FUNCTIONING OF THE CRISES MANAGEMENT SYSTEM AT THE COUNTRY AND COMMUNE INCLUDING THE ASPECTS OF TRANSPORT

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Abstract – This article discusses the problems of the crisis management system, with particular emphasis on the county and commune levels, along with the aspect of transport as part of crisis response. The aim of the work is to present the essence of the system, its determinants interdependent on the dynamics of crisis events, which should be taken over by means of planned actions. The crisis management system is imperfect, its activity is ineffective due to faulty organizational solutions, incomplete staffing of jobs, incomplete legal regulations and insufficient financial, information, human and material resources.

The work uses both quantitative and qualitative methods, such as: system analysis, cause-and-effect analysis, statistical method and synthesis. The results of the pilot studies were presented and old and new problems were presented. Moreover, practical solutions were proposed to improve the crisis management system. Nevertheless, not all problems are presented in this paper. The spectrum of the issue, its complexity and the changes announced by the Polish government indicate a further need to raise this issue on a scientific basis.

Key words – crisis management, system, transport, smart city

JEL Classification – I18, Z30

INTRODUCTION

When considering the concept of crisis management, it is necessary to understand the essence of threats, the materialization of which determines the actual functioning of the crisis response system. What exactly is a threat? The word itself in English means threat. It is described by specialists in the field of security as an event caused by random (natural) or non-random causes that adversely affects the functioning of a given system or causes adverse (dangerous) changes in its internal or external environment [1]. What can you understand by this? A threat is, in the simplest possible terms, an undesirable effect that may result in some losses. Next, it is worth focusing on the terminology: "vulnerability". This term denotes flaws or gaps in an organization's physical structure, hardware, software, management, and administration. Compliance means a structure that is not resistant to threats. Vulnerability is a disadvantage, and the disadvantage is insufficient protection, which most often stems from insufficient resources devoted to security.

Due to various situations affecting the state, various institutions have been established to meet the challenges that have arisen. However, there are also exceptional situations, hereinafter referred to as crises, which cannot be dealt with normally. In order to effectively counteract them, a crisis management system was created, the holistic operation of which includes four stages: preparation and prevention, including the planning cycle, and response and reconstruction, which make up the implementation cycle.

The assessment of the functioning of the crisis management system is influenced by various crises and crisis situations, it should be remembered that every crisis is a crisis situation, but not every crisis situation has the features of a crisis. Threats such as multi-surface fires, precipitation floods, and chemical

contamination do not have rigidly assigned ranges. These situations are difficult to predict, but they can be effectively counteracted. It happens that they are vast territorial, they cover more than the area of one commune or county. It is the commune and county level that is closest to the citizens and is responsible for the first reaction to a given threat to the civilian population.

Crisis management itself relies on year-round availability in the event of security incidents. Crisis Management Centers, services, guards and institutions are on duty all year round to take appropriate actions to neutralize threats, hence the idea of crisis management can be described as an exemplification of the smart city concept. A concept aimed at improving the quality of public services and, more broadly, the standard of living of citizens.

1. RESEARCH PROBLEM AND METHODS

The aim of the article is to present the opinion of system practitioners regarding its current state, including the aspect of transport, and to present the required directions for the development of the crisis management system in Poland.

The main research problem was formulated as the question: What influences the effectiveness of the crisis management system? On the other hand, the research hypothesis is as follows: The crisis management system is imperfect, its activity is ineffective due to faulty organizational solutions, incomplete staffing of jobs, incomplete legal regulations and insufficient financial, information, human and material resources.

In order to solve the research goal, the following quantitative and qualitative research methods were used:
– system analysis, focused on the crisis management system, with particular emphasis on the commune and county level,
– cause-and-effect analysis used to identify and explore the causes of crisis management problems,
– a statistical method leading to the presentation of research results,
– a synthesis enabling the approximation of practical conclusions,
– the analogy was used to explore the similarities between the issues of crises management systems at the county an commune level,
– proprietary diagnostic survey, carried out on a selected target group related to the studied issue, a group of 11 people.

A very important element of the work is the preliminary research carried out among employees of communal and county crisis management centers in Poland. The research population was selected on the basis of random selection, it amounted to 32 commune and county centers. The research sample that answered the questionnaire was n = 11. The survey questionnaire was based on twelve questions. These were open, closed, adjudicated and conditional questions. The respondents were informed that the survey was anonymous and participation in it was voluntary. For statistical reasons, only data were collected from them on the level of crisis management subject to the study, the size of the town, education and seniority in crisis management structures. The research itself was conducted in the form of stationary, telephone and e-mail correspondence. The activities conducted were aimed at creating a foundation and obtaining the opinion of specialists in terms of building a future doctoral dissertation.

2. THE ESSENCE OF CRISES MANAGEMENT

Crisis management is the activity of public administration bodies that is an element of national security management, which consists in preventing crisis situations, preparing to take control over them through planned actions, responding in the event of crisis situations, removing their effects and restoring resources and critical infrastructure.

A crisis situation is one that adversely affects the level of safety of people, property to a large extent or the environment, causing significant restrictions in the operation of competent public administration bodies due to the inadequacy of the resources and resources available.

Critical infrastructure - systems and their functionally related objects, including building structures, devices, installations, key services for the security of the state and its citizens, and for ensuring the efficient functioning of public administration bodies, as well as institutions and entrepreneurs.

Crisis management is a broad concept that has undergone many changes over the years. In the simplest terms, crisis management is closely related to national security as well as international security. The Crisis Management Act itself of 2007, which has recently been amended, defines crisis management as: planned activities, reacting in the event of crisis situations, removing their effects and restoring resources and critical infrastructure [7]. This act defines the bodies, tasks and procedures in the field of crisis management, financing of tasks and planning documents [8].

