Australian Earthquake Engineering Society 2012 Conference, Dec 7-9, Gold Coast, Qld

Planning for Better Management of Crises and Enhancement of Response Capability: Focused on Iran and Australia

Mehdi Mohammad Pour Lima[1], Jeung-Hwan Doh[1], Ayyoob Sharifi[2]

[1]*Griffith School of Engineering, Griffith University, Gold Coast Campus, Queensland 4222, Australia*
[2]*Department of Environmental Engineering and Architecture, Graduate School of Environmental Studies, Nagoya University*

*Corresponding author's Email: mehdi.mohammadpourlima@griffithuni.edu.au

Abstract

Every year, numerous natural, man-made, and social disasters occur in the world. Throughout human history, crisis has been an inherent part of human existence. All human beings experience crisis, uncertainty, and environmental threats. Even though a society might initially appear to be safe, the potential for crisis does exist. Most nations in the world have been affected by numerous crises, such as earthquakes, hurricanes, floods, chemical spills, collapsing buildings, and so on.

Crises scramble plans, interrupt continuities, and brutally paralyze normal governmental operations and human lives. Society would pay a heavy price during times of crisis if there was not an organization prepared to deal with such an event. This is why more people demand that the government, which is responsible for protecting the life and safety of citizens, prepare to respond to crisis proactively and effectively. Crises tend to encourage policy change in a number of ways, although the specific dynamics may vary from one crisis situation to another.

Crisis management or resolution requires strategic thinking of contingencies. Crises also develop opportunities, which must be explored through mobilization of assets and forces available. Disaster affects different countries differently. In Australia the major flood in 2011 had a significant effect on people's life. It caused catastrophic damages to lifelines and infrastructures.

During its long history, Iran has experienced a number of tragic disasters. Some of recent disasters include eight years of imposed war of Iraq against Iran, the Manjil and Roodbar earthquake, the Bam earthquake, the agricultural damages due to severe droughts, flood crisis in some parts of country and so on. The massive death toll and property damage caused by these disasters could have been reduced substantially if the government had been more prepared and better organized actions had been taken.

Some Crises can be managed successfully while others lead to failures and further disasters. Some lead to new and positive changes in society, while others lead to further calamities. This paper gives a comprehensive definition of various kinds of crises and discusses processes leading to a better management of contingent crises that in turn can significantly decrease the amount of damages and sufferings.

Key words: Crisis management, Natural disaster, Environmental threats, Planning.

1. Introduction

In Australia and in 2011, Queensland was inundated by the worst flood since 1974 and major flooding occurred throughout most of the Brisbane River catchment. The city of Brisbane is located on a flood plain [Robin et al 2011]. Flood waters affected more than 70 communities and 75% of the State was declared a natural disaster area, lives were lost and thousands of homes were demolished [Kendall 2011].
. The crisis is different in other countries. Iran is a disaster-prone area. It has, since time immemorial, experienced natural calamities of immense magnitude, leaving in their wake death, destruction, and misery-with profound implications for human welfare, the environment, and the management of relief and rehabilitation.
Throughout human history, crisis has been an inherent part of human existence. All human beings experience crisis, uncertainty, and environmental threats. Even though a society might initially appear to be safe, the potential for crisis does exist. It is necessary to recognize that crisis is a subjective concept: what is considered as a crisis for one party may not be a crisis for another, as crises are part of human life. It is, therefore, no surprise to discover that various definitions of *crisis* exist (Kim and Lee, 2001) . Pauchant and Mitroff (1992 as quoted in Ritchie, 2004) believe that a crisis is a ‘‘disruption that physically affects a system as a whole and threatens its basic assumptions, its subjective sense of self, its existential core. Faulkner (2001) considers the principal distinction between what can be termed a ‘crisis’ and a ‘disaster’ to be the extent to which the situation is attributable to the organization itself, or can be described as originating from outside the organization. Thus, a ‘crisis’ describes a situation ‘‘where the root cause of an event is, to some extent, self-inflicted through such problems as inept management structures and practices or a failure to adapt to change’’, while a ‘‘disaster can be defined as ‘‘where an enterprise…is confronted with sudden unpredictable catastrophic changes over which it has little control’’ .
Crises can range, according to Coombs (1999 as quoted in Ritchie, 2004) from small-scale organizational issues ranging from staff illness, staff challenges/breakdowns, malevolence and organizational misdeeds to external factors such as natural disasters (earthquakes, floods and fires) and terrorist incidents.
Crises come in a variety of kinds: economic-technological crisis (Architectural collapses, flammable chemical explosions, radioactive or toxic technological chemical spills, and progressive environmental pollution); political crisis (War, armed strife, coup d’état, terror, subversive activities, hijacking); natural-environmental crisis (Flood, typhoon, earthquake, drought, cold-weather damage, storm) ; organizational and leadership crises causing severe decline and death (Farazmand ,1996; Kim and Lee, 2001) ;and social (Rioting, disease, violent labor strike)(Kim and Lee, 2001) . However, for the purposes of this paper focus will be made on large-scale crises or disasters that have the ability to cause the most damage to destinations and organizations.
Society would pay a heavy price during times of crisis if there was not an organization prepared to deal with such an event. This is why more people demand that the government, which is responsible for protecting the life and safety of citizens, prepare to respond to crisis proactively and effectively (Kim and Lee, 2001).
Crises involve events and processes that carry severe threat, uncertainty, an unknown outcome, and urgency. Crises scramble plans, interrupt continuities, and brutally paralyze

