

PROPOSAL FOR A MODEL OF EFFECTIVE REACTION TO NATURAL DISASTERS IN THE TERRITORY OF SLOVAKIA

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Abstract: The forecasting of natural disasters is more complicated than other crisis events. It requires the full use of special forces and means, which are intended to solve them. Crisis managers and many authorities or institutions are involved in the process of solving crisis events. They are exposed to psychical pressure because each phase or reaction must be made promptly and effectively. The authors focus on issues of risk and crisis management in the public sector in their research activities at the University of Žilina. The aim of this article is to propose a well-functioning and effective reaction to natural disasters in Slovakia. This model is proposed with schematic drawings illustrating the activities in each phase of reaction to a natural disaster. The model is based on international past experiences and various laws or ordinances of multiple ministries for the Slovak crisis management system. This article points to possibly optimizing the decision-making processes at all levels of crisis management, in particular to improve the local government level.

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Introduction

Natural disasters have a specific status in the crisis management system. They can interfere with a lot of people and they can have adverse effects on considerably large amounts of territory. Their implications have negative impacts not only on humans and nature, but also on material and cultural value, which are located on seriously threatened territory. The functionality and relative stability of the Slovak economy may be endangered and disturbed during extensive natural disasters. Each phase of reaction to natural disasters has importance within it to minimise negative consequences. Fast decision-making processes are getting to the forefront at the central government level and the local government level. The aim of these processes is the optimization of these decision-making processes.

Literature review

Ishikawa (2006) writes that crisis events caused by natural factors are related to the Chaos Theory. A metaphorical example of Chaos Theory is the butterfly effect which points to moving the wings of a butterfly on one side of the planet can cause a hurricane on the other side planet over time. In essence, there are relatively non-serious events that can trigger crisis events, and those that follow. A prerequisite for effective crisis management is an understanding of the public sector, its purpose, culture and the ongoing processes within it. Reactions to crisis events have to be realistic and especially functional. Crisis managers and other authorities apply different strategies and methods to stop further deterioration. Mitigating the negative consequences of crisis events requires a commitment to a functional approach to their solution. Throughout the world, a number of basic activities are known to help crisis managers and authorities in dealing with crisis events. According to Drenman (2015), the structures of the responding organizations (centralization, decentralization and policy of presidency) should reflect changes and challenges global safety environment. The importance of collecting and evaluating information and facilitating communication has its foundation in crisis events solutions. There must exist mechanisms available to the crisis managers to manage networks in times of crisis (establishment of a coordination center, horizontal coordination mechanisms and monitoring of performance indicators).

In order to design an effective model of reaction to natural disasters, it is necessary to know and understand the patterns and relationships between valid in complex crisis management models.

There are several models and concepts of crisis management in the world. According to OECD Risk Management Expert Baubion (2013), crisis management consists of three basic phases, those are crisis preparedness (before the crisis), reaction to damage (during the crisis), and feedback (after the crisis).

Crisis management is one of the basic tasks of the NATO. Marinov (2011) has developed a Strategic Crisis Management Concept within NATO to make an adequate reaction to emerging crisis events of a