The very concept of crisis management comes from many areas, including strategic management, organization theory, as well as behaviour in the organization, as well as from the field of public relations and strategic communication [9]. In the

opinion of the author of the work, there are noticeable differences in the understanding of crisis management from the Polish perspective and from abroad. The author noticed them during a query of industry literature. In English-language works, the concept of crisis management refers to a wider spectrum of spheres of life, it is in fact an interdisciplinary issue. In Poland, on the other hand, it is defined in relation to state security and various types of threats to citizens.

The individual levels of crisis management consist of many levels that create an inherent whole. And so, the communal, county, voivodeship and national level constitute a holistic crisis management system. According to P. Sienkiewicz, a system is any complex object distinguished in the studied reality, constituting a whole created by a set of elementary objects (elements) and connections (relations) between them. Systemic views appeared not only in philosophical reflection (holism, dialectical materialism), but also in sociology (e.g. functionalism), psychology ("Geshtalism"), economics, humanities (structuralism), organization theory and cybernetics [10]. it is a vast and extensive system, it has many interdependent institutions, there is no single approach in its interpretation and scope of activities, but there is agreement as to the territorial division of crisis management centres, down to the central - national level.

Table 1. The structure of crisis management in Poland [11]

Administrative level	Crisis management body	Opinion and advisory body	Crisis Management Center
National	Council of Ministers, Prime Minister	Government Crisis Management Team	Government Security Center
Departmental	Minister managing a department of government administration, Head of a central authority	Crisis Management Team (ministry, central office)	Crisis Management Center (ministry, central office)
Provincial	Voivode	Provincial Crisis Management Team	Voivodship Crisis Management Center
County	County Executive	County Crisis Management Team	County Crisis Management Center
Communal	Mayor, Mayor, Mayor of the city	Communal Crisis Management Team	There may be (there is no obligation to establish) communal (municipal) crisis management centers

This table does not present all entities that may be considered part of a multi-tier crisis management system. First of all, the body responsible for crisis management in the Republic of Poland is the Council of Ministers, represented by the Prime Minister. In urgent cases, crisis management is carried out by the minister competent for internal affairs, who immediately notifies the Prime Minister of his actions. Opinion-giving and advisory bodies function at all levels, such as the Government Crisis Management Team, which advises crisis management bodies in the decision-making process. Moreover, crisis management centers at the commune level are optional, they do not have to be established. Such a situation creates a field for discontinuity of operation and discontinuity of information flow, which calls into question the effectiveness of the entire system.

The crisis management system is based on the organization, decision-making and management of forces and resources in order to implement organizational measures taken in connection with the occurrence of a crisis situation. The Government Crisis Management Team (RZZK) itself includes:

- Prime Minister-Chairman of the Team,
- The Minister of National Defense and the minister responsible for internal affairs - deputy chairman,
- Minister of Foreign Affairs,
- Minister Coordinator of Special Services (if appointed),
- Other government administration bodies as needed.

The Secretary of the Government Crisis Management Team is the Director of the Government Center for Security. The Government Crisis Management Team may debate both in public and in secret. The Center provides services to the Council of Ministers, the Prime Minister, the Team and the minister responsible for internal affairs in crisis management matters, and serves as a national crisis management center. The managing body at the national level has at its disposal

a planning and coordinating unit in the form of the Government Security Center [12]. It is subordinate to the Prime Minister and is obliged to provide round-the-clock services for the national crisis management center, as well as cooperation between Poland and other foreign entities in the area of security, crisis management and rescue. In addition, it undertakes activities in the field of civil planning, creating crisis management plans, monitoring threats to state security, and creates an information policy based on counteracting information warfare waged by centers of power hostile to Poland.

The circulation of information is at the heart of the proper functioning of the Crisis Management System. The lower-level administration, together with an adequate crisis management center, notifies the authorities at the higher administrative level about the situation and actions taken. Therefore, if there is a threat in the county, the task of the county crisis management center is to inform the head of commune and the latter provides a full report on the event to the competent voivode and the mayor, whose task is to apply appropriate measures (included in the report) in his the commune. It is easy to see here how important the division of forces and resources into particular sectors is. The information is provided to the relevant decision-making bodies, and their task is to prepare a crisis management plan, its approval and the implementation of the measures provided for therein in their area. Moreover, at each level there is an organizational unit responsible for crisis management. The task of such a unit is primarily to obtain information about threats and their assessment, continuous monitoring of these threats, as well as risk assessment, forecasting the state of development of threats in the area it is subject to, and using this information to develop a crisis management plan [13].

Pursuant to the Act of March 11, 2022 on the defense of the Fatherland, the Armed Forces may take part in combating natural disasters and eliminating their consequences, anti-terrorist activities, activities in the field of property protection, search activities, rescue or protection of human health and life, and defense of cyberspace, clearing areas of military explosives and hazardous materials and their neutralization, as well as in the implementation of tasks in the field of crisis management.

The military telecommunications system, in the event of having technical capabilities, may be used by: public administration bodies to enable cooperation in the field of state defense or security, in situations of special threats, including war, crises and combating natural disasters - at the request of these entities.

3. MEANS OF TRANSPORT

Floods are the most common natural disasters in the world, causing enormous damage. Moreover, extreme flood phenomena will occur more and more frequently due to climate and land-use changes, also in Poland. As a result of unusual events (e.g. floods), managing the transport system is extremely difficult. Then it becomes necessary to use the infrastructure in a particularly rational and effective manner, so that due to the exclusions (e.g. flooding of the road, flooding of neighboring roads, preventive road closure) of its endangered sections, lower accessibility and changes in the network load, there is no transport exclusion, which will affect maybe on the safety of the population and the state of the economy [2]. Floods can lead to the complete closure of roads to traffic, contribute to the evacuation of areas at risk and at the same time consume huge financial resources. These events may also cause, inter alia, an increase in fuel consumption, delays, an increase in the number of accidents and generally significantly affect the efficiency of the transport system [3].