normal governmental operations and human lives. Most crises have trigger points so critical as to leave historical marks on nations, groups, and individual lives (Farazmand, 2001). A central feature of all crises is a sense of urgency, and in many cases urgency becomes the most compelling crisis characteristic. Situations change so dramatically and so rapidly that no one seems to be able to predict the chain of events or the possible outcomes (Farazmand, 2001).

With crises occurring every day throughout the world, there is a growing interest and urgency in studying them and preparing for their devastating consequences. This need is more evident in the public sector owing to its commitment to and responsibility for the protection of the lives and property of its citizens (Kalantari, 2001). Some crises can be managed successfully while others lead to failures and further disasters. Some lead to new and positive changes in society, while others lead to further calamities (Farazmand, 2001).

Crisis management entails a number of activities that range from adequate planning and preparation to subsequent support and mitigation (Huque, 2001).In this paper we discuss five related disciplines of crisis management ; namely, mitigation, preparedness, communication, response, and recovery.

2. Mitigation

‘‘Disaster reduction involves measures designed to avoid (prevention) or limit (mitigation and preparedness) the adverse impact of natural hazards and related environmental and technological disasters’’ (Stanganelli, 2008). *Mitigation* is defined as a sustained action to reduce or eliminate risk to people and property from hazards and their effects (Haddow and Bullock, 2006).

The function of mitigation differs from the other emergency management disciplines because it looks at long-term solutions to reducing risk as opposed to preparedness for hazards, the immediate response to a hazard, or the short-term recovery from a hazard event. Most practitioners agree that the primary intent of mitigation is to ensure that fewer communities and individuals become victims of disasters. The goal of mitigation is to create economically secure, socially stable, better built, and more environmentally sound communities that are out of harm’s way.

Mitigation is the cornerstone of emergency management. It’s the ongoing effort to lessen the impact disasters have on people and property. Mitigation involves keeping homes away from floodplains, engineering bridges to withstand earthquakes, creating and enforcing effective building codes to protect property from hurricanes—and more.

The following widely accepted mitigation tools are used to reduce risk:

- Hazard identification and mapping
- Design and construction applications
- Land-use planning
- Financial incentives
- Insurance
- Structural controls (Haddow and Bullock, 2006).

A total fulfillment of prevention, with a complete removal of hazards is unrealistic. A more practical path should thus involve risk mitigation in attempts to reduce key aspects of vulnerability (Stanganelli, 2008).