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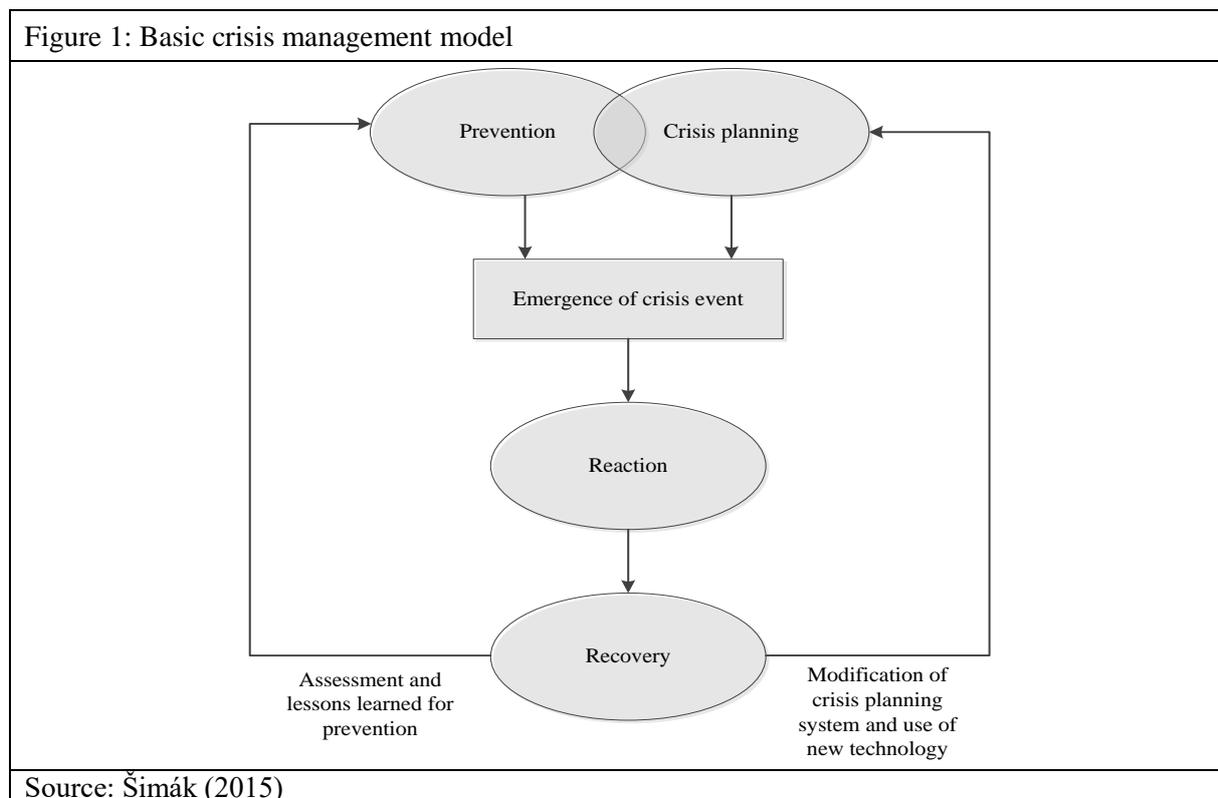
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natural or military nature. The model assesses the actual situation and develops a comprehensive reaction through a six-phase crisis management process: indications and warning, assessment, reaction, planning, execution and transition. This model enables the crisis staffs and committees within the NATO institutions to coordinate their work and provide information to the North Atlantic Council. Phases of time and organization are not exactly given. They can overlap with each other and their lengths depend on the particular situation.

The new relational model of crisis management is based on a holistic approach. This model presents crisis management as a continuous discipline using clusters and non-linear elements. Prevention and preparation for crisis events are just as important as activities that need to be carried out in the reaction phase. Feedback has an important role in implementing new elements in the preparation and management of future crises. The non-linear structure of the model should not be perceived as successive steps. Individual elements of the model are a set of interconnected groups of crisis management (Jaques, 2007).

In poorer parts of the world, crisis management models are tailored to the financial, material and personal capabilities of the countries. For these countries, a favorable model is available to allow a smooth transition from the general crisis management to risk management. The main objective is sustainable development. Hamani et al. (2013) writes the model of crisis management in African countries is a form of integration of local government and community located in a threatened area. The main objective of the model is to improve the resilience and cooperation of the civilian population in response to the natural disasters. The model provides relevant standardized information for each type of disaster, for example floods, earthquakes and landslides. The overall efficiency of the model is conditioned by rigorous territorial analysis.

According to Šimák (2015), two crisis management models exist for the conditions of Slovakia. The basic model consists of four crisis management processes – prevention, crisis planning, reaction and recovery.



In Figure 1 we can see the basic crisis management model. These particular time-bound and content-bound phases contain individual linkages and sequences. General principles are applied in each phase. The prevention and crisis planning phases are both based on the principle of whose importance is important in the preparatory period (relative peace conditions). In the case of greater complexity and effectiveness in the prevention phase, the crisis planning phase may be less extensive. The reaction

phase is characterized by the pressure on the crisis managers. This pressure can be caused, in particular, by a lack of time and the absence of the forces and means necessary to resolve the crisis. The final phase of the basic crisis management model is recovery. In practice, it usually takes place in several stages. Recovery provides the opportunity to implement new organizational, administrative and technological elements for the prevention and crisis planning phase. The efforts are then an overall improvement in crisis management (Šimák, 2015).