Crisis situations are random phenomena, leading to a direct threat to the health and life of humans and animals. At the same time, they can cause a risk of material damage.

While in most cases we have no influence on the emergence of crisis situations, we can prepare for them properly in order to minimize the risk and potential losses.

The basic ways of protection in case of crisis situations include:
- creating infrastructure to counteract the spread of the crisis (protection of facilities, flood embankments, etc.),
- educating people through appropriate lectures, information materials, training (e.g. in the workplace),
- maintaining appropriate services (rescue, sanitary and epidemiological) that will deal with rescuing the injured,
- maintaining appropriate infrastructure (e.g. hospitals, evacuation sites),
- stockpiling of food, drugs, cleaning products, etc.

In addition, transport in crisis management should be considered in the context of securing the transport of rescue forces and the vehicles themselves transporting the injured from the endangered areas. In the event of war, a situation may arise where citizens are obliged to provide benefits in kind. It is an obligation imposed by the executive body in the form of an appropriate decision, which obliges the

citizen to provide a benefit to the state. Such benefits may take the form of making the vehicle available for the purpose of saving life and health.

In the context of crisis management and rescue operations, the potential of specialized services and guards is important. The main guard that takes part in crisis response is the State Fire Service. It takes part in the threats caused by fires, strong winds, rainfall, unusual behavior of animals, or helps to fill the systemic deficiencies in helping PRMs with the expiring COVID-19 pandemic. Fire officers are repeatedly trained in providing first aid.

The State Fire Service itself has modern equipment, including:
- rescue ladders, the highest ladder in the equipment of the Municipal Headquarters of the State Fire Service is 41 meters,
- lifts from 23 to 44 meters,
- cisterns containing up to 28 tons of water.

In addition, the PSP has in its resources specialized combat vehicles, for example the GCBA 10/55/8 or the GBA 2/16 / Pr750.

The principles of disposing of fire protection units and the principles of immediate operational security of the Warsaw area after disposing of rescue resources depend on the specific event for which the forces and resources of the State Fire Service are intended. For example, trips to fires in multi-family buildings up to the second floor are carried out by two teams, while from the third floor, a specialized lift takes part in the action. It is similar in the case of local road, rail or water threats, where the scale of the forces and resources involved in the action depends on the number of people or animals injured.

As a rule, there are companies in municipalities that provide transport, construction, earthworks, winter road maintenance and specialist works, which are planned for crisis management activities in the field of risk removal as well as removal of the effects of natural disasters [4]. Each commune and each county should have transport security in the form of medical rescue teams, commonly known as ambulances. It is similar with the police crews, both intervention and road traffic. In addition, their transport vehicles should have such services, guards and institutions as:
- Emergency Energy,
- Gas Emergency,
- Water and Sewerage Emergency,
- District Heating Emergency.

From the point of view of the affected population, the logistic needs fall into three basic areas of logistic protection, i.e. supply of supplies and economic and living services, medical support and transport services. From the perspective of the rescue forces, the above-mentioned areas should additionally include maintaining the technical efficiency of the equipment and devices of those forces that guarantee the possibility of providing support to the injured. Nevertheless, it should be remembered that the formations carrying out rescue operations have their own logistic systems, which should guarantee them adequate protection during normal activities, crisis situations or armed conflicts. An important element of counteracting crisis situations from the point of view of the injured and rescue forces is securing the functioning of the critical infrastructure, which is defined as devices, installations and services, interconnected with functional relationships, key for the security of the state and its citizens, and ensuring the efficient functioning of public administration bodies, and also institutions and entrepreneurs, including:
- Energy and fuel supply systems,
- Telecommunications, information collection and transmission systems,
- Banking and financial systems,
- Food, water and medical care systems,
- Transport systems,
- Rescue systems and systems ensuring the functioning of public authorities [5].

GCBA 10/55/8 Renault Kerax belongs to the Rescue and Fire Fighting Unit no. 10 State Fire Service for the capital city of Warsaw. It has a diesel engine with a capacity of 11,000 cm3, with a capacity of 420 HP. It has a 1000 liter water tank and a 4000 liter foam concentrate.

4. OWN EMPIRICAL RESEARCHES RESULTS

This article adopts a limitation related to the scope of the pilot study carried out, which covered employees of crisis management centers at the commune and county level. The questions concerned, among others:
- assessment of the effectiveness of the crisis management system,
- reasons for the effectiveness or ineffectiveness of the functioning of the system,
- assessment of the quality of cooperation with other levels of crisis management,
- lack of appropriate crisis response procedures,
- resources and whether they are sufficient for the proper functioning of the system,
- frequency and tendencies of occurrence of given threats in the area of operation of a given center,
- proposed changes that would realistically improve the functioning of crisis management.

Fig. 1. Renault Kerax combat vehicle - GCBA 10/55/8 [6]

The overwhelming majority of respondents indicated that the crisis management system is characterized by good effectiveness in operation. This was indicated by over 90% of people who took part in the survey. One person argued that the currently proposed changes to the draft law on civil protection would replace one fiction with another with a fiction. Such a harsh assessment of a person directly related to the system at the local government level may call into question the purposefulness of this reform, and above all, the functioning of crisis management at the county level. The new draft act on civil protection and the state of natural disaster focuses on the phases of crisis management - response and reconstruction, "by streamlining the process of information flow between public administration bodies, as well as redesigning the financing model in a way that enables more effective financial aid to the victims and the reconstruction of the damaged area, or damaged infrastructure, as well as more rational use of human resources trained in the field of rescue." It also assumes minimization of the number of planning documents. It strengthens the role of public administration bodies, including the Prime Minister, the Minister of the Interior and voivodes [14]. The project provides for strengthening the role of the Government Crisis Management Team and the replacement of the ineffective Government Security Center with a new entity, the State Duty Service. the minister of the warning system, alerting and notifying the population about threats, e.g. by means of SMS, the implementation of training and exercises in the field of civil protection, as well as keeping lists of crisis management centres and contact points established at the level of voivodships, county and communes, respectively [15]. During the interviews, the majority of Crises Management Centres employees assessed the proposed solutions as insufficient and partially inadequate to the current system needs. There has been an overlapping of tasks and competences of various bodies.