3. Preparedness

The main element in crisis management is preparation and planning (Kalantari, 2001). Preparedness should be considered a key part of mitigation measures (Stanganelli, 2008). Preparedness within the field of emergency management can best be defined as a state of readiness to respond to a disaster, crisis, or any other type of emergency situation. Preparedness is not only a state of readiness, but also a theme throughout most aspects of emergency management (Haddow and Bullock, 2006).

The impact of a disaster can be considerably contained with a high level of preparedness and an effective plan. There are differences of opinion on this issue. On the one hand, disasters cannot be prevented; therefore planning cannot be effective in warding them off. On the other hand, it can be said that numerous deaths and injuries can be related to deficiencies in or the lack of an emergency plan (Huque, 2001).

All organizations in private, public, and government sectors are susceptible to the consequences of a disaster and must consider preparedness (Haddow and Bullock, 2006).

Preparedness deals with the functional aspects of emergency management such as the response to and recovery from a disaster, whereas mitigation attempts to lesson these effects through pre-disaster actions—as simple as striving to create "disaster resistant" communities (Haddow and Bullock, 2006). Haddow and Bullock (2006), state that a systematic approach must be established for emergency management as a whole, and specifically the steps necessary to reach preparedness. They have presented a diagram to depict the preparedness planning cycle. Here we discuss this cycle that is presented in figure 1. The diagram depicts the planning process, beginning with assessing the threats to a jurisdiction or business, be it natural or manmade, and working in a systematic approach toward a cyclical process to establish preparedness. This systematic and cyclical approach is defined by the continual evolution of the phases on the exterior ring—assessment, planning, preparation, and evaluation.

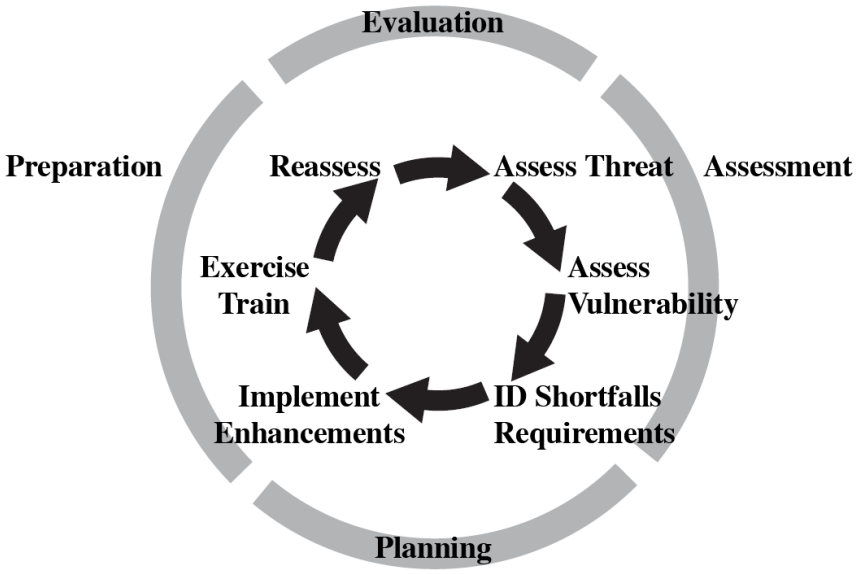

Figure .1 preparedness planning cycle (Haddow and Bullock, 2006)

In this depiction, the interior ring defines each of the steps that organizations must work toward in order to be prepared. The first step is to identify what types of disasters, or threats, a jurisdiction, business, or any entity faces. Next, assessing the current vulnerability, or level of preparedness, will lead toward determining the shortfalls between current preparedness and the requirements to meet an improved preparedness posture. Implementing enhancements or revamping complete systems then bridges these identified shortfalls. Exercises and training can then be used to test whether the enhancements or new systems are, in fact, meeting the standards determined in earlier stages. If they are, then the end goal of readiness or preparedness regarding a particular threat is met. In summary as Pinkowski (2001) states: Preparing for crisis and emergency management requires preplanning and anticipating needs in many forms. Typically it focuses on needs assessment in terms of training personnel, evaluating hazards, and securing equipment. It also includes encouraging preventive measures to reduce the dangers that would necessitate an emergency response.

