

# Models and patterns of crisis management with an emphasis on floods

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## Abstract

Basically, the establishment and creation of a city depends on the conditions and geographical location more than anything else. According to the geographical location on which the cities are located, they may face different geomorphological phenomena for their future development. Therefore, unlike most countries that summarize the crisis management in the next stage of the crisis. Actions should be taken in the framework of recognizing areas of natural disasters such as floods and planning the location and environmental characteristics of cities in order to optimize their development in order to reduce environmental risks, costs and problems in service delivery, etc. The future of the region should be considered. The adoption of crisis management is a systematic management for the implementation of policies, strategies and social or individual coping capabilities along with the reduction of encounters and events of natural, environmental and technological risks. The occurrence of a crisis can change the current strategy and strategic actions in a society or organization. On the other hand, without carrying out strategic measures in the field of crisis management, the probability of occurrence of critical events also increases; Because in strategic planning, it is possible to simultaneously pay attention to the internal and external factors and forces effective in the crisis management process, and it makes the field for integrated management more possible. The crisis

is addressed, based on the results of the research, the most important of which include the following; Resilience (which includes five models: Tobin, sustainable livelihood, linear-temporal, capital-oriented, community-oriented disaster management, community-oriented disaster management), Barnett's model, reactive model, traditional model and comprehensive model of crisis management.

**Keywords:** model, pattern, crisis management, flood, resilience

## Introduction

Recognizing and creating the capacity to deal with floods for communities that are increasingly facing natural disasters (Kuhlicke, 2011) (as a basis for developing strategies to deal with special needs, to allocate resources, priorities and standards) It will be important and necessary to ensure public security (Kaewkitipong and et al., 2010). Nowadays, the social, psychological, economic, and physical effects of floods are not hidden from anyone. Therefore, it is important and necessary to recognize and build the capacity to deal with floods for the societies that are increasingly facing them (Kuhlicke, 2011: 804). But before that, the identification process is used as a basis for developing strategies to deal with special needs, to allocate resources and priorities and standards in providing public security (Kaewkitipong and et al., 2012). The occurrence of a crisis can also change the current strategy and strategic actions in a society or organization (Kaewkitipong et al., 2012). On the other hand, without carrying out strategic measures in the field of crisis management, the probability of occurrence of critical events also increases; Because in strategic planning, it is possible to simultaneously pay attention to the internal and external factors and forces effective in the crisis management process, and it makes the context for integrated management more possible (Haji Beyglu et al., 2016: 75). There are many models and patterns regarding crisis management, which we will introduce and discuss each one below. Resilience models in natural disaster management

1-) Tobin's model (1999) has been proposed to investigate and evaluate the resilience of

communities located in high-risk areas. The framework used in this model is more ecological and to show how society is stable and resilient, it is a combination of three models for reducing physical risks, attitudes for examining risk reduction and reduction plans, recovery model for recovering the capital structure and government plans. , private and distribution and structural-demographic model, investigation of structural change factors, physical, cultural and economic factors have been used. These are related to each other and affect the goals related to sustainability; Finally, in this model, the characteristics of a sustainable and resilient society are presented. The ultimate goal of this framework is to reach the level of stability and resilience of communities against technological and natural hazards. The focus of this model is on the role of sustainability in risk reduction in such a way that sustainable and resilient societies are societies that, from a structural point of view, reduce the consequences of disasters as well as rapid recovery by rebuilding the vital, socio-economic factors of the society.

2- The Sustainable Livelihood Model (DFID, 2006) is a framework used by the International Strategy for Disaster Reduction (ISDR) to reduce poverty after natural disasters and is presented as an integrated framework for understanding the many sources of poverty and solutions for it. has been The perspective of sustainable livelihood with emphasis on participatory perspectives is a useful tool for designing people-centered projects to reduce poverty. This framework includes the combination of types of capital in strengthening the resilience of society, which includes natural, social, financial, human and natural capital.

3- Time-linear model (Davis (2006): according to the definition of resilient society, it shows that a society in the form of a time line in certain conditions following development can improve its vulnerability over time. This model has three

stages: absorption and tolerance of the stress and impact before the disaster; the ability and capacity to return to the balance during and after the disaster; changes in the societies in order to become safe and resilient.

