

## Security and national security challenges from the perspective of the Hungarian Disaster Management

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### Abstract:

The natural and civilizational risk sources of the contemporary world have an impact on the normal operation of a state. General opinion about a state (also) depends on the answers the state is able to formulate to address these classic and modern challenges: what types of defense mechanisms will be set up, and how state bodies manage to formulate the self-defenses of the society. Any research is useful and highly appropriate that deals with the causes of catastrophes, with the actualization of the safety dimensions, or with the analysis the modern age interpretation of the living conditions of the society, with an interdisciplinary approach.

The current validity of the topic is highlighted by the fact that numerous reports have been published in the 21<sup>st</sup> century clearly pointing out that our contemporary security environment is not stable, despite of the significant technological progress.

On a general level, from the point of view of security and national security, the exposure of Hungary is continuously changing, and the risks of multiple origins and of civilizational nature intertwine via many threads. Due to the complexity of risks and the ever-stronger dependences developing among them, the various institutions of the public administration are less capable to prepare and react to new types of risks. For this reason cooperation initiatives among various professional orders, public and local administration institutions are gaining ground, just as well as bilateral treaties with neighboring countries, the strengthening of the civil protection mechanisms operating with regard to the common risk assessment procedures of the European Union, the establishment of the conditions for requesting international aid, etc.

**Keywords:** security, national security, risk. disaster management, analysis

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**Absztrakt:**

Napjaink természeti és civilizációs eredetű veszélyeztető forrásai, kockázatai befolyásolják egy ország normális működését. Az államok megítélése függ attól (is), hogy ezekre a klasszikus és modernkori kihívásokra milyen válaszokat adnak, milyen védelmi mechanizmust építenek ki, hogyan alakítják ki a társadalom önvédelmi reflexét. Minden olyan kutatás, mely a katasztrófákat előidéző okokkal, biztonsági dimenziók tipizálásának aktualizálásával foglalkozik, a társadalom életfeltételeinek modernkori értelmezését elemzi, interdiszciplináris jelleggel kutatja, mindenképpen hasznos és időszerű.

A téma aktualitását az indokolja, hogy a XXI. században több olyan jelentés került a nyilvánosság elé, melyek egyértelműen felhívják a figyelmet arra, hogy napjaink biztonsági környezete a számos technológiai fejlődés ellenére sem stabil.

Általános értelemben biztonsági és nemzeti biztonsági szempontból Magyarország kitettsége folyamatosan változik, és a különböző természetű, civilizációs eredetű kockázatok egyre több szálon kapcsolódnak egymáshoz. A kockázatok összetettsége és a köztük kialakuló egyre erősebb függőségi kapcsolatok miatt a közigazgatás egyes szervezetei külön-külön kevésbé képesek felkészülni és reagálni az új típusú veszélyekre, ezért ma hazánkban egyre inkább előtérbe kerülnek az egyes hivatásrendek, az államigazgatási,- és önkormányzati igazgatási szervek közötti együttműködések, a szomszédos országokkal kötött bilaterális egyezmények, az Európai Unió közös kockázatbecslési eljárási rendjét figyelembe vevő polgári védelmi mechanizmus erősítése, a nemzetközi segítségnyújtás-kérés feltételeinek kiépítése stb.

**Kulcsszavak:** biztonság, nemzeti biztonság, kockázat, katasztrófavédelem, elemzés

## Introduction

Due to the geographical location and characteristics of Hungary, climate change is a risk that poses an increased threat to the national economy – a risk that enforces action. Based on comprehensive analyses, in the following decades, the significantly altering heat and rain conditions, the possible shift of seasons, the increasing strength and frequency of some extreme weather phenomena places our valuables, waters, forests, agricultural produce, structures, habitats at risk, just as well as the health and the quality of life of the population.<sup>3</sup>

In the system of defense against domestic catastrophes, the Fundamental Law of Hungary, together with Act No. CXXVIII of 2011 concerning disaster management and the amendment of certain related acts<sup>4</sup> established the uniform system of prevention guidelines, tasks and tools.

