an organization to run smoothly. By doing these, the organization would meet the following aims:

- The appliance of specific equipment to reduce chaos and obtain good results.
- Confusion will be overcome by focusing on the mission, vision, and purpose of the organization.
- Reevaluation of factors that affect the organization.

Goals and objectives

This capstone paper has three goals:

- To analyze the various theories and concepts that inform the practice of emergency management.
- To find out the importance of emergency management.
- To know the shortcomings associated with poor emergency management.

Methods

The project undertaken will be a desk study. It involved the analysis of information from various sources to determine the methods and processes of emergency management. From the above discussions, there are various aspects of emergency management. These aspects are preparedness, response, recovery mitigation, and various theories of emergency management

such as the management theory, decision theory, chaos, and systems theories. The project will seek to disclose the information on today's level of preparedness towards emergency management and what should be done concerning it. All the issues will be addressed independently. Finally, a conclusion will be made on whether the efforts towards emergency management so far enacted are enough. In the conclusion part, recommendations will be made to the government agencies and NGOs on what can be done to ensure there is proper emergency management.

Research finding

From the questions in the introduction and the literature review discussed in-depth above, it is clear that various approaches can be used in emergency management. Despite that fact, there is still a lot to be done concerning emergency management. From the discussion above, research has shown that for disaster management to succeed, it results basically from the emergency organizations. It has also shown that there are management problems that result in poor communication, authority exercise, and good coordination. There are five areas involved in the communication process, organization to organization communication, and organization to the public, and the public to organization communications. These aspects are important at different levels of emergency management. During the preparation process, there should be good communication between organizations to come up with plans that can be used to prevent the emergency or even reduce the number of fatalities in case of an emergency. In the response plan, according to the research, it is important to have good communication from the organizations responsible to the people likely to be affected by the emergency. This helps during the evacuation process in an occurrence of a catastrophe. Decision-making is found to be a key issue in disaster management. Good decisions have to be made. Decisions are made in

determining the best course of action to be taken during an emergency. Decision-making is a procedural process that must be followed later. Emergency management follows a continuous cycle with procedures dependent on each other.

Below is an example of an emergency management cycle.

To conclude, coming up with plans in emergency management is not key in curbing the effects caused by a disaster since involving the community is the most effective means to use in the emergency management process. The goal of the management is not how the response phase will react but the core goal is to manage risks in a disaster (Torabi &, Sahebjamnia, 2016). Programs scheduled by the management team provide a technique for assessment of risks, development, and implementation of strategies whose objective is to curb or reduce risks and to safeguard the community from emergencies that may occur. Response to programs put in place by the management team greatly depends on the management processes which include preparedness, recovery, response, and mitigation, and also the unity of effective organizations to deal with the risks. This results in improvement and solutions of problems in a creative manner. For a response to be successful, the management team needs to put into consideration the skills of their professional experts. The management team should come up with plans that ensure

response, security, and continuity. The team should value the community and focus on the future of the community. This implies that plans developed by the management team should be community-based. So, managers should assemble stakeholders and monitor the mitigation, response, recovery, and preparedness strategies that suggest good leadership.

The use of information technology is recommended to enhance the emergency management process. This will enable the team to know the total losses they will incur and also the costs they will undergo to carry the phases in emergency management. This will enable proper management of resources during the phases. IT informs people about the realities of the disaster in a clear manner and also helps them in decision making (Madsen & O'Mullan, 2016). The organization is also recommended to carry a lot of research to put in place the measures in a proper manner for effective results. This can be employed by engaging the public fully and aware of society.

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