Effectiveness is a non-economic concept used to characterize a project or project to achieve an intended effect. The effectiveness of actions taken is undoubtedly an important issue, and its measure is closely correlated with the concept of project success or project management success, equated with successful project implementation, as a result of which the desired, assumed result was achieved [16]. As part of the survey, practitioners of the system were asked about the reasons for the effectiveness and ineffectiveness of the system functioning.

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Table 2. Reasons for (in) effectiveness of the crisis management system (own research)

What proves the effectiveness of the crisis management system?	What proves the ineffectiveness of the crisis management system?
The most important is the personal and material database, which proves effectiveness and enables effective operation.	No execution command flow.
Good information flow between the various authorities.	No official subordination between the levels of the Crises Management System.
Reaching the injured person directly.	The Act on the Crises Management includes the voivode's recommendations, but there are no executive regulations to them, i.e. regulations.
The basis for the effectiveness of the crisis management system is the coupling of the levels of this system, which means the same knowledge of the issues and the possibility of crisis situations at the commune and county level.	In small county operating in cooperation with County Headquarters of the State Fire Service there should be a minimum of five 24-hour staff, often this is missing.
The speed of making decisions, conditioning a harmonious team of people.	In crisis situations, the system relies on the State Fire Service and Volunteer Fire Department. Acts define the tasks of entities, but do not provide tools for their enforcement.
The effectiveness is evidenced by the proper functioning of the Crisis Management Team (at the commune and higher level) and the appropriate flow of information.	There is no provision in the Crises Management Act on personal and material benefits for the time of peace and war.
The effectiveness is evidenced by a quick response to emerging crisis situations.	Lack of appropriate financial outlays.
The basis for the effectiveness of the crisis management system is the coupling of the levels of this system, which means the same knowledge of the issues and the possibility of crisis situations at the commune and county level.	Territorial Defense Forces, which are not adapted to help the injured.
	The Public Finance Act has an impact on the Crises Management. This is a negative impact. Financial resources are insufficient.
	The only act that gives the executive bodies real power is the Decree of 23 April 1953 on benefits to combat natural disasters.
	Relatively small financial outlay for the purposes related to the Crises Management.
	The plans are not used, they are not effective to get the job done.
	The lack of accessible procedures for the exchange of information between the levels of the Crises Management proves the ineffectiveness.
	From the point of view of the local government, the lack of employees due to sick leave, then there is a problem with ensuring the continuity of activities at the commune level.

The respondents indicate a broad spectrum of reasons for the effectiveness and ineffectiveness of the system. They see the concept of effectiveness as a measure of the accomplishment of tasks and goals set for their hierarchical organization. As evidence of effectiveness in terms of the system, they most often indicate the flow of information between individual levels, which improves their work. In addition, they refer to the knowledge of issues related to the broadly understood security and

crisis management, which leads to the conclusion that in this work experience and intuition in action are the basis for effective functioning. On the other hand, the reasons for the ineffectiveness of crisis management lie in the lack of appropriate executive orders, partially outdated legal provisions, including shortcomings in the already adopted and practiced legislation, and insufficient human resources required to ensure 24-hour operation of crisis management centers. Moreover, the practitioners of the system, who know the issue from the inside, emphasize the lack of appropriate financial outlays. This state of affairs indirectly affects the morale of the team, people performing statutory tasks, and at the same time affects the limits of the field of activities under obligations. In conclusion, people who are very close to the system, who are directly related to it, see and present more examples of systemic ineffectiveness than examples of crisis management efficiency. This proves that the current solutions are not perfect, and the field for work and improvement in this matter is still inexhaustible.

An important issue is the effectiveness of the crisis management system. Efficient operation in an organization can be defined as one aimed at preventing chaos and organizational deregulation. Efficiency also means using resources wisely, without wasting them. Effective action leads to the achievement of the intended goal, which is the desired state of affairs before taking action. Thus, effectiveness can be defined as operating successfully. The measure of effectiveness is the degree of approximation to the state of affairs defined as the goal. This is due to the fact that effectiveness is gradual, which is related not only to the gradation of goals, but also the existence of a chain of intermediate goals (means) leading to the end goal. Thus, the performance of a given task can be considered successful when certain milestones are met [17]. Another issue is reliability, closely related to the theory of reliability, which is a model for looking for analogies, it occurs on four levels [18]:

– a general approach assuming that human products are imperfect and unreliable, which applies to both technical and social systems;
– extensive technical systems such as Critical Infrastructure systems (using and integrating many devices and technical solutions), the reliability of which is the subject of reliability theory considerations against the background of systems theory;
– individual Critical Infrastructure devices, the reliability of which is directly discussed in the classical reliability theory;

– methods and techniques developed by the theory of reliability, so far related to the issues of effective operation of technical devices and systems, and representing a potential value for ensuring the effective functioning of organizational systems of public crisis management.

In the case of the Crisis Management System, reliability refers to, inter alia, to the quality of cooperation between the various levels. Reliability itself may be conditioned by the degree of achievement of objectives, uninterrupted access to the database, contact database and resources in various forms. Reliability is sometimes identified with ensuring the continuity of the organization's operation. Reliability is influenced by vulnerabilities which, in a negative scenario, lead to a loss of reliability and thus materialization of threats to a given organization, including the CC system. In order to counteract such situations, experts use risk matrices. They relate, inter alia, to information security. The significant value of information meant that security has become a strategic point in the activities of economic units in every fragment of the economy. Information is nowadays the company's property, decisive for the development and success on the market or failure in the pursuit of a specific goal [16]. Information is a commodity. Information has a peculiarity, distinct from items and services, in order to pass it on to one person, it does not need to be taken from another. In a sense, information is a commodity of strategic importance for maintaining the continuity of crisis management and crisis management. In order for the role of information to be as comprehensive as possible, its quality is essential. The quality of information is determined by its relevance, topicality, completeness and consistency. Information resources, i.e. databases, research information, crisis management plans, are useful when they are useful when information in circulation creates added value for the activities of a given organization.