4- Capital-based model (Mayanga, 2007): The capital-based model has been proposed as a framework for evaluating society's resilience against disasters based on types of capital (social, economic, physical, human, and natural). Each type of capital has an independent field and can be measured by various factors and the relationship between these factors to evaluate the resilience of society against disasters. The nature of capital is very close to the concept of sustainability, and the concept of sustainability is often the concept of resilience against disasters, which means that capital includes elements that are dependent on development. It is necessary to use the approach of the economic capital of the society and the greater the economic opportunities of the society, the greater the potential ability of the society to reduce the consequences of disasters, and finally, with these conditions, the society becomes more resilient.

5- Community-based disaster management model: This model is a bottom-up management approach that pays attention to people's participation in solving crises caused by natural disasters, and in fact, its goal is to reduce the vulnerability of communities and strengthen people's abilities and participation. It is to deal with the dangers caused by natural disasters (Rafian et al., 2013:34).

Crisis management models:

A- Barnett's model

In his model, Barnett describes the tasks and factors that enable the organization to use crisis management properly (Figure 3-2). In this

model, the author first shows the factors that exist against crisis management (Boudreaux, 2006:8): time pressure, issues related to control, threat level, limitations related to the choice of the type of confrontation. Barnett claims that these factors reduce an organization's ability to focus and strategically manage a critical situation. According to this model, strategic crisis management will not begin until these four factors are under the control of the organization's management (Boudreaux, 2006:11).

Barnett categorizes this six-step model into three general classes:

- Identification: the identification stage is a combination of targeting and environment analysis; This is the stage of preparing for the crisis.
- Exposure: exposure includes strategy creation and strategy evaluation; The point where the organization gets involved with the crisis.
- Reconfiguration: The last step is reconfiguration, which includes strategy implementation and strategy control; That is, how to adapt the organization to a critical situation. According to the author's belief, during the crisis, the difficulty of correctly implementing the organization's management tasks increases increasingly (Boudreaux, 2006:8)).

B-Pearson and Mitroff's crisis management model

Effective management from the perspective of Pearson and Mitroff (1993); It involves managing five specific stages that crises go through: (1) identifying or tracking symptoms, (2) preparedness and prevention, (3) containment of destruction, (4) recovery, (5) learning.

This model starts by identifying or tracking the signs of crisis, then it ends with the learning process from the improvement stage, and then the learning results return to the first stage, and this cycle continues like this.

(Pearson and Mitroff, 1993:54).

C- Reactive model versus proactive model:

Basically, in crisis situations, crisis is looked at in two ways: reactive and proactive. Organizations can ignore the warning signs and react to the crisis when it occurs, and they can prepare themselves to face the crisis and manage it in advance. In the first case, the consequences of the crisis are not known. But in the second case, it not only provides opportunities for managing the crisis, but it can even lead to averting the crisis (Mahdavi and Tab, 2016).

In the reactive model, crisis-related decisions are taken during or after the events, but in the proactive model, decision-makers anticipate different forms of crisis and plans to deal with them. The first step in the proactive model is the pathology analysis of the crisis, which tries to identify the vulnerable points in the organization as well as the effective factors in the occurrence of the crisis. "Slater" has presented a model to identify effective factors in organizational crisis. In this model, managerial and organizational characteristics affect the effectiveness of the decision, and then the environmental variables and competition, together with the effectiveness of the decision, shape the degree of movement towards the crisis (Wilson, 2003).

Common patterns in crisis management

1. Traditional pattern

The traditional model can be divided into three stages: the pre-crisis stage, the crisis stage, and the post-crisis stage; The first stage itself includes activities such as prevention, reducing

the destructive effects of disasters and preparation. However, the second stage includes activities related to accountability and the third stage includes recovery and development activities (Jahangiri and Fallahi, 2018).

## 2. Gonzales Herro and Prad model

In this crisis model, there are four stages: birth, growth, maturity, decline; In fact, this model is a comparison between the crisis of the life cycle. The providers of this model believe that with all the management measures before the crisis occurs, the effects and results of the crisis can be changed (Gonzalez Herro and Pratt, 1996:82).

## 3. Ring model

Kelly, 1998, has proposed a circular model for crisis management. This model has helped to reduce the complexity of disasters and also depicts the non-linear course of the nature of events that occur in disasters. In this model, more emphasis is placed on the practical needs of disaster management. In this model, the relationship between data, output and crisis effects can be expressed (Rabiei, 2013).