The second crisis management model is much more practical to resolve specific crisis events. Apart from the type of crisis events, the model also takes into account the strength and environment in which the model may be applied. This model is based on the basic model and it called the extended model. It can adapt itself and solve many specific problems. The most important step is to identify and assess all actual risks and threats. Subsequently, crises and crisis scenario prognoses are processed. The primary objective of prevention is to prevent the emergence of adverse effects of crisis events through various measures and activities. A separate and no less significant phase of crisis management is crisis planning in which crisis plans and emergency plans are processed. As Sanseverino-Godfrin (2016) writes, the protection of society has created preconditions for a link between the prevention of serious natural hazards and urban planning documents.

According to Ostrowska (2014), risk monitoring is a process that verifies the value of crisis factors and their acceptability levels. Each phase of reaction to emerging crisis events is because of non-effective prevention and crisis planning. First of all, it is necessary to warn the population and to notify specific persons by activating the warning and notifying network. As Sullivan et al. (2011) points out, these networks ultimately support the rescue work and they are elemental parts of the reaction phase. Technical means for warning and notification may be of a different character. The Ministry of the Interior of the Slovak Republic Ordinance no. 388 (2006) about the details of ensuring the technical and operational conditions of the civil protection information system regulates the scope of warning and information centers.

Warning the population and notifying persons in the conditions of Slovakia is technically ensured by a network of sirens, radio and television broadcasts, local information means such as through municipalities and cities, automated notification systems and public electronic communications networks. Reaction to crisis events is directly linked to the implementation of the necessary measures. This important phase is carried out by components of the Integrated Rescue System and by the constituents of legal persons and businesses owning premises in which the crisis events arises. Activities of the institutions of crisis management system are included in Act no. 42 (1994) regarding the civil protection of the population.

The last phase in the basic and practical model is recovery. Tasks and activities fall within the responsibility of a statutory representative of an institution that has been affected by the negative consequences of the crisis events. In addition, recovery can be carried out by forces and means that have participated in rescue services. As Cutter et al. (2013) writes, it is important to focus attention on the overall vulnerability analysis and structural causes of the emergence of crisis events. Natural disasters, even of a lesser extent, can have a significant impact on the population and on nature over a long period of time. Feedback has a great importance in all crisis management models. It represents a means of improving the quality of crisis management at various levels (Šimák, 2015).

If we have to propose a model of effective and efficient reaction, we need to know the organizations and activities of the crisis management institutions in Slovakia and abroad. In Slovakia, Integrated Rescue System was established in 2002 as a result of the experience of the European Union. Its main purpose is raising the quality of rescue activities. According to Act no. 129 (2002) the Integrated Rescue System provides fast use and coordination of forces and means of rescue systems in the case of the danger of crisis event formation or during crisis events. Like in Slovakia, in the Czech Republic, the Integrated Rescue System was also established. Its organization and tasks are described in detail in Act no. 239 (2000) about the Integrated Rescue System. In Germany and Austria, the individual Provinces are responsible for solutions to crisis events. Each Province has special offices and special crisis management legislation (International CEP Handbook, 2009). While, the protection of the Swedish population and their property is ensured by the Sweden Fire Rescue Service (International CEP Handbook, 2009). Several experts consider crisis management in Sweden is one of the most advanced and most efficient crisis management system in the world (Šimák, 2015). Edwards (1998)

describes the independent FEMA agency (Federal Emergency Management Agency) which provides an immediate response to crisis events in the United States of America. Another specific example is the Russian Federation where the Russian Ministry of Emergencies has a significant status. The main task of this ministry is to organize rescue services to crisis events in the territory of the Russian Federation.

Some states have signed agreements on mutual cooperation and assistance in sending rescue teams to other states. Slovakia's Contractual System for the solution of crisis events has signed and ratified with several countries, for example Czech Republic, Poland, Hungary, Austria, Slovenia, Ukraine, Croatia, Montenegro and the Russian Federation. Agreements and Memorandums of cooperation are also signed with the United Nations and European Union (Slovakia Contractual System, 2018).

Data and methodology

Aim of this article is to propose an effective model for the reaction to natural disasters in the territory of Slovakia. This model should be implemented and validated for the conditions of Slovakia. It specifies the tasks of the competent authorities and institutions in the whole crisis management system with an emphasis on the local government level.

The methodology is based on an analysis of crisis management models in countries and organizations in the world. The basis for the analysis are the six crisis management systems and reaction for crisis events in the surrounding countries, as well as the United States of America and the Russian Federation. Inspiration for the creation of the reaction model in Slovakia is the rescue services of developed countries. Analyzing crisis management legislation and analyzing competencies at the local government level is very important for crisis management reaction. Consistent analysis and synthesis on the basis of information obtained and evaluated determined the subsequent process modeling. This method was justification especially in the process of summarizing and evaluating the collected facts and legislative documentation in the field of crisis management.