The respondents were asked to evaluate the quality of cooperation with other levels of crisis management in terms of efficiency, effectiveness, reliability and usefulness.

Cooperation on the County - Commune Crises Management Center and County - Provincial Crises Management Center lines is assessed better, the reason for this may lie in the nature of the work of the County Crisis Management Centers, which should be ready to operate 24 hours a day, so as to ensure an undisturbed flow of data and information. In free statements, the respondents indicate a difficult flow of information outside the working hours of the Commune Crisis Management Centers.

Table 3. Assessment of the quality of cooperation by employees of the county Crisis Management Center (own research)

Level / Criterion	Proficiency	Efficiency	Reliability	Usability
Provincial	3.71	3.71	3.71	3.57
County	4.43	4.43	4.43	4.28

Table 4. Assessment of the quality of cooperation by employees of the communal Crisis Management Center (own research)

Level / Criterion	Proficiency	Efficiency	Reliability	Usability
Provincial	4.5	4.5	4	4
Communal	4	4	4	3.67

Practice shows that these entities, organizational units work during the working hours of the Commune Office. The obligation to establish an organizational unit of the commune (city) office competent in crisis management matters, with the help of which the commune head performs his tasks in crisis management in the commune, results from Art. 19 paragraph 3 of the Act on Crisis Management. On the other hand, the decision to establish a crisis management center was left to the discretion of the commune head. It should be emphasized, however, that regardless of the decision on the establishment of Commune Crises Management Center, the duties of the commune head include ensuring, inter alia, 24/7 alerting of Commune Crises Management Team members, and in crisis situations, 24/7 on-call duty to ensure the flow of information and documenting activities [19]. This aspect is indicated in the report of the Supreme Audit Office. The auditors exposed the shortcomings of crisis management, including at the municipal level. There were situations where the performance of tasks in the field of crisis management and civil defense was entrusted to one person, in addition to a part-time employee. This situation resulted in the inability to perform the duties reliably. The Commune Offices were not prepared to fulfill their statutory obligations. In the course of the conducted pilot studies, it was found that the indicated problem has still not been solved. When trying to contact persons responsible for the implementation of tasks in the crisis management spectrum, the author of the research received information that the employee was on vacation or that he was not working at this office on a given day because he did not work full-time in the commune. Responsibility for such situations, in accordance with the Act on Crisis Management of 2007, is borne by village heads, mayors and city presidents.

One of the key elements of its correct and harmonious operation is its planning. The axis of the emergency planning system is crisis management plans prepared at all levels of public administration. They are an integral part of the crisis management phases, especially the prevention and preparation phases. The legal basis for the preparation of crisis management plans was laid down in the Act of April 26, 2007 on crisis management. At that time, in relation to the planning process, the concept of the so-called civil planning, bodies responsible for its implementation, the structure of crisis response plans and procedures for their updating have been defined.

In the Polish system, the National Crisis Management Plan and similar legal acts are created at each administrative level of the state: in a commune, county and voivodship. Crisis management plans include the following elements:

1) A master plan containing:
   a) characteristics of threats and risk assessment of their occurrence, including those related to critical infrastructure, as well as risk maps and maps of threats,
   b) tasks and responsibilities of crisis management participants in the form of a safety net,
   c) a list of forces and resources planned to be used in crisis situations,
2) A team of undertakings in the event of crisis situations, including:
   a) tasks related to the monitoring of threats,
   b) the mode of mobilizing the necessary forces and resources, participating in the implementation of planned projects in the event of a crisis,
   c) crisis response procedures, specifying the procedure to be followed in crisis situations,
3) Functional annexes to the master plan specifying:
   a) procedures for the implementation of tasks in the field of crisis management, including those related to the protection of critical infrastructure,
   b) organization of communications,

c) organization of a system for monitoring threats, warning and alerting,

d) principles of informing the public about threats and methods of proceeding in the event of threats,

e) organization of evacuation from risk areas,

f) organization of rescue, medical care, social assistance and psychological assistance,

g) organization of protection against threats specific to the area,

h) a list of concluded contracts and agreements related to the implementation of tasks contained in the crisis management plan,

i) the rules and procedure for assessing and documenting damages,

j) procedures for mobilizing state reserves,

k) a list of critical infrastructure located in the voivodeship, county or commune, respectively, covered by the crisis management plan,

l) priorities for the protection and recovery of critical infrastructure.

Table 5 presents the tasks and responsibilities of the participants in the form of a safety net. For the purposes of the plan, safety nets are created, i.e. in accordance with the Act, it is a list of potential threats with an indication of the leading entity for their removal and cooperating entities. Depending on the needs, the safety net can be designed in several ways. The simplest solution is a threat net, where the entities participating in the action are grouped according to the type of threat. Such a grid can be used only in relation to one phase of crisis management (most often the reaction phase) and for organizations where there are a small number of entities, and the organizational structure and nature of the activities carried out are not too complicated (e.g. commune and county level) [20]. The leading entity is a body (institution) which, due to the scope of its legal competences, performs key tasks for the effectiveness of operations in a given phase of crisis management, most often in cooperation with other bodies (institutions) at an equivalent or lower level, not subordinated to it in terms of business (known as cooperating entities). Crisis management plans are regularly updated and the planning cycle may not exceed two years.