The important realization that preparedness is a dynamic state and can either improve or diminish in a short time must be understood by the emergency management professional.

Using the systems approach will ensure that an overall emergency management system is prepared, but more important, each of the individual functional areas are also prepared (Haddow and Bullock, 2006).

4. Communication

Communications has become an increasingly critical function in emergency management.

The dissemination of timely and accurate information to the general public, elected and community officials, and the media plays a major role in the effective management of disaster response and recovery activities. Communicating preparedness, prevention, and mitigation information promotes actions that reduce the risk of future disasters (Haddow and Bullock, 2006). Adequate communications provide timely information about the progress of the disaster and about the current state of local efforts (weick, 1985). Stehr(2001), assert that a community with a high degree of horizontal integration is characterized by a tightly knit social network with relatively equal power distributions and features frequent, sustained interactions and communications. Conversely, communities with a low degree of horizontal integration have a weakly knit social fabric. Due to the importance of communications, Channels of communication must always be available and open to those who have information at the time of crisis.

The objective of communicating preparedness and mitigation messages to the public is to educate, inform, raise awareness, and promote support for taking action before a disaster strikes.

The provision of timely and accurate information directly to the public and to the media is critical to the success of any response and recovery effort. An effective communications strategy allows emergency managers and community officials at all levels of government to provide information and comfort to disaster victims and, at the same time, to manage expectations. Regular communications with the public and the media helps ensure that accurate information is being disseminated and reduces the chances for misinformation and rumors. Monitoring direct communications with victims and media reports helps identify

potential problems with misinformation and rumors and allows emergency officials to address these issues before they become too widespread and damaging (Haddow and Bullock, 2006). Risk communication and public awareness programs can be undertaken in the wake of disasters or during times of normalcy.

5. Response

Response is reactive phase, or action taken after the emergency has occurred. Response is the actual activation of disaster plans to meet an emergency (Carroll, 2001).
The success of a community's emergency planning attempts will be determined by a whole range of different factors, including the extent of inter-governmental co-operation; the emphasis placed on co-ordinated and planned action; early and continued support by local officials empowered for action; and the implementation of visible, cost effective strategies by capable personnel (Cigler, 1987 as quoted in Williams et al., 2000). However, of central importance to the effective emergency management of a disaster is the quality and extent of a community's management resource capacity, and the ability of a community to effectively harness, or mobilize, its resource capacity to maximum effect (Williams et al., 2000).
In the case of crisis, there must be an effective management body to organize and orchestrate all available forces (e.g. local police, fire, and emergency medical personnel, volunteer groups, government forces…).A disaster response depends on tight and effective coordination between many different public and private organizations. For example, citizen self-organizing rescue efforts, ambulance companies, law enforcement, hospitals, pharmaceutical supply houses, surface and air transport, military forces, and local government agencies may be included in any disaster response (Koehler et al., 2001).
Disaster managers should be trained in skills that increase their ability to adapt to changing situations and empower them to response the crisis more efficiently.
The never-ending problem facing anyone attempting to develop an emergency response is that every emergency is somewhat unique and will involve a certain degree of ad hoc organizing, mission learning, and, inevitably, mistakes (Schroeder et al., 2001).
Responding to disaster events is the most visible activity that any central or local emergency management agency conducts. The politicians, the media, and the general public rate the success of an emergency management organization by how well it functions in the response phase of a disaster. A successful disaster response at any level of government requires a strong command and control system, clear lines of communication, and coordination of numerous agencies from multiple jurisdictions (Haddow and Bullock, 2006).

6. Recovery

There is often a theoretical debate over when the response function ends and the recovery function begins (Haddow and Bullock, 2006). The important differences between the response and recovery periods related to intergovernmental and inter-organizational behavior are the specific agencies and groups participating, the character of tasks

undertaken, and the higher potential for goal conflict as the immediate crisis abates (Stehr, 2001).

Recovery involves decisions and actions relative to rebuilding homes, replacing property, resuming employment, restoring businesses, and permanently repairing and rebuilding infrastructure.