Results and Discussion

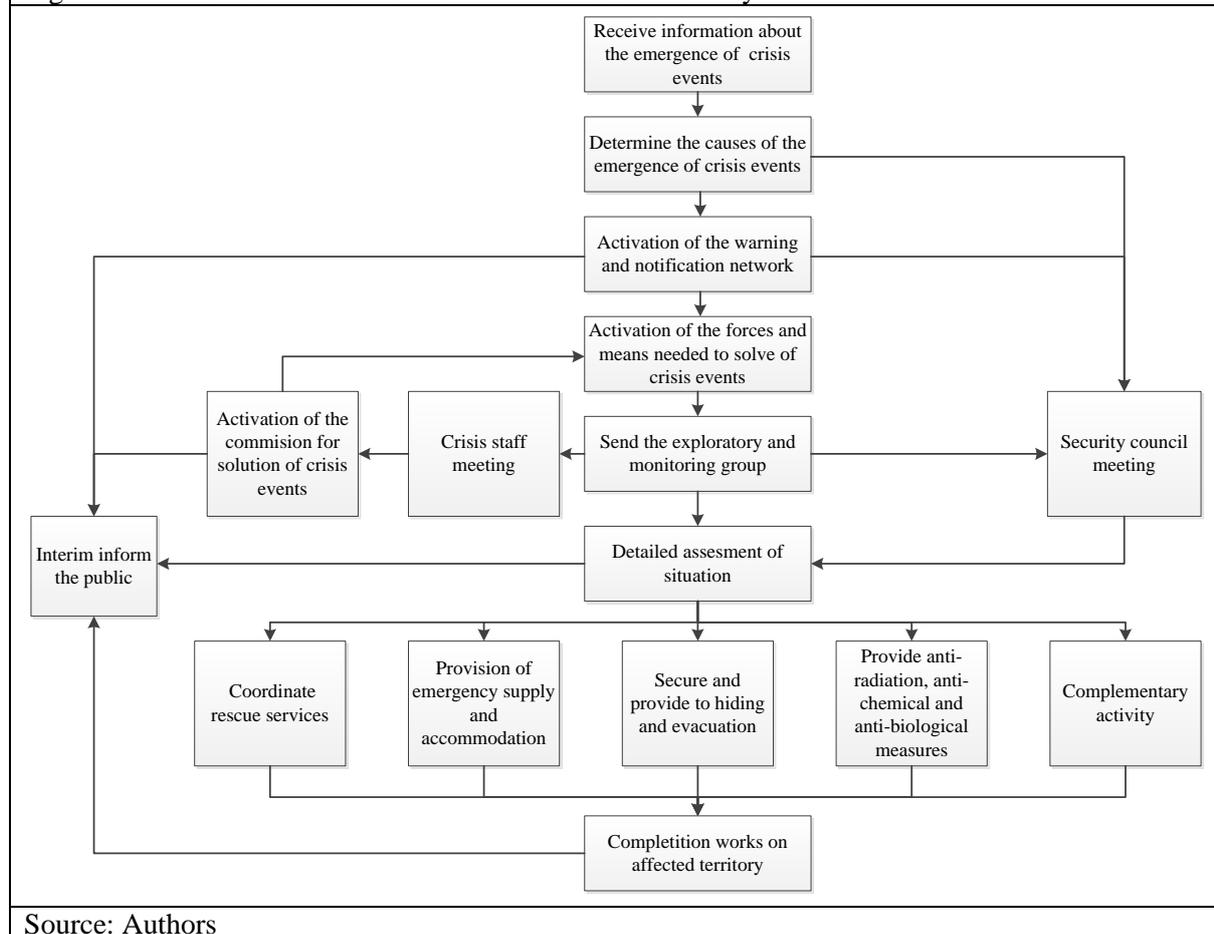
It is not possible to prevent the occurrence of crisis events despite consistent preventive measures and extensive crisis planning, including natural disasters (flood, fire, earthquake, gales, landslides, etc...). It is essential to correctly identify the causes of the crisis events for an effective reaction. Nature is the most frequently cause of these events which can be started up by the action of one of the four basic elements (earth, fire, water, air) or their combination. The existence of geological and geographic conditions and weather conditions limited the creation of crisis event forecasting and predictions to certain extent. In addition, the causes of their occurrence may be of an anthropogenic character. The negative effects of humans on nature (inappropriate treatment of nature, uncontrollable felling of trees in existing forests, uncontrollable exploitation of natural resources) can result in crisis events emerging. This sphere is even more problematic in crisis events forecasting, considering the unpredictability of human behavior.