This means that, in the defense mechanism, prevention as well as measures decreasing the probabilities of catastrophes triggered by risk effects of natural and civilizational origin are becoming more important. One of the effective tools for this is the risk assessment procedure; where the outcome is a disaster management classification corresponding to the specified risk level describing the threats of the settlements examined. This result provides the basis of the unified document system encompassing the the management of any disaster or emergency arising in the area of Hungary: the emergency prevention planning.<sup>5</sup>

At the end of 2012 the European Commission and NATO requested their member states to prepare, based on the national risk assessments, a comprehensive report on those more significant risks caused by natural and human factors they could face in the future and, if it is at all possible and relevant, to take into consideration the future effects of climate change and the necessity to

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<sup>3</sup> Második nemzeti éghajlatváltozási stratégia (NÉS) jelentés [Report of Second National Climate Change Strategy], (Budapest, 2013), [http://nakfo.mbfisz.gov.hu/sites/default/files/files/NES\\_final\\_131016\\_kikuld\\_kozig\\_egyeztetes.pdf](http://nakfo.mbfisz.gov.hu/sites/default/files/files/NES_final_131016_kikuld_kozig_egyeztetes.pdf).

<sup>4</sup> Hungarian Government, Act No. CXXVIII of 2011 concerning disaster management and amending certain related acts, <https://www.ecolex.org/details/legislation/act-no-cxxviii-of-2011-concerning-disaster-management-and-amending-certain-related-acts-lex-faoc129205/>.

<sup>5</sup> Hungarian Government, Act No. CXXVIII of 2011 concerning disaster management and amending certain related acts, (Budapest, 2011), <https://www.ecolex.org/details/legislation/act-no-cxxviii-of-2011-concerning-disaster-management-and-amending-certain-related-acts-lex-faoc129205/>

adopt to it.<sup>6</sup> They were asked to identify, based on the report overview, the risks and risk types that affect many member states or the various regions of member states in a similar manner.

Due to the diversity of risk factors concerning Hungary, in order to identify risk types, and to specify effects and probabilities, a multidisciplinary approach was applied. In the focus of the guidelines the methods aiming at national risk assessment as well as prevention, preparation and planning, were centered. In order to coordinate and summarize this complex task in Hungary the professional disaster management organization was appointed. The concept and the logical background of the national disaster risk assessment was introduced on the 21st of October 2013. to the management and experts of the Humanitarian Aid and Civil Protection Directorate General of the European Commission.<sup>7</sup> The methodology introduced was met by favorable feedback. It was considered exemplary that Hungary applied an integrated approach to the theory and practice of risk assessment.

### **Factors threatening security in Hungary**

According to surveys, Hungarian society pictures the content of security primarily as financial security (social security), and public security. We consider these (together with political, economic, environmental security and social stability) the non-military aspects of security. Handling challenges occurring on these fields is not a task for the military, although, in cases of catastrophes, the military can participate in the rescue and response tasks. Fields of security where response to risks and threats is mainly in the scope of the military (e.g. participation in acts of war and peace keeping) are entitled the military aspects of security. In relation to the expression *security* Hungarians selected the military security of the country only as the third most important factor. This means that the Hungarian society, similarly to security experts, does not feel the country to be under threat from a military point of view.

Among the challenges of non-military nature, environmental security has an important place, as Hungary, due to its geographical location, is most directly affected by the threats of floods and inland inundation. Apart from this, in the past years, global warming is considered as an ever more significant challenge.<sup>8</sup>

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<sup>6</sup> European Commission, Guidance on Ex Ante Conditionalities; Part II., (Brussels, 15 March 2013).

<sup>7</sup> ENDRŐDI István, Polgári Védelmi szakismeret 1. (Budapest, Nemzeti Közszerkeleti és Tankönyv Kiadó Zrt., 2015).

<sup>8</sup> IEC 31010:2009, Risk management -- Risk assessment techniques, International Standard, 2009.

Consequently, extreme weather conditions are also more frequent (e.g. violent storms, extended droughts).

Similarly to other European countries, the question of energy security has also become an issue of primary importance in the past few years (the security of the supply as well as the extension of procurement lines and resources). Moreover, Hungary is also affected by such trans-European threats as the increasing number of states where central power is considered weak. The lack of a central power can cause economic, political and social crises (mass poverty) in far-away countries. This may strengthen illegal immigration to Europe and Hungary, just as well as terrorism and organized crime.<sup>9</sup>

Hungary may tackle these challenges most effectively if the country participates in the international peacekeeping, crisis management, stabilizing and state-building missions initiated by NATO and the European Union. Presently, these third-country missions primarily involve the soldiers of the Hungarian military. However, there is an ever-increasing need for the participation of police personnel, lawyers, public administration and other experts, or soldiers with such expertise, in the elimination of non-military challenges and risks outside our borders.

