

# Evaluation of Modern Approaches to Crisis Management

Daniel BREZINA<sup>1\*</sup>, Jaroslav KOMPAN<sup>2</sup>

<sup>1</sup>Security and Defence Department, Armed Forces Academy of General Milan Rastislav Štefánik, Address: Demänová 393, 031 01 Liptovský Mikuláš, Slovakia

<sup>2</sup>Department of Military Tactics and Operational Art, Armed Forces Academy of General Milan Rastislav Štefánik, Address: Demänová 393, 031 01 Liptovský Mikuláš, Slovakia

Correspondence: \* [jaroslav.kompan@aos.sk](mailto:jaroslav.kompan@aos.sk)

## Abstract

Decision-making is an important function of crisis management as a resolution technique for the negative impacts of crisis phenomena. There are several models and concepts of crisis management in the world, which were compared in the study and an evaluation table of crisis management models was developed. The main objective of the study was to evaluate modern approaches to crisis management (crisis management models) with the intention of providing recommendations on the practical application of these models in crisis management for the development of the crisis management system within government agencies. The comparative analysis was carried out using the rules, relationships and regularities that apply in complex management models.

**KEY WORDS:** crisis; crisis management; models; comparative analysis; rescue services.

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## 1. Introduction

Crisis phenomena have a negative impact on the natural development of human society. The issues of their prevention and, consequently, their resolution is becoming more and more topical. Emergencies, especially natural disasters, have a special place in the crisis management system. They can affect large populations and have a negative impact over a wide area [1]. Their consequences usually have a negative impact not only on population and the environment, but also on the material resources and cultural heritage located in the affected area. In the case of large-scale natural disasters, the functioning and stability of the country's entire economy can be threatened and disrupted [2].

Decision-making is an important function of crisis management, and we can refer to it as multi-criteria decision making, and its importance increases during the resolution of crisis phenomena. It is a complex and demanding process that is influenced by the nature of the crisis phenomenon itself. Crisis managers and the various public authorities and institutions involved in dealing with crisis phenomena are under pressure from the media and the public, who demand a rapid and effective response to emergencies and the minimization of damage and loss [3]. The role of public administrations, with an emphasis on local government, in dealing with emergencies is extensive and complex [4].

The main objective of the study was to evaluate modern approaches to crisis management (crisis management models) with the intention of providing recommendations on the practical application of these models in crisis management for the development of the crisis management system within government agencies. Various quantitative and qualitative methods and tools were used to achieve the objective of the study, with the main emphasis on comparative analysis, which was used to compare different approaches (models) of crisis management, following the principles that the model should reflect the characteristics of the modelled reality.

## 2. The Theoretical Background

At the beginning of the study, it is necessary to define the basic terms and concepts related to the problems addressed. They will form part of the theoretical basis for increasing the effectiveness of crisis management processes, for assessing the conditions of the above-mentioned activities and, ultimately, for optimizing the decision-making processes at the local government level. The choice of individual terms and their concepts was influenced by several facts.

Various crisis phenomena have affected mankind since the very beginning [5]. In the course of time, with the development of society and technical and technological innovations of various kinds, the frequency of crisis phenomena has increased. This means that the probability of their occurrence has also increased, which is why the issue of crisis management, which is a specific part of public administration, has become more complicated.

To manage individual crisis phenomena, it is necessary to understand the behavior of complex systems, their functions, and interconnections. In the case of natural disasters, it can be difficult to predict their occurrence and overall course. For this reason, the existence of a specific type of management, known as crisis management, is essential. In general, there are three basic perspectives on the definition of crisis management [6]:

25. functional approach - crisis management is characterized as a specific activity aimed at solving a crisis using specific principles, methods and tools aimed at overcoming negative impacts and restoring the system,
26. institutional approach - crisis management is perceived as a system of institutions and staff, dealing with the analysis of the possibilities of crises in each system, their causes and possible impacts and the identification of measures and tools to prevent them and to eliminate negative consequences in the event of their occurrence.
27. theoretical approach - crisis management is defined as a logically arranged set of knowledge about possible crises, their causes, and consequences at the level of security of the state, society, economic activities, and properties, as well as about the principles, possible methods, and measures for their solution.