## 5. Fink's model

The mentioned model has four stages: identification of initial symptoms of crisis, acute crisis, chronic crisis, crisis resolution (Penros, 2000: 162).

## 6. The two-part model of crisis management

In the mentioned model, crisis management includes a series of mission steps and support measures; Therefore, it is referred to as a two-part model. Mission actions include forecasting, prevention, normal confrontation, special confrontation and restoration and reconstruction, and support actions include psychological operations in crisis, information in crisis, social

assessment in crisis and information protection. (Rabiei, 2013)

## 7. Onion-shaped pattern of Mitra and Shrivastava

This model provides a framework for crisis preparedness and consists of layers; the first layer includes strategies, programs, behaviors and organizational recovery.

The presence of official warning systems, investigation of mechanisms indicating weaknesses and problems, containment, training and simulation mechanisms for crisis management have formed the content of this layer.

The second layer or the organizational structure presents the official actions and policies of the organization according to the appropriate planning. By analyzing the roles, resources and common information between groups, groups and departments, this layer examines and directs the support of top management and intra-organizational cohesion, the flexibility of the organization and the warning systems of the impending crisis.

## 8. Lot pattern

Lott (1990) considered the crisis management cycle as consisting of 5 stages: waiting, warning, rescue, normalization and rehabilitation. According to this model, the process of crisis management starts with waiting for the crisis or in other words predicting it and ends with the rehabilitation of the damaged and crisis-stricken system (Badri, 2017).

## 9. Comprehensive model of crisis management:

The process of crisis management in this model consists of four stages before, beginning, during and after the crisis. Each of these management stages has its own demands and affects the

administration and management of the next stage. In the following, the components of the mentioned model will be explained:

- Pre-crisis stage

A: Prediction stage: In this stage, it is expected that different and related crises can be predicted by adopting the approach of crisis sensitivity and equipping with hyperactive strategy. Meanwhile, the role of research and research institutions is important, as well as interacting with parallel institutions and bodies responsible for crises and helping to prepare regulatory laws and regulations are other important measures of this stage of crisis management.

-B: prevention or reduction stage; Prevention is also a very important step in the process of crisis management, which comes after the prediction stage. With prevention, many crises can be prevented or their severity can be reduced.

C: Preparation stage: Crisis happens all the time and in every situation, therefore, societies and society should always be ready to face the crisis, so public education in this regard helps a lot in the preparation of people in the society to face the crisis. Creation of single information centers and At the same time, being equipped and advanced and even appointing a spokesperson for critical situations are among the measures that should be taken at this stage (Bernstein, 2004).

- The beginning stage of the crisis

The first twenty-four hours of the crisis have their own characteristics and conditions, which makes it necessary to deal with this time period separately and as the beginning stage of the crisis. This stage includes three basic steps, all of which must be implemented in the mentioned time period:

warning and immunity stage; This stage is partially consistent with the warning stage in the LOT model and as it is clear from the title of this stage, it is expected that by using warning systems and using information bases and centers and issuing announcements from the mass media, the society will be Inform the possible dangers and take the necessary measures as much as possible in order to protect the population that is affected by the crisis.

b) The stage of preliminary assessment and mobilization of resources In this stage, due to the preliminary assessment of the level and severity of the crisis, attention should be paid to the mobilization of all human and non-human resources.

c) rapid reaction stage; At this stage, a series of urgent and urgent actions called rapid response should be carried out. For example, it can be said that crises are pregnant with rumors and at the same stages of the legitimate formation of the crisis, if these rumors are not controlled and managed, the deterioration of the situation will be added and maybe other crises will emerge from the heart of the crisis (Badri, 2017).

- The stage during the crisis

a) rescue phase; This step is one of the most important steps. At this stage, it is expected that necessary and urgent measures will be taken to help the injured and those affected by the crisis.

b) special operation stage; Ghalbazmani, which is beyond the capacity of local communities and institutions to control the crisis, requires special operations to control the situation.

c) containment phase; Basically, the goal of crisis management is to contain and extinguish the crisis, in other words, the result of the special operation phase should lead to the containment of the crisis and crisis-causing factors. At this stage, all the persuasive methods and measures



should be used to contain the crisis (Roshandel Garbanani, 2018).