Adopting effective measures to natural disasters requires knowledge of the various relationships and patterns between individual institutions and organizations in the Slovak crisis management system. The complex organizational structure has precisely defined roles for all elements and entities. This structure has serious importance in the reaction phase. Figure 2 shows the model of reaction to natural disasters in the territory of Slovakia. The different institutions and the activities of these institutions are very important across the reaction system. The definition and determination of the all the people involved responsibility is essential to assumptions made for a coordinated reaction. All entities must understand their position and function in the crisis management system.

Figure 2 shows a detail reaction phase in the conditions of Slovakia which begins to receive information about emergence of crisis events. To receive and record important information is the responsibility of the Integrated Rescue System Coordination Center or the local government level authorities. It is necessary to determine the causes of the emergence of natural disasters. The Security Council must be urgently convened at different levels by territorial competence (state, regional and district). According to the Constitutional Act no. 227 (2002) about state security in times of war, war status, exceptional status and emergency status, as amended, the Security Council tasks are defined. The Security Council evaluates the security situation and prepares proposals for measures to safeguard

safety and imposes obligations on other state competent authorities or legal and natural persons within their territorial competence.

Figure 2: Model of reaction to natural disasters in the territory of Slovakia



Source: Authors

Warning the population and notifying the rescue forces are carried out by activation of the warning and notification network. This network needs to be regularly examined and maintained. The activation of the forces and the means necessary to resolve crisis event is inevitable to distinguish how these activities are carried out. The legal and natural crisis personnel of the Integrated Rescue System assign forces and means (executive elements of Integrated Rescue System, work obligation and providing physical means). This is followed by sending the exploratory and monitoring group to the places where crisis events originated. Preliminary exploration and monitoring is carried out by land or by air. Furthermore, the Mobile Analytical Detection Group, is part of the exploratory and monitoring group. Important tasks of these groups are characterized by the Ministry of the Interior of the Slovak Republic Ordinance no. 523 (2006) about details to rescue services securing and organizing civil protection forces.

The meetings of Crisis Staff are extremely important and repeated several times throughout all reaction phases. The status, establishment and composition of Crisis Staffs are described in Act no. 387 (2002) about the state management in crisis situations outside times of war and war status. Crisis Staffs are not established but are created by actual situation at different levels (state, regional, district and local). Commissions for the solution of crisis events are part of Crisis Staff. These Commissions are activated by the character of crisis events. Detailed assesment of the situation may already be followed after the Security Council meeting or the evaluation of information from the exploratory and monitoring group. The aim of this phase is to correctly determine tasks and activities. The main purposes are to minimise of the loss life and minimize the damage to property and the environment. According to Act no. 42 (1994) about the civil protection of population, the tasks for the solution of natural disasters include:

- coordinating rescue services,
- provision of emergency supply and accommodation,
- securing and providing shelter and evacuation,
- providing anti-radiation, anti-chemical and anti-biological measures,
- complementary activity.

The final step is completion work on the affected territory and the subsequent withdrawal of forces and means who participated in rescue services. Interim information for the public of the affected territory is one the most important phases in the proposed model. This phase occurs not only during the reaction phase but also after the end of the reaction phase. It is significant to differentiation between true information and distorted or degenerated information. Media and designated concrete persons for communication with media must inform the public objectively and factually. Fear and panic of civil population must be limited. Improving access of factual information to the public (for example about evacuations) is needed in risk areas. The resource of the information system and its means have substantiation on affected territory. According to the Ministry of the Interior of the Slovak Republic Ordinance no. 599 (2006) about the related expenditure of civil protection from state budget, it is possible to make a claim on expenditure for rescue services. These financial compensations are made after rescue services.

Conclusion

The quality improvement and ensuring of crisis management in the public sector require the existence strong relations at both the horizontal and vertical levels. Slovakia has established relatively coherent and comprehensive crisis management systems for solving crisis events associated with natural disasters. Crisis management authorities are responsible for their preparedness and reaction to crisis events. Decision-making processes must be better coordinated. Effective reaction is directly proportional to the quality and quantity of staff resources. The main aim of the proposal for the model of the reaction to natural disasters in the territory of Slovakia is the analysis and optimization of information flows in the future.

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