In a broader sense, crisis management out of wartime can therefore be a set of management activities of crisis management bodies, which are aimed at analyzing and evaluating security risks and threats, planning, taking preventive measures, organizing, implementing, and controlling the activities carried out in preparation for crisis situations and in their resolution. State administration bodies, including local state administration, are involved in crisis management. Local state administration bodies represent a hierarchically lower level of state administration. They consist of authorities that are directly subordinated to a central government body, and which have established an independent governing body with a country-wide scope of activity. Competent authorities use different models or crisis management schemes in crisis management, which are different in terms of the overall management system and individual processes. Selected models will be further analyzed in the following chapter.

### 3. The Models of Crisis Management

The basic theoretical model of crisis management is *the "Šimák - basic model"* which consists of four crisis management processes - prevention, crisis planning, response and recovery [7]. In the prevention phase, the most important step is the identification and assessment of all current risks and threats, followed by the development of crisis forecasts and crisis scenarios. The primary goal of prevention is to prevent the occurrence of negative consequences of crisis phenomena through various measures and activities. A separate and no less important phase of crisis management in the preparatory phase is crisis planning, in which crisis and contingency plans are developed with the main purpose of protecting society and common values [7]. The protection of society has created the conditions for a link between the prevention of severe natural hazards and the planning documents of the municipal authorities of cities [8].

After the period of preparation for crisis phenomena and the occurrence of a crisis phenomenon, there follows the period of resolution of crisis phenomena. The immediate response to an emerging crisis requires the immediate deployment and coordination of the forces and resources needed to deal with the crisis. This phase follows the immediate gathering of information about the crisis phenomenon and its correct assessment and evaluation. The immediate response is carried out through rescue operations and various activities with the primary objective of preserving human life, material assets, the environment and cultural heritage. The recovery phase is mainly developmental in nature, allowing the system to return to its original stabilized (pre-crisis) state. The feedback loop is of great importance in the basic model of crisis management. It represents a means of improving and strengthening crisis management at its various levels [7].

Some authors refer to the described theoretical model of crisis management in the form of a cycle. These approaches usually identify from four to eight phases of the crisis management process applied in cycle form [9], propose six phases of crisis management [10], or present a simplified four-phases modified model of crisis management [11]. In practice, generally, all of the above models are implemented sequentially in several stages. The models allow for the implementation of new organizational, administrative, and technological elements in the prevention, crisis planning and preparedness phases, respectively, in an effort to improve and make crisis management more effective at all levels of management.

In general, it can be concluded that the above crisis management system respects the specificities, principles, as well as the legal environment and historical experience of the countries in which it has been developed. This crisis management system primarily uses organizational structures of a line-state nature and is made up of specific public authorities, i.e. the national administration (central and local) and the municipalities (regional and local). An integral part of the crisis management system is its executive branch, whose members must be able to deal with even the most complex crisis phenomena.

The other model of crisis management prevalent in the OECD is *the "Baubion model"*, according to which crisis management consists of three basic phases [12]:

1. crisis readiness (pre-crisis),
2. response to reduce the damage (during a crisis),
3. feedback (post-crisis).

Crisis management is also a core task of NATO. As part of the implementation of an adequate response to emerging crisis phenomena of a natural or military nature, NATO applies *the "Marinov model"*, which represents the strategic concept

of crisis management in NATO [13]. The model assesses the current situation and develops a comprehensive response through a six-phase crisis management process:

4. identification of the risk factors with subsequent warning of the population and notification of specific authorities and institutions involved in crisis management,
5. a comprehensive assessment of the crisis phenomenon,
6. planning phase,
7. adequate response phase [14],
8. implementation of other necessary measures to minimise the negative consequences of crisis phenomena of a natural or military nature,
9. transition to a phase in which the threat no longer poses a danger to NATO member countries.