The recovery process requires balancing the more immediate need to return the community to normalcy with the longer-term goal of reducing future vulnerability. The recovery process can provide individuals and communities with opportunities to become more economically secure and improve the overall safety and quality of life (Haddow and Bullock, 2006).

Participation of all stakeholders is a vital aspect of recovery phase, as Haddow and Bullock (2006) assert, the goal of an effective recovery is to bring all the players together to plan, finance, and implement a recovery strategy that will rebuild the disaster-affected area safer and more secure as quickly as possible.

The research findings on natural disasters indicate that a number of factors may influence the speed and effectiveness of community recovery. Some are specific to the disaster, such the size of the event and the scope of the damage. Others are related to antecedent conditions, including the availability of economic resources. From a practical standpoint, successful recovery from large-scale disasters is problematic for a variety of reasons. One set of problems relate to timing issues. Recovery decisions are often driven by pressures to rebuild quickly, and to ‘‘return to normal’’; this means that community safety or improvement goals such as modifying land use, retrofitting damaged buildings, creating new open space, or widening existing streets are often compromised or abandoned (Berke and Beatley 1992). At the end of this section, we mention the tools and policy areas that Haddow and Bullock (2006) advise to be considered by decision makers as they develop their recovery plan:

- *Land-use planning techniques*, including acquisition, easements, annexation, stormwater management, and environmental reviews
- *Zoning*, including special-use permits, historic preservation, setbacks, density controls, wetlands protection, floodplain, and coastal zone management
- *Building codes*, including design controls, design review, height and type, and special study areas (soil stability ratings)
- *Financial*, including special districts, tax exemptions, special bonds, development rights, property transfer, or use change fees
- *Information and oversight*, including public awareness and education, regional approaches and agreements, global information systems, town hall meetings, and public hearings

7. Discussion and conclusion

Worldwide, disasters are becoming more frequent, more serious, and more deadly. In less developed countries in particular, growing populations and economic pressures are pushing increasing numbers of people to live in more hazardous locations, usually major urban centers (Durham and Suiter 1991as quoted in Kim and Lee, 2001)

In the above sections, we discussed the main disciplines of crisis management briefly. Although this brief description cannot be a comprehensive guide for planners and others who engage crisis management, but with no doubt it can be helpful for them in managing impending crises.

Key to crisis management is an accurate and timely diagnosis of the criticality of the problems and the dynamics of events that ensue. This requires knowledge, skills, courageous leadership full of risk-taking ability, and vigilance. Successful crisis management also requires motivation, a sense of urgency, commitment, and creative thinking with a long-term strategic vision. In Australia and after flood in 2011, Queensland Floods Commission of Inquiry [QFCI] published reports which contained many recommendations for each section of society for preparedness and prevention of the same crises that occurred in Queensland during flood 2011. Some of these recommendations are useful for other countries such as addressing local risks and circumstances before a disaster occur or use some prepared SMS alert. The public education was considered as important factor in preparedness in that report.

Iran had gone through many crises since the revolutionary crisis of the 1978–79, including especially the 8-year-old defensive war against Iraq, and a degree of preparedness, coordination, and decision structure had already been developed in Iran both organizationally and politically (Farazmand, 2001). Locating in a geographical region that is always threatened by various crises, Iran is not a safe country regarding impending disasters. Therefore planners and policy makers must have enough degree of preparedness and develop plans to confront these threats. During the short history of modern planning in Iran, one of its main problems has been the centralized system of decision making. The crisis management literature points to a more centralized decision structure (Farazmand, 2001, Dogan and Higley 1996).This characteristic of planning in Iran could also be another positive point and facilitate better management of crisis.

At the end we mention some points that can help the crisis management in Iran be conducted in a better way:

- Improved education and training of the risk managers needs a more effective approach to risk management. There is an urgent need for special programs directly regarding crisis management to be added to Iranian university programs. Also it is better to include crisis management courses in other related programs curriculum.
- Supervising and managing risk requires interdisciplinary skills, and the understanding of complex physical and social systems. Training experts with greater comprehension of such process should be one of the main objectives in crisis management.
- Policies should involve less bureaucracy when coordinating risk management activities.
- Community participation is a central component in any effective crisis management program, and it should be fully incorporated in all phases of crisis management.