- Post-crisis stage

a) recovery stage; In the crisis recovery stage, it is necessary to take a series of measures to calm and restore the situation to a normal state after containing and suppressing the crisis.

b) reconstruction stage; The first step of action in reconstruction is to clear the crisis environment of any signs and evidences of crisis and this stage is also interpreted as the stage of restoration, improvement, rehabilitation and redevelopment.

At this stage, the agencies in charge of crisis management should provide counseling, treatment and rehabilitation measures to heal the victims of the crisis and mobilize all their facilities in order to improve the situation and restore the damaged areas.

c) learning stage; Despite the very high importance of this stage, it is often neglected in crises, and for this reason, it can be seen that after a while, the crisis reoccurs in a different form and predominance. In order to take advantage of the experiences of such crises, it is necessary for the society and Rasul institutions to have the characteristics of a learning organization and to create a knowledge management system to record and record crisis management experiences for possible future uses. In addition, at this stage, it is necessary to identify the roots of the crisis and diagnose the crisis management system by forming working groups and committees (Roshandel Garbanani, 2018).

Different approaches in facing the crisis and solving it

1. Crisis avoidance approach: Managers who choose such an approach in management use a

passive and reactive strategy in the face of crises. They don't have any prior preparation and specific plan to deal with the crisis, and when faced with it, they react passively and maximally. Such managers do not take any action until they feel the pressure of public opinion in a critical situation, or it can be said that they act when they feel a threat to themselves and their organization in a critical situation.

2. Anti-crisis approach: This approach is faced and dealt with by accepting the crisis as a natural law with an active strategy.

Managers and organizations that have such an approach use all their powers and capacities to predict the crisis before it occurs and deal with it effectively.

3. Approach to crisis: In this approach, in addition to accepting the crisis as a matter of content, it is anticipated and welcomed; In other words, by adopting a super-active strategy, the emphasis is placed on discovering new opportunities for growth and dynamism.

Based on this, every crisis may bring with it opportunities. Therefore, one should look forward and wait for crises and obtain the necessary forecasts and preparations in advance to face them, so that if they occur, they can be exploited in order to create opportunities. to be

Managers who have this type of attitude are not only subject to crisis conditions and do not comply with them, but they adapt the conditions to their goals and objectives, such managers have the ability to turn crises into opportunities, and in fact, this approach covers all stages of crisis management, including It has paid attention to before, during and after the crisis (Roshandel Garbani, 2018).

Risk management approaches, considering the risk management process and cycle, can be done in three directions:

1- Top-down risk management approach with standard and fan-oriented policies

This approach for the management and general reduction of environmental risks emphasizes the expansion of scientific tools and techniques and the methods and criteria emphasized to reduce floods mainly through preventive activities such as planning guidelines and regulations to reduce floods, criteria for retrofitting buildings and dams and dams. It takes place (Smith, 1382:170). In order to reduce floods, recording and predicting accidental events of floods, announcing early flood risks, providing decision-making tools to reduce floods, awareness models, training, etc. are used to manage and reduce floods (Jigyasu, 2002:62). In this approach, many of the activities carried out are purely technology-oriented and are based on model, order and control. These activities have given special importance to the development of strategies and regulations and require standard solutions and have a command and top-down mode, mainly the activities and measures taken to manage and reduce floods in rural communities have been imposed from outside and the government is responsible for flood management. He is responsible for it in all stages. Therefore, since this approach does not pay attention to people's participation, it is not successful in flood management in many cases, because decisions are issued from higher authorities based on their understanding of the dimensions, effects, and results of hazards, especially floods.

2- Bottom-up risk approach or based on local communities and indigenous knowledge

The mentioned approach is based on the local community and from the bottom up and does not

assume the responsibility of environmental risk management in all stages based on external aid and government forces. Rather, he believed that the local population and indigenous people should be involved in this matter as people who have experience and the ability to act and participate.