The “Marinov model” allows crisis staffs and committees within NATO institutions to coordinate their work and provide information to the North Atlantic Council. The different phases are not precisely defined in terms of timing and organization, they may overlap, and their duration depends on the specific situation.

*The “Jaques model”* of crisis management is based on a holistic perspective presenting crisis management as a continuous and coordinated management activity using non-linear elements. Prevention and preparedness for crisis phenomena are as important as the activities to be implemented in the response phase. Feedback has a crucial role in implementing new elements in the preparation and management of future crises [15]. The “Jaques model” is characterized by its non-linear structure, emphasizing that the different phases of crisis management should not be seen as sequential steps, but as a set of interrelated crisis management actions and activities.

In less developed parts of the world, crisis management models are adapted to the financial, material and personnel capacities of countries. For these countries, a model that allows a smooth transition from general crisis management to natural risk management for sustainable development is preferable. *The “Hamani model”* represents a model of crisis management in countries on the African continent, a form of integration between local authorities and the community located in the affected area [16]. The main objective of the “Hamani model” of crisis management is to improve the resilience and cooperation of the civilian population in dealing with natural disasters. The model provides relevant standardized information for each type of hazard, such as floods, earthquakes, and landslides. The overall effectiveness of the model is conditioned by a rigorous analysis of the territory.

The complex procedure of solving crisis phenomena is characterized by *the “Šimák - complex model”*. The complex procedure of solving crisis phenomena is much more complex than the basic theoretical model of crisis management. In addition to the type of crisis phenomena, it is also necessary to consider its severity and the environment in which it takes place [7]. This model is based on the basic model, which has been extended in order to adapt to the conditions and to deal with the likely crisis phenomena. Sources of crisis phenomena, whether in natural, social, technological, economic, or other processes, can give rise to crisis phenomena. The intensity of the impact of the negative factors of crisis phenomena can be influenced by a comprehensive process of proper risk assessment. Risk assessment is a process of verifying the intensity of impact of crisis factors and their level of acceptability [17]. If the intensity of the threat of a crisis phenomenon exceeds the level of its acceptability, or if negative factors act, a crisis phenomenon will occur.

The crisis phenomenon is followed by the crisis response phase. First of all, it is necessary to warn the population and notify specific persons by activating the warning and notification network. These networks ultimately support the initial rescue efforts, which are an elemental part of the response [18]. The technical means used for warning and notification can be of different nature, such as siren networks, radio and television broadcasts, public address systems, local information means of municipalities and cities, automated notification systems and last but not least, public electronic communication networks. The implementation of the necessary measures is directly followed by the actual handling of the crisis phenomena by the Integrated Rescue System components and the components of the legal persons and business entities owning the premises in which the crisis phenomenon has occurred. Crisis management consists of two elementary activities, namely the elimination of the negative consequences of crisis phenomena and the prevention of new crisis phenomena. The last phase in both the basic crisis management model and the complex crisis management process is recovery, the tasks, and activities of which are the responsibility of the statutory representative of the institution that has been affected by the negative consequences of the crisis event. In part, recovery can also be carried out by the forces and means that participated in the rescue work [7] (Šimák, 2016).

*The “Ristvej model”* is a simplified model of crisis management introduced in the project “Community Based Comprehensive Recovery”. This four-phases model [19] is based on a six-phases crisis management cycle [10].

To evaluate the current state of crisis management concepts and models, Table 1 was created, listing the options and criteria. The variants represent selected crisis management models, and the criteria are characteristics of these models. The evaluation table of crisis management models was prepared primarily in cooperation with experts on crisis management in the conditions of the Slovak Republic, including specialists and experts from institutions dealing with the issue of crisis management. The selection and formulation of the evaluation criteria, or characteristics of individual models, was influenced by several factors. The evaluation criteria were designed to consider, in particular, the structure and practical application of the selected crisis management models. All evaluation criteria are qualitative in nature. The only exception is the criterion assessing the number of phases/steps of the crisis management model. This criterion is of a quantitative nature as it can be expressed numerically.