References

1- Berke, P. R. and Beatley, T. (1992). *Planning for Earthquakes: Risk, Politics, and Policy*. Baltimore, MD: Johns Hopkins Press.
2- Carroll, J. (2001). Emergency management on a grand scale: A bureaucrat's analysis. In: Farazmand, A. (Ed.), *Handbook of crisis and emergency management* (pp. 433-450). New York: Marcel Dekker, Inc
3- Dogan, M.&, Higley, J. (1996). Crises, elite change, and regime change, presented at the International Conference on Regime Change and Elite Change in El Paular, Spain, May 30–June 1.
4- Faulkner, B. (2001). Towards a framework for tourism disaster management. Tourism Management, 22(2), 135–147.
5- Haddow,G.D.& Bullock,J.A.(2006). *Introductory to emergency management.* (2nd ed.). New York: Elsevier Publications.
6- Huque, A.S. (2001). Disaster management in Hong Kong. In: Farazmand, A. (Ed.), *Handbook of crisis and emergency management* (pp. 531-544). New York: Marcel Dekker, Inc.
7- Kalantari, B. (2001). Public management and natural disasters: A case study of earthquake management in Iran. In: Farazmand, A. (Ed.), *Handbook of crisis and emergency management* (pp. 433-450). New York: Marcel Dekker, Inc
8- Kendall, Elizabeth; Del Fabbro, Letitia; Ehrlich, Carolyn; Rixon, Kylie. *Rebuilding community: considerations for policy makers in the wake of the 2011 Queensland Floods,* Australian Health Review 35. 4 (Nov 2011): 520-2.
9- Kim, P.S. & Lee, J.E. (2001). Emergency management in Korea: Mourning over tragic deaths. In: Farazmand, A. (Ed.), *Handbook of crisis and emergency management* (pp. 433-450). New York: Marcel Dekker, Inc
10- Koehler, G.A., Kress, G.G., & Miller, R.L. (2001). What disaster response management can learn from chaos theory. In: Farazmand, A. (Ed.), *Handbook of crisis and emergency management* (pp. 433-450). New York: Marcel Dekker, Inc
11- Pinkowski, J. (2001). Potential for disaster: Case study of the Powell Duffryn chemical fire and hazardous material spill. In: Farazmand, A. (Ed.), *Handbook of crisis and emergency management* (pp. 433-450). New York: Marcel Dekker, Inc
12- Queensland Floods Commission of Inquiry, Interim report , August 2011
13- Ritchie, B.W.(2004). Chaos, crises and disasters: a strategic approach to crisis management in the tourism industry. Tourism management, 25, 669–683.
14- Robin C. van den Honert* and John McAneney, *The 2011 Brisbane Floods: Causes, Impacts and Implications, Water* 2011, *3*(4), 1149-1173
15- Schroeder, A., Wamsley, G., & Ward, R. (2001). The evolution of emergency management in America: From a painful past to a promising but uncertain future. In: Farazmand, A. (Ed.), *Handbook of crisis and emergency management* (pp. 433-450). New York: Marcel Dekker, Inc
16- Stanganelli, M.(2008). A new pattern of risk management: The Hyogo Framework for Action and Italian practice. Socio-economic planning sciences, 42, 92-111.

17- Stehr, S.D. (2001). Community recovery and reconstruction following disasters. In: Farazmand, A. (Ed.), *Handbook of crisis and emergency management* (pp. 419-431). New York: Marcel Dekker, Inc
18- Weick, K. (1985). Sources of order in underorganized systems: Themes in recent organizational theory. In Y. Lincoln (ed.), *Organizational Theory and Inquiry*, 128. Beverly Hills, CA: Sage Publications.
19- Williams, G., Batho, S., & Russel, L.(2000). Responding to urban crisis: The emergency planning response to the bombing of Manchester city centre. *Cities, 17*(4), 293-304.