### **Hungary's National Security Strategy**

National security is the security of the sovereignty and the constitutional order of a given state. It is a complex category that does not only include the military aspect, but political, economic, social, human rights, environmental and IT security as well. It strongly correlates with the security of the narrower and wider environment of the state as well as its allies.<sup>10</sup>

The definition and role of the strategy: during human history, the notion of strategy mainly concerned wars, and it primarily meant the general plan for the use of the practical means at the disposal of the military leader in order to successfully fight wars. From the second half of the 20th century the expression has become a somewhat more general term. It stood for an action plan that, in order to reach certain long term and short-term goals, elaborated on the means necessary to reach these goals, and it also included methods to be used to attain

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<sup>9</sup> European Commission, Commission staff working document; Risk Assessment and Mapping Guidelines for Disaster Management, (Brussels, 2010), [https://ec.europa.eu/echo/files/about/COMM\\_PDF\\_SEC\\_2010\\_1626\\_F\\_staff\\_working\\_document\\_en.pdf](https://ec.europa.eu/echo/files/about/COMM_PDF_SEC_2010_1626_F_staff_working_document_en.pdf).

<sup>10</sup> Balázs BOGNÁR et al., *Létfontosságú rendszerek és létesítmények védelme: Kézikönyv a katasztrófavédelmi feladatok ellátására*, [Protection of critical systems and facilities: Handbook on disaster management tasks,] (Budapest: Nemzeti Közszolgálati Egyetem, 2015), p. 149.

the targets. We must, however, make a distinction between strategy and tactics. While the latter refers to immediate, short-term steps, strategy is to define tasks for a longer period.<sup>11</sup>

### **The system of strategies concerning Hungary's security**

Security is a key notion for a state. As all activities directly concerning the security of a nation are in the scope of the governments, every state has multiple strategies for this field. The highest-level strategy of a state is normally entitled national security strategy.

It is worthwhile to take a short overview of the changes in the security policy principles of Hungary from 1990 to date. Decision 3617 was created in December 1991, then the proposed decisions 5699, 8958 and 8999 of 1992, then finally the proposed decision of 8624, which is an important milestone on the road leading to the first security policy principles. Finally, the proposed decision of 8959 of February 1993, then the following parliamentary decision 94/1998. (XII. 29) OGY on the homeland defense guidelines of the Republic of Hungary accepted on 28 December 1998. In the following periods, it was the actual reigning government to pass decisions on the actual strategy, based on these principles. This is how Government Decision on the national security strategy of the Republic of Hungary was drawn up then, in compliance with the new Fundamental Law and other cardinal laws, the government decision 1035/2012. (II. 21.) on Hungary's National Security Strategy was passed in 2012.<sup>12</sup>

In Chapter I., the Strategy discusses the security policy environment of Hungary, then, in Chapter II. it defines the place and security policy interests of Hungary in the world, as we have discussed this in detail in section VI and II.

The strategy specifically underlines that the fundamental frame of Hungary's security policy is based on our NATO and EU memberships. The Euro-Atlantic integration represents a community of values whose member states create a political-military alliance based on solidarity, and also represents a global economic-political power that can not only defend the population of their member states, but is capable of actively shaping its security environment and can contribute to the extension of international stability and security.

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<sup>11</sup> Balázs BOGNÁR et al., „A létfontosságú rendszerek és létesítmények védelméről szóló szabályozás végrehajtása Magyarországon”, [Implementation of the regulation on the protection of vital systems and facilities in Hungary,] Bolyai Szemle, Vol. XXIII, No. 2, 2014, p 105-111.

<sup>12</sup> Balázs BOGNÁR et al., Létfontosságú rendszerek és létesítmények védelme: Kézikönyv a katasztrófavédelmi feladatok ellátására, [Protection of critical systems and facilities: Handbook on disaster management tasks,] (Budapest: Nemzeti Közszerológiai Egyetem, 2015), p. 149.

Hungary embraces the values of NATO and EU as stipulated in the treaties. A significant part of our fundamental national interests is embedded in the common interests; therefore, we can reach these goals, apart from applying our own national instruments, by the means of the framework of the Euro-Atlantic co-operation too.

The corner stone of the security of Hungary is Article 5 of the North Atlantic Treaty on collective defense. The active contribution to the collective defense and security is the most important security policy obligation of Hungary. NATO's Strategic Concept assigns the directions that make the alliance capable of fulfilling its role (while adapting to the changed security environment) as stipulated in the North Atlantic Treaty (Washington Treaty) and also capable of providing defense for its member states.<sup>13</sup>

We are invested in a strong, united Europe that remains on a successful integration curve, where cohesion remains strong during economic difficulties too, and where mutual solidarity applies. We can only be successful in tackling the security challenges of the 21st century in a broad sense if these conditions are met. The defining security policy goal of our union membership is facilitating and strengthening the creation of the Common Foreign and Security Policy as well as the common security and defense policy that forms an integral part of the former. The Lisbon Treaty of the European Union strengthens European identity, furthermore it deepens integration and gives momentum to the common security and defense policy of the Union, providing a framework for joint external action and for facilitating internal co-ordination.