Table 1.

Crisis Management Models Assessment Table

Criteria	Model Baubion	Model Marinov	Model Jaques	Model Hamani	Model Šimák – basic	Model Šimák – complex	Model Ristvej
No. of steps	2	6	4	5	4	7	4
Users	OECD	NATO	Crisis management bodies in the public administration	Less developed countries	Crisis management bodies in the public administration	Crisis management bodies in the public administration	Crisis management bodies in the public administration
Subsidiarity	NO	NO	YES	YES	YES	YES	YES
Algorithm structure	Linear	Linear	Non-linear	Non-linear	Non-linear	Non-linear	Non-linear
Applicability for crisis phenomenon	YES	YES	NO	YES	YES	YES	YES
Limitations	Legal	Subordination of military forces	The paradox of vulnerability	Acquisition of input data	Failure to accept the wider context	Loss of flexibility	Overlapping of activities in the model phases
WHO crisis phenomenon classification	Natural-climatic, economic, military conflicts	Natural-climatic, military conflicts	Natural-climatic	Natural-climatic, anthropogenic	Natural-climatic, anthropogenic	Natural-climatic, anthropogenic	Natural-climatic, anthropogenic

#### 4. Discussion

To improve the quality of crisis management processes in the OECD context, an adaptation of the legal environment is essential. Countries that are members of the OECD are contractually obliged to comply with the recommendations and guidelines, but these are not legally obligatory. At present, there are not legally obligatory and transparent country-specific strategies for the crisis management system in the OECD. The “Baubion model”, alone among the selected crisis management models, also assesses risks in selected regions based on historical context. Other advantages of this model are the joint approaches developed between the different agencies for public information and the flexibility of multi-purpose teams to deal with crisis phenomena of different nature, whether natural, military, or economic.

The “Marinov model” allows crisis staffs and committees within NATO institutions to coordinate their work and provide information to the North Atlantic Council. The individual phases are not precisely defined in terms of time and organization, they may overlap, and their duration depends on the specific situation. Crisis management in NATO, similarly to crisis management in the OECD, has a specific role compared to other models, because it involves not only individual countries, but also about institutions that consist of contributions from individual member states. In addition to the military domain, crisis management in NATO has a political dimension. It is the particular individual interests of the politicians and leaders of NATO member states that can have a negative impact on flexibility, especially in responding to emerging crises, and ultimately prolong the actual resolution of crises. Article 5 of the Washington Treaty deals with the principle of collective defense, where the member states agreed that an armed attack against one or more of them in Europe or North America would be considered an attack against all, and therefore agreed that if such an armed attack occurred, each of them would apply the principle of individual or collective defense. This obligation only applies in the case of an attack on one of the allies. The principle of collective defense does not deal with a potential military operation in which a NATO member would participate voluntarily. A positive aspect of the “Marinov model” of crisis management is the coordination and cooperation with other international crisis management organizations (UN and OECD), as well as the preparation of studies on political problems and the monitoring of trends in the development of the political situation in the world.

The “Jaques model” of crisis management deals with crisis management in the context of interdependent activities that need to be carried out in the different phases of crisis management. This model is characterized by its non-linear structure, which emphasizes that the individual phases of crisis management should not be seen as successive steps, but as a series of interrelated branches of crisis management. The peculiarity of the “Jaques model” is that it is the only one among the selected models of crisis management that does not follow the principle of subsidiarity. The model streamlines strategic relations, increases their effectiveness, and ultimately optimizes decision-making processes in crisis management. We can consider the