The role of the leading entity is to monitor the threats assigned to it, initiate actions appropriate for a given phase of crisis management and coordinate projects carried out by cooperating entities. On the other hand, an authority (institution), equivalent or lower to the leading entity, not subordinated to it in terms of service, which, due to the scope of its legal competences, supports the activities carried out by the leading entity in order to prevent the escalation of the threat and initiate reconstruction. Each crisis management plan requires approval, and so, for the National Crisis Management Plan, the decision is made by the Council of Ministers, for voivodship plans it is the minister responsible for internal affairs. County plans are accepted by the voivode, and communal by the foreman.

As part of the research, the respondents were asked whether in the course of their official duties there was a situation where in the event of a crisis situation there were no appropriate crisis response procedures. Importantly, as many as 36 percent of respondents replied that this was the case. It proves very negative for the shape and condition of the crisis management system in Poland. In addition, one crisis management employee admitted that "the effectiveness of the procedures leaves much to be desired". At this point, the results of the research can be linked to the results of the Supreme Audit Office's audit results, where it was found that the preparation of crisis management plans served to fulfill the obligation imposed by the act. These activities were not aimed at creating reliable plans that would translate into crisis management processes in the face of its actual occurrence. It happened that plans were prepared without due diligence, which in turn led to the failure to implement the assumptions outlined in the plans. This was due to a lack of arrangements with the safety net actors with whom the draft plan itself had not been agreed. Another problem was the inability to notify the Commune Crisis Management Teams outside the work of offices. In the case of county, the substitutability functioned on the basis of ad hoc contact with the County Headquarters of the State Fire Service, which, apart from the standard work of organizational units in County Heads, to this day take the role of a kind of night contact points in the event of a crisis.

For the proper functioning of the Polish system, resources are required that can effectively serve to prevent crisis situations, as well as to counteract the effects of a crisis that has already materialized. Resources are difficult to plan due to the volatility of demand, location, flow and scope of events; on a daily basis, basic resources adequate to conduct routine activities are maintained, and in the event of an increased level of threat, crisis management plans are launched, which define the resources necessary to conduct activities along with the source of their acquisition [19].

Table 3. Fragment of the safety net for the Poznań county [21]

Threats	Crisis management phases	Greater Poland Voivode	Foreman of Poznań	Commune head / mayor	CPH in Poznań	CHSFS in Poznań	State county sanitary inspector	County veterinary inspectorate	County building supervision inspector	Administrators of county rads	SMR / PAS	Crisis Intervention Center	Entities supplying electricity, gas and fuels
Cyber attack	prevention	WS	WS	WS	WS								
	preparation	WS	WS	WS	WS								
	response	WS	WS	WS	WS	WS					WS		
	reconstruction	WS	WS	WS	WS								
Epidemics	prevention	WS	WS	WS			W						
	preparation	WS	WS	WS			W						
	response	WS	WS	WS	WS	WS	W	WS			WS		
	reconstruction	WS	WS	WS			W						
Epiphytosis	prevention	WS	WS	WS									
	preparation	WS	WS	WS									
	response	WS	WS	WS	WS	WS							
	reconstruction	WS	WS	WS							WS		
Epizootie	prevention	WS	WS	WS				W					
	preparation	WS	WS	WS				W					
	response	WS	WS	WS	WS	WS		W		WS	WS		
	reconstruction	WS	WS	WS				W					
Heavy rainfall, severe hailstorms	prevention	WS	WS	W									WS
	preparation	WS	WS	WS									WS
	response	WS	WS	W	WS	W			WS	WS	WS	WS	WS
	reconstruction	WS	WS	W									WS

Legend:

W - the leading entity is a body (institution) which, due to the scope of its legal competences, performs key tasks for the effectiveness of operations in a given phase of crisis management, most often in cooperation with other authorities (institutions) at an equivalent or lower level, not subordinated to it in terms of service (called cooperating entities). The role of the leading entity is to monitor the threats assigned to it, initiate actions appropriate for a given phase of crisis management and coordinate projects carried out by cooperating entities,

WS - a cooperating entity is an authority (institution), at a level equivalent or lower to the leading entity, not subordinated to it in terms of service, which, due to the scope of its legal competences, supports the activities carried out by the leading entity in order to prevent the escalation of the threat and initiate reconstruction,

CPH - County Police Headquarters,

CHSFS - City Headquarters of the State Fire Service,

SMR / PAS - State Medical Rescue, Provincial Ambulance Station in Poznań.

Information resources are the basis on which the functioning of crisis management is based. Information resources are both an important production factor and the result of an action system. Therefore, information resources should be viewed through the prism of the information, decision-making, motivating-steering

and modeling functions [22]. The situation is different in Germany, where the federal government supports the federal states in situations of threats with a wide territorial scope in the state or in circumstances with significant importance for national security. For this purpose, it makes available its information, coordination and advisory resources. The German Basic Law sets out the legal framework for the domestic use of military force. Due to its technical resources, the Bundeswehr can be used to support defense, providing technical assistance to the police forces of the Länder in the fight against natural disasters and in particularly severe accidents [23].

As part of the pilot studies, the respondents were asked whether the indicated types of resources were sufficient for the proper functioning of the crisis management system. The question was formulated in a closed form with the possibility of multiple choice.

Table 6. Resource sufficiency in the functioning of crisis management at the commune and county level

Resource Category / Percentage of Responses	Yes	No
financial	36 %	64 %
informative	82 %	18 %
human (staff)	64%	36%
material (hardware)	55 %	45 %

The results in this aspect are quite mixed. Moreover, while conducting the survey questionnaires, the author noticed dependence in the responses between conducting research in a stationary form and remote, using e-mail correspondence and telephone calls. Employees of crisis management centers at the commune and county level assessed the adequacy of resources more critically. Overall, the results show that the systemic needs to the greatest extent ensure the flow of information, which is the basis for the functioning of crisis management. Practitioners often point to shortages in human resources, i.e. in fact personnel. I am talking about the insufficient staffing of workplaces handling matters related to crisis management. One of the county-level respondents was employed as the only person to perform the combined duties of crisis management, civil defense and military affairs. He did not work in a dedicated crisis management department, but in a completely different, in no way related to the subject of the tasks entrusted to him. Here, there is a significant correlation between human resources and financial resources, as it is the cash expenditure that determines

the number of staff and the ability to provide 24-hour service of crisis management centers.

