

# Disaster Preparedness in Universities

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**Abstract-** Although the awareness of disasters has increased among some parts of society, the concept of disaster preparedness and response has not been sufficiently explored in universities. The aim of this paper is to assess the perceptions of students and staff regarding disaster preparedness as well as to examine whether universities are prepared for disasters or not. In addition, this article provides a brief overview of major disasters that happened to universities in the past years in order to analyse the implications of disasters to universities. Furthermore, the stakeholders involved in disaster management are mentioned here followed by a general plan and recommendations for universities to be considered in their roles toward building a resistant university.

**Keywords** - The Awareness of Disasters, Disaster Preparedness, Disaster Management, Resistant University.

## I. INTRODUCTION

At colleges and universities across the nation, millions of bright young minds regularly bask in a safe environment of learning and personal. But even though they are a sanctuary for education, colleges and universities are just as vulnerable to disasters as anywhere else. Hurricanes, earthquakes and other disasters can halt classes, disrupt campus life, damage buildings and leave students stranded with nowhere to go. Luckily, this is where planning and preparation come in.

In the last decade, disasters have affected university and college campuses with disturbing frequency, sometimes causing death and injury, but always imposing monetary losses and disruption of the institution's teaching, research, and public service. Damage to buildings and infrastructure and interruption to the institutional mission result in significant losses that can be measured by faculty and student departures, decreases in research funding, and increases in insurance premiums. These losses could have been substantially reduced or eliminated through comprehensive pre-disaster planning and mitigation actions.

Now more than ever before, university and college students are recognizing the need to be better prepared for disasters. Students are becoming aware of the risks associated with emergencies either by experience or by having seen them in the media. They have realized that disasters can damage homes, schools, businesses and ultimately cause long term damage to our countries' economies.

When disaster strikes, it is not just academic staff and students who are mobilized but also the university's alumni in

all walks of life. The university made good use of having a direct line to alumni politicians, to cut through bureaucracy during a severe emergency.

Universities will be affected by natural disaster. Although this is the prevailing situations, yet the level of awareness and preparedness in meeting these disasters is still uncertain. However, in order to answer the question whether universities are prepared for disaster or not, there are some other questions in mind which are important to be answered such as - what is the state of readiness of individuals and organizations to manage disaster? Do we at the University are ready to face disaster situations if it occurs at our door steps? What if the incident happens during the school day? If it's a biological or chemical event, do our guys know how to shut down the air units? What are we doing if students have to stay overnight or beyond the normal dismissal time? Can we feed them? Do we need power to feed the students, or are there things we can feed them cold? Are staff members well trained to deal with such a situation? How are we going to communicate with the parents and district? What if cell phones don't work and land lines are down? Do we have a back-up system we can use?"

## II. LITERATURE REVIEW

Clearly, there are too many definitions for the word Disaster. According to the virtual university in Canada, it means "a natural or human-caused event which causes intensive negative impacts on people, goods, services and/or the environment, exceeding the affected community's capability to respond" [3].

Without any doubts, when the word disaster is mentioned, the first thing comes to a human mind is how to manage it? Here comes the process of disaster management which can be defined according to The International Federation of Red Cross and Red Crescent Societies (IFRC) as the organization and management of resources and responsibilities for dealing with all humanitarian aspects of emergencies, in particular preparedness, response, and recovery in order to lessen the impact of disasters [8].

Disaster management usually refers to the management of natural catastrophes such as fire, flooding, or earthquakes. Related techniques include crisis management, contingency management, and risk management. It involves preparing for a disaster before it happens, disaster response (e.g. emergency evacuation), as well as supporting, and rebuilding society after natural or human-made disasters have occurred.

According to [1], the first step in creating a disaster-resistant university is for college administrators to identify specific hazards that could affect their school and students. Among the possibilities outlined in a recent FEMA preparedness guide that schools of higher learning should prepare for are earthquakes, fires, floods, winds and tornadoes. Officials should evaluate how ready they are for each type of disaster and take action to be prepared. For example, schools that are vulnerable to earthquakes should think about strengthening floors and walls, while those at risk for hurricanes should reinforce window glass and frames.

A Disaster Resistant University is committed to becoming resilient in a selected period of time. Resilience is characterized by structures that meet life safety standards, an emergency response that will rescue those in danger and minimize additional damage, and limited interruption to teaching and research. Each campus will vary in its definition of acceptable losses and interruption because these decisions depend on the community, the nature of the hazard and available resources.