3- Integrated collaborative approach

This disaster management approach is a combination of two bottom-up approaches in line with the top-down approach, and local communities should be supported in order to analyze their dangerous conditions, their capacities and their vulnerability (Pandey, and Okazaki, 2004). In the integrated type of approach, the role of the central and provincial governments in providing budgets, financial resources, providing suggestions and consultations is limited (Medury, 1996) and the main stages of natural disaster management are the responsibility of the local community (Buckle, 2000). The characteristics of this approach are The description is as follows: participatory approaches in line with the technology of the day to defend a sustainable environment, management compatible with people's needs by adopting the most compatible technologies, strategies, law-based management strategies for responsible institutions according to the laws prioritized based on the opinions and needs of local people, adaptation strategies between management policies with Environmental and local conditions in the formulation of laws, adoption of a base development strategy with the aim of improving the level of resistance standards of the Minister of Construction, a participatory approach with regard to the effective dimensions of ecological sustainability in management, strategies in line with the empowerment of local communities in order to eliminate the dimensions of the vulnerability of communities, institutionalization to improve the capacities economic, social and

environmental aspects of communities at risk, executive and supervisory strategies of institutions with the participation of local people, collaborative strategies between people and related crisis management institutions (Foudi and Agreso, 2014)

Conclusion

Without carrying out strategic measures in the field of crisis management, the probability of occurrence of critical events also increases; Because in strategic planning, it is possible to simultaneously pay attention to the internal and external factors and forces effective in the crisis management process, and it makes the field for integrated management more possible. Among them, there are many models and patterns regarding crisis management, the most important of which are as follows.

1- Tobin's model; It has been proposed to investigate and evaluate the resilience of communities located in high-risk areas

The ultimate goal of this framework is to reach the level of stability and resilience of communities against technological and natural hazards.

2- sustainable livelihood model; It is a framework used by the International Strategy for Disaster Reduction (ISDR) to reduce poverty after natural disasters and is presented as an integrated framework for understanding the many sources of poverty and solutions for it.

3- linear-temporal model; According to the definition of resilient society, it shows that a society can improve its vulnerability over time in the form of a timeline under certain conditions following development. This model has three stages: absorbing and tolerating the stress and impact of danger before the accident; Returning to balance after an accident means the ability and capacity to return to balance during

and after disasters; Changes in societies to make them safe and resilient.

4- capital-oriented model; The nature of capital is very close to the concept of sustainability, and the concept of sustainability is often the concept of resilience against disasters, which means that capital includes elements that are dependent on development. It is necessary to use the approach of the economic capital of the society and the greater the economic opportunities of the society, the greater the potential ability of the society to reduce the consequences of disasters, and finally, with these conditions, the society becomes more resilient.

5- Community-oriented disaster management model; This model is a bottom-up management approach that pays attention to people's participation in solving crises caused by natural disasters, and in fact, its goal is to reduce the vulnerability of communities and strengthen people's abilities and participation to deal with the risks caused by disasters. It is natural.

6- Pearson and Mitroff crisis management model; Effective management from the perspective of Pearson and Mitroff; It involves managing five specific stages that crises go through: (1) identifying or tracking symptoms, (2) preparedness and prevention, (3) containment of destruction, (4) recovery, (5) learning.

7- Barnett model; In his model, Barnett explains the tasks and factors that enable the organization to use crisis management appropriately. In this model, the author first shows the factors that exist against crisis management: time pressure, issues related to control, threat level, limitations related to the choice of the type of confrontation. Barnett claims that these factors reduce an organization's ability to focus and strategically manage a critical situation. According to this model, strategic crisis management will not



begin until these four factors are under the control of the organization's management.

8- Reactive model versus proactive model; In the reactive model, crisis-related decisions are taken during or after the events, but in the proactive model, decision-makers anticipate different forms of crisis and plans to deal with them. The first step in the proactive model is the pathology analysis of the crisis, which tries to identify the vulnerable points in the organization as well as the effective factors in the occurrence of the crisis. In this model, managerial and organizational characteristics affect the effectiveness of the decision, and then the environmental variables and competition, together with the effectiveness of the decision, shape the degree of movement towards the crisis.

9- traditional pattern; The traditional model can be divided into three stages: the pre-crisis stage, the crisis stage, and the post-crisis stage; The first stage itself includes activities such as prevention, reducing the destructive effects of disasters and preparation. However, the second stage includes activities related to accountability, and the third stage includes recovery and development activities.

10- comprehensive model of crisis management; The process of crisis management in this model consists of four stages before, beginning, during and after the crisis. Each of these management stages has its own demands and affects the administration and management of the next stage.

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