Recently, progressive computerization is changing the face of the whole world. It is no different in the field of state security. Scientific considerations indicate that the integration of the environment of entities operating in the crisis management system is progressing through the use of IT and ICT resources (hardware, application, network and personal) to more efficiently obtain the data necessary for the proper assessment of the course of events, inventory of resource availability and consumption as well as planning and conducting actions in crisis situations [22] should be the prime focus of future system reform. In this aspect, it is reasonable to refer to systems supporting the steering, management and disposition of forces and resources in the rescue system. Speech incl. about the Command Support System of the State Medical Rescue. It operates round the clock, all year round with SLA 99.99% [23]. Similar solutions should be implemented as much as possible in IT systems integrating process resources in crisis management.

The spectrum of crisis situations that are subject to crisis management is very wide, however, efforts were made to determine which threats occur most frequently, which are the least frequent, and what is their frequency and tendency. A structured table for one of the county in central Poland is presented in table 7.

The head of the Crisis Management and Defense Affairs Department answered the questions of the author of the thesis exhaustively. He confirmed the legitimacy of conducting research on the improvement of the crisis management system. As a person with many years, over thirty years of work in structures related to broadly understood security, he was a provider of many valuable tips and thoughts. The interview was conducted in a stationary form, during the rapid changes following the outbreak of the Ukrainian-Russian war and sudden mass migration, which also significantly influenced the activities of communal and county crisis management centres.

With regard to the remaining Center of Crises Management that participated in the preliminary study, several dependencies can be noted:
- phenomena related to precipitation - floods, droughts, strong winds and tornadoes, which may be related to the progressive climate change, intensify,
- the coronavirus epidemic has been largely contained,
- outbreaks of epizootic disease are becoming more frequent.

Table 3. Threats, their frequency and tendency to occur in the county of the Masovian Voivodship

Type of threat	Frequency	Tendency of occurrence
flood	3	decreasing
drought	4	increasing
fire	3	constant
avalanches (landslides)	-	-
earthquake	-	-
strong winds	3	increasing
whirlwinds	2	increasing
chemical hazards	1	constant
radiation hazards	-	-
heating failure	1	constant
energy failure	2	constant
gas failure	1	constant
water and sewage failure	1	constant
telecommunications failure	1	constant
road disaster	1	constant
railway disaster	1	constant
construction disaster	1	constant
crash	-	-
water disaster	-	-
ecological disaster	-	-
epidemic	1	increasing
epizootic	2	constant
planting an explosive charge	2	constant
vehicle hijacking	-	-
human abduction	-	-
social protests	-	-
blockade of communication routes	1	constant
terrorist attack	-	-
other	-	-

In the context of the last issue, it should be noted that due to the growing number of subsequent cases of rabies in wild free-living animals in the Masovian Voivodeship, the Masovian Voivode by the ordinance of April 15 this year, expanded the affected area. It was introduced in the entire City of Warsaw, the City of Radom, the City of Płock and the following counties: Otwock, Mińsk, Garwolin, Kozienice, Radom, Zwoleń, Wołomin, Szydłowiec, Warsaw West, Płock, Gostynin, Płońsk, Sochaczew, Nowy Dwór, Legionowo. This year, 23 cases of rabies in free-living animals were detected in the Masovian Voivodeship. According to the ordinance issued by the Voivode, it is forbidden to:

- organizing fairs, exhibitions, competitions, shows of animals sensitive to rabies, with the exception of fairs, exhibitions, competitions and shows with the participation of dogs, cats and horses under the conditions specified by the territorially competent county veterinarian.
- organizing hunting and catching game animals, with the exception of sanitary shooting of wild boars and individual hunts without the participation of dogs and witch hunt, on the terms specified by the territorially competent county veterinarian.

Moreover, it is ordered:
- keeping dogs tethered or in a fenced area,

and cats in confinement;

- keeping the livestock, with the exception of the mulberry silkworm (Bombyx mori) and the honey bee (Apis mellifera), in circulars and closed runs;
- vaccinating cats against rabies within 30 days from the day the cat is 3 months old, and then at least every 12 months from the date of the last vaccination.

Moreover, it is obligatory to mark the endangered area by placing on its borders, near roads, pedestrian paths and parking lots, legible and durable boards with a clear inscription: "ATTENTION: ANIMAL RABY AREA". Plates and inscriptions are to be of such dimensions as to be legible from a distance of at least 100 meters, permanently marked and not subject to weather conditions. The boards should be placed on public roads or internal roads established by the competent authorities. Last year, a total of 110 rabies cases in animals were recorded in the Masovian Voivodeship [24]. These activities are to significantly contribute to preventing the spread of epizootic outbreaks to subsequent counties, as was the case with African swine fever, where it should be assessed that the infection prevention procedures at that time turned out to be ineffective.

In conclusion, in the context of the research conducted so far, in terms of various types of threats, it should be emphasized that in Poland there are no or very rare phenomena such as: avalanches (landslides), earthquakes, radiation hazards, air and water disasters or human abduction.

In order to make the research utilitarian, the respondents were asked to indicate proposed changes that would realistically improve the functioning of crisis management. Many problems were identified in the course of the talks. Nevertheless, in the opinion of practitioners, many of them are possible to be solved. One of such issues is the method of financing tasks in the field of Crises Management. One of the respondents stated that financing should come from the state budget, and not be transferred to local governments, which are already sufficiently burdened. He indicated that most of the money goes to investments and innovation, not necessarily related to Crises Management. It is also possible for the voivode to be the administrator of the money. This would allow, for example, to organize more places for Ukrainian refugees, or to provide round-the-clock duty hours at the Center of Crises Management. Another person indicated that, first of all, the implementing provisions for the Crises Management Act should be improved. Moreover, in her opinion, it is justified to increase the financial outlays for the

preparation phase, i.e. in the event of crisis situations. Due to the fact that the pilot was carried out nationwide, the respondents indicated a wide range of problem situations. And so, another person in the interview proposes to increase access to training in crisis management and increase the flow of information in the organization - from the voivodeship level directly to the municipal level. Another person sees a common problem that occurs both at the commune and county level. Namely, those responsible for Crises Management have too many tasks, they should only have these duties related to crises and defense matters.

