

## A Model for Executive Crisis & Risk Management in Construction Projects

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### ABSTRACT

Given that our country Iran is susceptible to a large number of crises, one of the most important factors affecting on increasing or decreasing the amount of damage and number of casualties in the event of natural disasters is the presence or absence of effective crisis management system. So the attempt of this paper is to present solutions towards establishing a dynamic or Functional crisis management system in four steps of pre-crisis, Start of the crisis, during the crisis and after the crisis. Undoubtedly, approach to a method of implementation in this field help to reduce the events happened by these crisis situations. For these reasons, paying more attention to the crisis management bring many cases as civil defense, sustainable development and development costs reduction including infrastructures and installations.

**KEYWORDS:** management, sustainable development, passive defense, disaster

### 1.INTRODUCTION

Statistics show that over the past twenty years, natural disasters such as earthquakes, floods and storms, have affected eight hundred million people in the world that about three million of them have lost their lives and have had over 500 billion dollars damage costs. Iran is among the top ten accident-prone countries in the world and according to studies, Iran is the fourth in the incidence of natural disasters after India, Bangladesh and China in Asia. More than forty different subsets of natural disasters have been identified that about thirty them threaten Iran [1].

Besides what mentioned above, due to incremental crisis occurrence rates in organizations, which looks inevitable, planning to confront such crises looks absolutely essential. For the reason of efficient planning in organization to confront crises we must study the records of other organizations about their crises to fully benefit from their previous experiences. It should be noted that crises depends on so many factors including natural factors and human factors And because of this have complex structure and is actually quite complicated to fight with them [2].

Natural disasters such as earthquakes, hurricanes, volcanoes, rising sea levels and ocean tides, natural fires, river flooding and drought are still potential hazards causing human casualties social and economic losses. For this reason, in the article we attempt to approach a comprehensive solution to control the crisis in our country. A general definition of crisis is: natural or man-made event that happened suddenly or increasingly and imposes a hardship in human society that basic measures are needed to meet it. According to this definition, disaster management involves several phases such as planning, organization, leadership and control that each of them has an important role in controlling the crisis [2].

Therefor in this article, we have worked on a method for control of crises with a comprehensive approach and with emphasis on 4 stages of:

before the crisis, in the beginning of the crisis, during crisis and after crisis. In each step the administrative actions for prevention of occurrence of undesirable accidents and control of negative effects after the accident are investigated.

Crisis management is based on four pillars which are as follows:

- Stage of readiness before the crisis

This stage includes: prediction, prevention, reducing vulnerability, reducing damage and readiness.

- The beginning of the crisis

This stage includes: safety, warning, pilot training, staffing and facilitating.

- During the crisis

This stage includes: crisis management, establishment of order in society, temporary accommodation, evaluation and review of programs, planning, study and research.

- After the crisis

This step includes: optimization, reconstruction, development, establishment of normal condition, evaluation, review of programs, study and operation research.

## 2.LITERATURE REVIEW

### 1-2 Foreign Unexpected disaster

External Unexpected disasters are divided into two parts which are natural disasters and unnatural disasters caused by man. External Unexpected natural disasters such as earthquakes, floods, storms, lightning, avalanches, tornadoes, fires and volcanoes and unnatural disasters such as war, terrorist incidents, fires, chemical, biological and nuclear accidents, road accidents, industrial accidents, plane accidents, ship accidents, train accidents, construction debris, mass migrations and refugees [3].

### 2-2 Natural disasters prevention

To prevent or reduce the effects of natural disasters, in addition to technical issues the crisis management and planning to deal with crises, caused by natural disasters, are needed. If problems are not anticipated the cost to repair the damages, caused by the crisis, will be very high. Crises caused by natural disasters have considerable effects on society; therefore, understanding the principles and methods of good management of natural crises can be effective on preventing natural disasters occurrence or reduction. This can be effective on preventing the exchange of natural disaster into social and environmental crises; So the availability of programs for appropriate actions in times of crisis, on the one hand, will cause strengthening of the community in all fields and on the other hand will reduce the amount of financial losses, casualties and social, economic and environmental disruption. One of the most important factors that increase or decrease the rate of damages and number of casualties in the event of natural disasters, is the presence or absence of effective crisis management system. The number of casualties caused by natural disasters in the world between 1965 and 1992 was more than 3610000 persons that 88% of which is related to countries with no crisis management system or crisis management system with no fitness and flexibility. Therefore, in areas where natural disasters are always a potential risk, it is necessary to plan to deal with disaster in terms of the overall strategy. The main goals of this planning are: forecasting, crisis preparedness, compensation, using of the opportunities and eventually return to normal condition with only the lowest cost and shortest time based on the identified priorities [4].

### 3-2 Crises:

A general definition of crisis is: natural or man-made event that happened suddenly or increasingly and imposes a hardship in human society that basic measures are needed to meet it. According to this definition, disaster management involves several phases such as planning, organization, leadership and control that each of them has an important role in controlling the crisis [5] .