A Disaster Resistant University will commit to changing policies and practices to reduce its potential losses and manage its ongoing risk. It will also promise to involve government, private utilities, and businesses in its loss reduction and risk management.

According to an online survey sent an to more than 450 members on the Disaster Resilient University, 13 percent of the 160 respondents said they were confident that their universities qualified as disaster resilient, and about 18 percent said they agreed that their universities qualified as disaster resilient. Nearly 75 percent of survey respondents said they had significant support from university leadership [7].

In another survey conducted in Malaysia [6], a total of 95 respondents comprising of 38 students and 57 staffs from the various university and colleges were chosen where the objectives are to examine the disaster preparedness of the universities, individual preparedness and disaster preparedness among student's and staff's in Institution of Higher Learning.

It is found that both the students and staff have different in opinion with regard to the questions of their preparedness in managing disaster. This was based on the finding output which shows that the Mean Student = 2.11 while Mean Staff = 1.96. This indicates that the staff's and students are not aware of the disaster preparedness.

Regarding the university's preparedness towards disaster management, the respondents seem to be giving an unclear opinion whether the university is well prepared for disaster preparedness. It is based on the T-Test which indicate P-Value = 0.728. This indicates that the respondents consider that their organizations are not geared up towards managing disaster.

To provide a deeper understanding of the potential disasters that may happen to universities, below is a quick review of major disasters in the past ten years reveals the many hazards to which universities are vulnerable:

#### *A. Japan Earthquake*

The Great East Japan Earthquake was a magnitude 9.0 undersea megathrust earthquake off the coast of Japan that occurred on March 11, 2011. The earthquake triggered massive tsunami waves that reached heights of up to 40.1 m (132 ft) in Iwate Prefecture, and in the Sendai area travelled up to 6 km (4 mi) inland [9].

The campus was severely damaged. Through quick inspection of 588 campus buildings, 28 buildings were not safe for occupancy, and needed some structural and non-structural retrofitting. Among the 28 buildings, three severely damaged buildings are completely under reconstruction now. A rough estimate of the total cost of damage to buildings is about ¥30 billion yen (US\$285 million) and that to facilities is about ¥24.5 billion (US\$233 million). In the immediate aftermath, all those connected with the university came together to work toward the early restoration of damaged buildings and facilities, and the swift resumption of the university's functions.

Tohoku University has established the International Research Institute of Disaster Science (IRIDeS) as a new integrated interdisciplinary research team that will use the region's experience in addressing low-frequency megadisasters that go beyond the scope of traditional disaster prevention plans. IRIDeS is Tohoku University's first new research institute in 70 years, and was founded barely a year after the 2011 Great East Japan Earthquake.

Below are other examples of disasters that happened to some universities:

#### *B. Loma Prieta earthquake*

The 1989 Loma Prieta earthquake damaged a number of buildings at Stanford University, closing 11 of them. After spending about \$300 million over ten years on repairs and retrofits, Stanford has finally reopened most buildings.

#### *C. Hurricane Andrew*

In 1992, Hurricane Andrew caused \$17 million in damage to the University of Miami. The school was compelled to close for almost one month because there was no water or electricity, and to purchase round trip tickets to send students home in the hiatus. Insurance premiums went up dramatically after the disaster.

#### *D. Northridge earthquake*

The January, 1994, Northridge earthquake damaged three universities in the Los Angeles area. California State University, Northridge suffered the most: nearly all of its buildings were damaged and the university was forced to close for one month. It was able to reopen to its 30,000 students with 450 temporary trailers serving as the only classrooms. Damages are currently set at \$380 million. Six

years later CSUN still does not have one usable science laboratory.

#### *E. the Red River*

In April, 1997, the Red River of the North inundated the University of North Dakota. It was forced to relocate critical functions such as the computer centre, send students home and close. After one month of inspection, clean-up efforts, and repairs, UND reopened. The damages have so far totalled \$46 million.

#### *F. Colorado State University Flooding*

Just three months later, in July, 1997, the Colorado State University campus was flooded by a local creek; water poured into both the library and the bookstore, damaging hundreds of thousands of books and other valuable documents. Most of the campus was closed for a week or two while clean-up was underway. Damages exceeded \$100 million.

#### *G. Hurricane Georges*

At Tulane University in New Orleans, Hurricane Georges prompted the closure and evacuation of the campus in 1998. Ultimately, the hurricane did not hit New Orleans, but Tulane's risk management practices dictate early evacuations to protect the university community's safety.