Importantly for the subject matter in this paper, on June 14, 2022, the Minister of the Interior and Administration presented the assumptions of the new draft act on civil protection and on a state of natural disaster. The list of numerous changes, which the Polish authorities want to introduce in the system, includes strengthening the role of the Government Crisis Management Team, which is to become "decision-making" (today it deals with recommendations). The goal is to concentrate the decision-making and executive center in one place. The team will be headed by the prime minister and the head of the Ministry of Interior and Administration will be the deputy. At the same time, in place of the liquidated Government Center for Security, which, according to the government, is to disturb the order related to the division into ministries, currently responsible for crisis management, the State Duty Service will be created, but within the structures of the Ministry of Interior and Administration, coordinating the activities of the organs. Importantly, the system will be based on the provisions of the draft Population Protection Fund act, the amount of which will be linked to gross domestic product (GDP). It is supposed to be exactly 0.1 percent. GDP (currently it is approx. PLN 3 billion) and will not expire, which means that the funds will be transferred to the next year. Half of them will be at the disposal of the Ministry of Interior and Administration, and the rest - voivodes (approx. 90-100 million annually, depending on the size of the voivodeship and population). Importantly, the fund will not be covered by the provisions of the public procurement law [25]. In addition, a new entity is to be created on the basis of fire officers and rescuers - a corps of medical rescuers. In addition, an "ambulance in every commune" program is to be launched, financed by the emerging Civil Protection Fund. The act is also to simplify bureaucratic procedures. The crisis management plans functioning in communes are to replace the IT system created by the Ministry of Interior and Administration.

All these assumptions mean a kind of revolution in the functioning of crisis management at the commune and county level. At the moment, there is no bill on the website of the Polish Parliament. The coming months will surely mean many changes in the security and crisis management environment. The newly established institutions may cope with the existing problems as well as the new ones - arising from organizational changes.

CONCLUSIONS

The flood in 1997 in Poland exposed in every respect the powerlessness of the state structures, the lack of prepared forces and resources, as well as specialized equipment with which to fight this element. The degree of threat to individual towns and villages in Poland varies greatly and depends on the technical infrastructure. However, everywhere, at all levels, there is a need to apply preventive actions and have forces and resources prepared for this purpose, kept in readiness for rescue operations and liquidation of the consequences of threats. It is the duty of public administration to have systemic solutions for each crisis situation that will allow for effective crisis management. It is the state that is obliged to provide its citizens with basic conditions of protection against potential and real threats. To prevent such a situation from occurring in the future, the state has created a crisis management system as an element of internal security [26].

Crisis management in Poland has been functioning in its present shape since 2007. For over a decade, the Supreme Audit Office has found many irregularities in its functioning. Pilot studies conducted by the author of the work confirm that old problems remained unresolved and new shortcomings, so far unknown, have appeared.

The main research hypothesis: The crisis management system is imperfect, its activity is not effective due to flawed organizational solutions, incomplete staffing of jobs, incomplete legal regulations and insufficient financial, information, human and material resources has been confirmed.

The authors of the publication, using a literature search and exhaustive answers of the respondents, stated that the crisis management system is still burdened with defective organization of work, or rather frequent lack of appropriate duties at the commune level. Moreover, in the course of the conducted works, incomplete legal regulations, the lack of relevant executive regulations and legal duality were identified.

The problematic issue is the lack of resources, in particular financial and material ones. The announced organizational changes are quite general at present. At the moment, there is no draft law that would specify many aspects. All these factors confirm the legitimacy of the conducted research and the need for further work on the functioning and evaluation of the work of crisis management.

FUNKCJONOWANIE SYSTEMU ZARZĄDZANIA KRYZYSOWEGO NA SZCZEBLU POWIATOWYM I GMINNYM WŁĄCZNIE Z ASPEKTAMI TRANSPORTU

Niniejszy artykuł porusza problemy systemu zarządzania kryzysowego ze szczególnym uwzględnieniem szczebla powiatowego i gminnego wraz z aspektem transportu w ramach reagowania kryzysowego. Celem pracy jest zaprezentowanie istoty systemu, jego uwarunkowań współzależnych od dynamiki zdarzeń kryzysowych, nad którymi należy przejmować kontrolę w drodze zaplanowanych działań. System zarządzania kryzysowego jest niedoskonały, jego działanie jest nieefektywne z powodu wadliwych rozwiązań organizacyjnych, niepełnej obsady stanowisk, niekompletnych regulacji prawnych oraz niewystarczających zasobów finansowych, informacyjnych, ludzkich i materialnych. W pracy posłużono się metodami zarówno ilościowymi, jak i jakościowymi, takimi jak: analiza systemowa, analiza przyczyno-skutkowa, metoda statystyczna oraz synteza. Przedstawiono wyniki badań pilotażowych oraz zaprezentowano stare, jak i całkiem nowe problemy. Ponadto zaproponowano praktyczne rozwiązania zmierzające do usprawnienia systemu zarządzania kryzysowego. Niemniej, nie wszystkie problemy zostały zaprezentowane na łamach niniejszej pracy. Spektrum zagadnienia, jego złożoności i zapowiadane przez rząd polski zmiany wskazują na dalszą potrzebę poruszania niniejszej problematyki na gruncie naukowym.

Słowa kluczowe: zarządzanie kryzysowe, system, transport, smart city

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