In order to identify and distinguish the crises, we should determine some criteria to distinguish and categorize them.

#### A: Categorizing crises to “Abrupt crises” and “cumulative” crises:

Some crises happen in a sudden and they have abrupt effects in and out of the organization, these crises are called abrupt crises.

There are other types of crises which are called cumulative crises; they are caused by some root causes and are grown gradually through time and they reach to a limit, and then happen. To contrast “abrupt crises” and “cumulative crises” six key features are discussed: abrupt crises grow rapidly, They are not easily predictable, They are visibly focused, They are caused by a specific sudden cause, They occur in a specified time, They are caused by the noncompliance of the organization with one or few environmental features [6].

On the contrast, cumulative crises are caused in a gradual and cumulative way. They are easily predicted, Their composition is not easily seen, They occur when reaching to a limit, , the probability of occurrence of cumulative crises increases when time elapse and They are caused by the noncompliance of the organization with one or some environmental features [6].

#### B: Categorizing crises with Parson’s view: Parsons defines three types of crises:

- 1- Immediate crises: These kinds of crises have no pre-warnings and organizations have little capacity to investigate and plan to confront them.
- 2- Cumulative crises: these crises are caused gradually. It is viable to stop them or slow them down with organizational procedures.
- 3- Continuous crises: these crises last for weeks, months and even years. The strategies to confront these crises are relevant to the time pressure, extensions of controls and the severity of the crisis.

To identify and categorize the crises we can use three criteria; threat level, time pressure and severity of the crisis. In this way we can show the managers when an incident have the potential to be transformed to a crisis. Bornt suggested a matrix to categorize these crises based on the mentioned three criteria and the criteria of responsiveness to the crisis. There are 16 levels in this matrix.

In the matrix, threat level can be high or low, responsiveness can be high or low, time pressure can be high or low and control levels can be high or low. Subsequently, there are 16 matrix homes.

Bornet defines whenever the level of incident increases from the level one to the level four, the probability of transformation of the incident to a crisis increases [6].

### **C: Categorizing crises with Mitroff's view:**

he uses two ranges to categorize crises. A range defines whether a crisis is internal or external. In other words, some crises happen in the organization and some incidents happen out of the organization. Another range defines technical or social aspects of the crises, as shown in the diagram 1. So, there are 4 distinct circumstances. In each circumstance, some examples of recognized crises are illustrated. For example, the crises of "tamim namadin" in the circumstance 4, shows a situation in which the status of an organization is threatened because its name invokes a negative meaning. For instance, some people who are fan of veganism, might damage the organizations which use a lot of meat for producing foods. Therefore, managers' preparedness for these crises is necessary [6].

### **3-2 Crisis management:**

Crisis management is a systematic approach which the organization endeavors to identify the potential crises and conduct preventive actions in order to mitigate the subsequent effects of crisis.

There is no unique model for crisis management. Crises management researchers have different models for different aspects of crisis management [7].

A comprehensive crisis management model should be presented which includes all aspects of crisis management, since all the aspects are influential. In the diagram 2, a model for crisis management is presented. This process has three main parts: formation of crisis management, crisis management performs and crisis management evaluation [7].

Crisis management are collections of solutions and decisions which are made for confronting crises and the goal is to slow down crisis trend, to control crisis and remove crisis finally. All the actions for risk prevention and management, organizing, available resources management are for the response to crisis. Crisis management contains: plans, structures and regulations that help organization in confronting crises [8].

In a categorizing in the journal of business strategy in 2004, 6 effective steps in crisis management were presented: confronting the accident, rethinking, renovating, crisis sense, intervention and final acts[8].

## **3. MATERIAL & METHODS**

### **Steps of crisis management**

Step 1- preparedness before the crisis: this step is the key step in confronting crises. And preparedness of organization before the crisis helps reduce the effects of crisis in organizations. This step includes but not limited to: forecasting, prevention, reduction of fragility and preparedness.

Step 2- In the beginning of the accident: this step is the beginning of the executive actions of crisis management. All the scenarios about crisis management and all the maneuvers before the crisis were about this step. This step includes but not limited to: immunity, alarming, and gathering of forces and resources.

Step3- during accident: this step is the executive step in crisis management. All the investments and preparing were for this step. The influence of integrated crisis management team and their subsequent decisions in mitigation of crisis effects like crisis control, implementation of discipline, temporary accommodations, evaluation and assessment of plans, planning, studies and investigation are obvious.

Step4- after the crisis: in this step some items like renovation, development, normal situation implementation, evaluation and control of plans, studies and investigations for a successful end help the crisis management team for a successful end.