so-called shortcoming of this model as the paradox of vulnerability. Each of the four phases of the model is subdivided into three further sub-phases. Too many individual activities in the model can make it ineffective and unworkable in certain practical conditions. We can consider the “Hamani model” as one of the best crisis management models. This generic model is intended for less developed countries, especially for the countries of the African continent. For the first time, the “Hamani model” was applied in the conditions of Algeria. The main goal of the model is to improve the resilience and cooperation of the civilian population in solving crisis phenomena of a natural and environmental nature. The model provides relevant standardized information for each type of threat, such as floods, earthquakes, and landslides. The overall effectiveness of the model is conditioned by a rigorous territorial analysis. The technological attributes of the “Hamani model” represent its positives, and at the same time they are also its shortcomings. On the one hand, the model can work with ARCGIS map data, on the other hand, obtaining input data in such a format represents a significant problem for African countries, and it is not possible to apply this technological innovation in all areas [20]. In the future, it would be necessary to adapt the model for the specifics of the territory of these countries. While the “Šimák - basic model” of crisis management is based on the generalized long-term experience of developed countries, the comprehensive process of solving crisis phenomena is much more complex. In addition to the type of crisis phenomena, it is also necessary to consider their intensity and the environment in which they occur. The “Šimák - complex model” is based on the basic model and is extended in such a way that it can adapt to the conditions and solve a probable crisis phenomenon. The complex process of solving crisis phenomena creates conditions for linking the prevention of serious natural hazards with the planning documents of local government bodies [21]. In practice, it is important to focus on the overall analysis of vulnerability and the structural causes of the emergence of crisis phenomena, as a natural disaster, even of a small scale, can have a significant impact on the population and nature with a long-time duration of the entire recovery phase. In contrast to the basic theoretical model, the complex procedure for solving crisis phenomena is relatively detailed, which may result in a loss of flexibility and a reduced ability to respond operationally (for example, at lower levels of crisis management).

The “Ristvej model” of crisis management is similar in many respects to the “Šimák - basic model” of crisis management from the point of view of the selected criteria in the evaluation table. However, the difference lies in the understanding of the recovery phase, which in this model is understood as resolution and reconstruction. Resolution and reconstruction are seen as an extension of the phase of reaction to the crisis phenomenon, as these activities already begin in the reaction phase. The resolution and reconstruction represent the restoration of the basic functions of the system, while the recovery phase also includes activities related to the restoration of the entire activities of society the original stabilized (pre-crisis) state. A limiting factor for the use of the model in the response phase is the mixing of activities in the response, resolution and reconstruction and recovery phases.

## 5. Conclusions

Not all approaches and models can be applicable to diverse crisis phenomena and in various regions of the world. Each of the shortlisted crisis management concepts and models has its own specific status, principles, and environment in which the individual phases of crisis management are applied. The crisis management system must respect the specificities of the principles as well as the legal environment and historical experience of the countries in which it could potentially be applied. An integral part of the crisis management system must be its executive branch, whose members must be able to deal with even the most complex crisis phenomena. The various bodies and institutions of the executive branch of the crisis management system may include: (1) professional staff (members of rescue units and specialised organisations, members of the armed forces used to deal with the aftermath of a crisis and members of legal entities, whose activities and professional focus are the same as those of the staff of the relevant crisis management organisations); (2) non-professional staff (voluntary employees and employees who have been subject to a labour obligation under a special law).

The crisis management executive must be able to intervene immediately at a specific location [22] with the necessary human and technical capacity and appropriate technology [23]. It is essential that all crisis management actors have clearly defined competences to be able to intervene in any environment. The effectiveness and efficiency of emergency responders in the response phase of crisis phenomena is contingent on the existence of capable responders in individual countries, while the very applicability of crisis management concepts and models is also valid. The capacities necessary to deal with crisis phenomena must be trained and prepared in the prevention and crisis planning phase [24]. Their deployment and the coordination of their activities are part of the response phase, with the emphasis on effective and efficient handling of crisis phenomena.

The assessment of selected concepts and models of crisis management can be considered as contributions of the study. Through analysis and comparison, theoretical bases for increasing the effectiveness of crisis management processes were identified, with emphasis on activities in the phase of response to crisis phenomena. However, there is a need for further research, such as optimization of the organization and decision-making processes at the local government level. Emphasis should also be placed on creating the most effective environment for the cooperation of all those involved in the crisis management process.

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