Hungary continues to play an active role in the crisis management activities and missions of NATO and EU, as well as in the development of capabilities required to attain these goals, both in national and in joint means. We support the development of the common security and defense policy of the European Union with observance to the obligations on the member states from the North Atlantic Treaty, the strengthening of the real strategic partnership of the two organizations and the harmonized enforcement of their military and civil capabilities.<sup>14</sup>

Chapter III sums up the security threats and challenges concerning Hungary, and their management. It states that, due to the democratic transition and the successful Euro-Atlantic integration, the security situation of Hungary is fundamentally strong. At the same time, we must count with a number of security

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<sup>13</sup> European Council, Council Directive 2008/114/EC of 8 December 2008 on the identification and designation of European critical infrastructures and the assessment of the need to improve their protection, 2008, [https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv%3AOJ.L\\_2008.345.01.0075.01.ENG](https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv%3AOJ.L_2008.345.01.0075.01.ENG).

<sup>14</sup> Hungarian Government, Government Decree No. 65/2013. (III. 8.) of the Government implementing Act. CLXVI of 2012 on the identification, designation and protection of the critical infrastructures, 2012.

risks in our closer or wider environment that represent a strategic challenge from a national point of view.

**It states that:**

- The risks and weigh of traditional threats, large-scale military clashes among states has decreased. At the same time however, there is still a danger in our wider environment for local conflicts to arise due to ethnic, religious, or other tensions.
- Our security is further strengthened by the co-operation in the European Union based on shared commitment and mutual solidarity. The majority of our neighboring countries are members of NATO and the European Union, while those without membership maintain strong relationships with these organizations via their partnership instruments. It is our interest to support them in their outreach endeavors.
- Hungary is not in possession of weapons of mass destruction. Hungary is invested in preventing the spread of weapons of mass destruction, their carrier infrastructure and well as the means of their production. Hungary is also invested in the further enforcement of the international decommissioning process, and in the effective international elaboration and regulation of the arms control.
- Terrorism will remain a significant global threat of the age that will manifest differently in time and space and in a continuously changing way, while threatening our system of alliances and our system of values. The terror threat of Hungary is low, however, we must calculate with the threat of third-country origin domestic and third-country-based Hungarian institutions.
- The notion of financial stability now has a significantly increased value ever since the world economic crisis. The stability and resilience of the economic and financial systems of Hungary is an important national interest.

**Important factors influencing security in Hungary<sup>15</sup>**

- Cyber security. The strengthening of the defense of the national critical infrastructure.
- Energy security is of key importance for Hungary. Due to the high level of import dependency.
- Organized crime.
- Drug trafficking.
- Migration.

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<sup>15</sup> Hungarian Government, Act. CLXVI of 2012 on the identification, designation and protection of the critical infrastructures, 2012.



- The appearance of extremist groups exploiting social tension in the society represent a security challenge.
- The global climate and weather change,
- The effects of the weather becoming ever more extreme,
- The depletion of raw materials and natural resources,
- access to healthy drinking water,
- Food shortages appearing in an increasingly serious form in the world.

Global environmental, civilizational and health threats occurring in the region or in Hungary do not only threaten the security and development of the country but the region as well. Due to the geographical characteristics of Hungary, the environmental and civilizational harms, floods, water and air pollution arising in the neighboring countries have an increased effect in the country. The environmental hazards have an indirect effect on the health status of the population.<sup>16</sup>

a) The protection of the natural resources and assets, increasing flood and inland inundation safety, elimination of health risks, epidemics, the maintenance of food and water safety, the elimination of pollution in the soil and in subsurface waters, the elimination of environmental damages, the management of environmental risks – these are security policy issues for Hungary as well.<sup>17</sup>

b) In order to establish environmental security, it is inevitable to ensure an increased protection of the water bases and the agricultural land, to establish the conditions for the supply of the population with healthy drinking water and genetically not modified food products and to ensure the continuity of the supply, just as well as the preparation of public health for the defense against epidemics.<sup>18</sup>

Natural and industrial catastrophes. Processes that become uncontrollable in certain industrial, biological, chemical and especially nuclear establishments may threaten or harm human health, environment, life and property security on a

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<sup>16</sup> European Commission, An EU Strategy on adaptation to climate change, (Brussels, 18 April 2013), <http://www.cbss.org/wp-content/uploads/2012/12/EU-Strategy-on-Adaptation-to-Climate-Change.pdf>.