### **1-3 Actions required in the preparation stage before the crisis:**

- Preparation the maps of vulnerability from urban and industrial areas
- Preparation of Plans for safety and vulnerability
- Preparation of plans for deployment of forecasting disaster facility
- Determination of number, composition and mandate of the needed Committee for initial relief phase
- Determination of number, composition and mandate of the Committee for the temporary accommodation
- Determination of number, composition and mandate of the Committee for the Reconstruction
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### **2-3 Action needed at the beginning of the crisis:**

At this stage that begins immediately after the incident, there should not be a time for planning and major decisions and everything must be predetermined and Just the instructions resulted from the crisis scenario should be carried out within the first 24 hours after the start of the crisis. In this respect, the following notes will ensure the success of the crisis management function. Required actions at the beginning of crisis management stge. In this stage which begins right after the accident occurrence, there is no time left for planning and big decisions and every other thing needed, should be predicted in advanced and only post-crisis actions must be done at uttermost 24 hours right after the accident occurrence.

Therefore the tips mentioned below would be guarantor of crisis management:

- Fast activation of in-need committees and their settlement in predicted places
- Composing of first aid teams regarding to planned structures
- Proper utilization of proper machineries to remove road blockages for faster emergency response
- Establishment of outdoor hospitals in specified areas
- Fats transporting of casualties to hospitals by air and land vehicles
- Providing security for houses and important economical and political buildings
- Air disinfection resulting to halt contagious diseases occurring in natural disasters
- Vaccination and quarantines

- Seeking and gathering dead bodies, identity findings, and their burial
- Transferring of survivors to safe places
- Opening of land routes
- Opening of air ports
- Regular continuing to find casualties and aiding
- Fire control
- Gas and water leakage control
- International communications for foreign help

### 3-3 Required actions during crisis

Although in this stage there is little time for thinking and planning, required actions in this stage should be planned before. The actions in this stage must be done in 2 to 6 days after the accident. As listed below:

- Erection of safe shields and tents and medical camps, proper settlement, provision of food and water, clothes, disposal of garbage, hygiene, seeking the dead and identity finding
- Erection of temporary camps in predicted areas
- Transferring survivors in camps
- Allocating tents to people
- Provision of food for survivors regularly
- Disposal of garbage and sewage regularly
- Provision of medical treatments
- Provision of drinking water regularly
- Provision of toilets and related facilities
- Mental and social treatments
- Supply of power and lightning
- Supply of fuel and energy
- Supply of clothes
- Relief of damaged power and utility system
- Casualty and cost estimation
- Rebuilt of damaged historical buildings

### 4-3 Required actions in the stage of renovation:

The overall framework at this stage is to specify number, roles and responsibilities and structure of committees as planned and considered before crisis, and also in this stage there is much more time to reconsider the program details.

Required actions in this stage are:

Careful inspection of power and utilities, building and loss cost estimation

- Loss cost estimation and specifying number of casualties
- Time estimation to renovate the damages
- Facility locating for new facilities and utilities
- Enhance services provided in temporary housing
- Specify the suitable staff to build new houses, proper techniques for renovating and granting loans to people
- Start of civil works
- Specify proper policies for allocation of housing
- Transferring of people from temporary houses to permanent houses

### 5-3 Finishing stage :

After the end of mission, the facilities should be sent back. In the next step a committee should be joined to analyze the strength and weaknesses of the program and actions. And studies which lead to continual improvement.

## 4. Conclusion

Crises management is a designed process in which organizations try to find and to predict potential crises, so that organizations can have preventive actions towards them to offset negative effects. To do this, it must be determined that crisis in which of its life cycle stage is, so that proper preventive actions will be made.

Crisis management is a guarantee for the survival and prospering of the organization in long-term period. The administrative approaches in 4 key stages in the article help the managers to improve propriety of their decisions in crises happenings and also to feel the full responsibility in forthcoming crises in order to help with the survival of their organizations.

## REFERENCES

1. Badri, S. Ali, et al. "Post-disaster resettlement, development and change: a case study of the 1990 Manjil earthquake in Iran." *Disasters* 30.4 (2006)
2. Laws, Eric, and Bruce Prideaux. "Crisis management: a suggested typology." *Journal of Travel & Tourism Marketing* 19.2-3 (2006)

3. Schott, Christian. "Proactive crises management tools: Ecolabel and Green Globe 21 experiences from New Zealand." *Tourism Review International* 10.1-2 (2006).
4. Dilley, Maxx. *Natural disaster hotspots: a global risk analysis*. Vol. 5. World Bank Publications, 2008.
5. Konečný, Milan, et al. "The usability of selected base maps for crises management—users' perspectives." *Applied geomatics* 3.4 (2011)
6. Rezvani, Hamid Reza. "Corporate Crisis Management". *Monthly - year plan eighteenth* - 170(2006)
7. Rezvani, Hamid Reza. "integration of disaster management strategies". *Monthly - year plan eighteenth* – 177(2007)
8. Muslim Habibi. "Six important step in crisis management". *Journal of business Strategy*(2008)