#### *H. Hurricane Floyd*

In September, 1999, Hurricane Floyd pounded ashore in North Carolina. Causing serious flooding at East Carolina University in Greenville. The campus was surrounded by water for weeks and could conduct only part of its classes and other activities. Some students had to lodge with residents in the town.

### III. WHO IS RESPONSIBLE?

Clearly, the Community involvement is the key. Building a resilient university with appropriate coping mechanisms is the basic principle behind any successful disaster management plan. And the other stakeholders are like the Local Government and other competent authorities like National disaster Management Authority; Volunteer Groups; the Financing Institutions; private/business ; the media; Red Cross society; hospitals and fire Fighting and other services; academic community. Timeliness is the essence and how quickly these stakeholders act and work together is important ultimately. Each stakeholder has his/her own responsibility in different phases of Disasters.

Furthermore, in each university, there should be one person appointed by the campus chancellor or president to be responsible for the assessment effort. This person should be a high-level administrator who commands respect, particularly among faculty, and can inspire the cooperation of others with experience or data relevant to the issue. In addition to faculty, this may include graduate and upper division students under

the guidance of faculty. Additionally, campus administrative staff responsible for planning, facilities management, risk management or emergency response will have much to contribute to the initial work. Below are the parties involved in the disaster management process in universities:

- Faculty
- Staff
- Students
- Government
- Alumni
- Hospitals and Health Care
- Non-profit Organizations

### IV. IMPACTS OF DISASTERS ON UNIVERSITIES

The university can be affected in various ways by each hazard event. Although damages to buildings and costs of repairs are important, also include initial estimates of potential failed experiments, lost administrative and research data, damaged libraries and collections, damaged computer and communications systems, loss of historically or architecturally important structures, and of injuries to students, faculty and staff,. Take into account the disruption to teaching and research while repairs are underway, faculty flight, inability to attract new students, and income losses.

In addition, many of the losses in any disaster are to contents, furnishings, and the electrical and mechanical systems in buildings. These include laboratory animals, library and other collections, laboratory equipment and systems, computer and communications equipment, irreplaceable specimens.

### V. COMPREHENSIVE EMERGENCY MANAGEMENT PLAN (CEMP)

It is recommended that universities should develop an emergency plan which provides the following essentials elements to cope with any disaster [4]:

- Action steps that give campus officials the roadmap of what to do depending on a crisis,
- The scope of the plan that explains the roles and responsibilities of staff and students at different stages
- Communication methods including a communications centre that will ensure effective information exchange;
- Redundancy of critical staff to make sure staff is available in disasters;
- Clarified media responsibilities to avoid misinformation
- Clarified roles for campus security and outside agencies
- Addressing the needs of vulnerable populations such as special needs populations that might have certain disabilities or might experience language barriers.

### VI. RECOMMENDATIONS

Besides the above recommended disaster plan, the following general steps are recommended to enhance the general awareness of disaster management in universities:

- Universities should propagate awareness towards disaster preparedness and management through seminars (out-reach), workshop (in-reach) and mentor-mentee programs together with the students and staff.
- The government ought to intensify its drive towards all work of life so as to increase the public awareness on disaster preparedness through campaign.
- Establish a disaster management system to help universities to mitigate any risk.
- Provide comprehensive training and courses to widen the knowledge of managing disasters and to teach people how to response to such events.

## VII. CONCLUSION

The public's response to any emergency is based on the understanding of the nature of the emergency, the potential hazards, the likely response of emergency services needed and the knowledge of individuals and groups in handling the matter in order to increase their chances of survival and recovery.

For universities, the protection of the life and safety of students, faculty and staff should be a top priority. It is important to ensure the sustained operation of the campus. As one of the region's largest job centers, and an important research and educational center for the nation, it is very important for the campus to continue business if a major quake strikes.

The potential contributions of universities span all phases of the disaster cycle and can cover an extremely wide range of pre-/post-disaster activities. Through the mentioned examples of disasters that happened in some universities, it can clearly be concluded that a university plays multiple roles in the disaster response and recovery process, since it has comprehensive capabilities by nature. In addition for that, there is a need for the government in general and the universities in particular to increase awareness (students, staffs of the universities) towards preparedness in managing the disasters through education programs. However, universities are not fully prepared yet for disasters and need more efforts in this field. They also should go much further, playing a central role in all phases of the disaster recovery continuum.

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