<sup>17</sup> M. PAVLOVIC, Klímaadaptációs és kockázatértékelési kézikönyv; SEERISK projekt - „Közös katasztrófavédelmi kockázatértékelés és felkészülés a Duna makrorégióban”, Budapest, National Directorate General for Disaster Management, Ministry of the Interior, 2014.

<sup>18</sup> Tibor FARAGÓ, István LÁNG and László CSETE, Climate change and Hungary: mitigating the hazard and preparing for the impacts (the „VAHAVA” report), Budapest, 2010, [https://www.unisdr.org/files/18582\\_thevahavareport08dec2010.pdf](https://www.unisdr.org/files/18582_thevahavareport08dec2010.pdf).

large scale. The transportation of dangerous goods via road, rail, water, air and pipelines poses further risks.<sup>19</sup>

c) Hungary assigns a high priority to the effective defense of critical infrastructures necessary for the maintenance of the daily living conditions of the country and for the operation of the economic and state infrastructure.<sup>20</sup>

d) We pay special attention to the further increase of the domestic nuclear security and defense as well as the corresponding monitoring, and we support the international efforts enforcing the global frameworks of these efforts.

e) The probability of accidents can be reduced by increasing state intervention, with the extension and rationalization of the administrative authorization and monitoring activities. Based on their specialized professional knowledge and preparedness, voluntary and civil organizations have a significant role to play.

f) We must take our geographical circumstances into consideration, we must also increase multilateral information exchange and co-operation, just as well as bilateral ones concerning neighboring countries. Flash floods created in the drainage areas of the neighboring countries require a continuous, daily contact.

g) In order to ensure life and property security, special attention must be paid to the appropriate preparation of the professional disaster management bodies and of other institutions involved in disaster management, as well as to the preparation of industrial facilities.

In section IV, the strategy sums up the set of instruments for the execution of the National Security Strategy. It states that:

- The security of Hungary must lay upon solid economic foundations that, on the one hand, creates the resources of an effective security policy, and, on the other hand, increases the negotiating power of the country by means of increasing the stability of the state.
- The security of Hungary must lay upon solid social foundations as well. An organic part of this is the management of social and demographic issues, especially the reduction of extreme poverty and social exclusion.
- Efforts to strengthen the security of the country, including here the international contributions of Hungary, must lay upon broad-range national agreement and support.

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<sup>19</sup> Hungarian Government, Government Decree 219/2011. (X. 20.) on the protection against major accidents involving dangerous substances, Budapest, 2011.

<sup>20</sup> Balázs BOGNÁR et al., „A létfontosságú rendszerek és létesítmények védelméről szóló szabályozás végrehajtása Magyarországon”, [Implementation of the regulation on the protection of vital systems and facilities in Hungary,] Bolyai Szemle, Vol. XXIII, No. 2, 2014, p 105-111.

- Hungary wishes to implement their security policy goals and interests by means of an active foreign policy activity and via bi- and multilateral diplomatic frameworks and systems of relationships.

- The comprehensive management of the threats described in the National Security Strategy requires an approach from the full scale of governance. Accordingly, the close and effective co-operation and co-ordination of defense, national security, law enforcement, judicial, disaster management and civic crisis management institutions and their comprehensive frameworks capable of adopting to the security environment must be strengthened.

It is the task of every governmental institution to continuously evaluate the elements of national and international security and risks on their own fields of expertise, and to make the necessary steps to manage and eliminate them.<sup>21</sup>

- The Hungarian Defense Forces are the fundamental institution for securing the sovereignty of Hungary, and, considering their international contributions, HDF is a determining tool for the elaboration of foreign policy. The principal task of the Hungarian Defense Forces is to guarantee the security of Hungary in accordance with the Fundamental Law, as well as to contribute to the collective defense of our allies.

- In order to fully and effectively execute international peacekeeping and crisis management tasks, the appropriate civil component must be added to the available military organizational elements and capabilities.

- One of the elements of this is the strengthening of the civil–military co-operation that has a significant role in the crisis management taking place in the framework of international operations.

Hungary has to increase capabilities that operate complex prevention systems, which can react quickly, efficiently and in an organized way in case of natural or industrial catastrophes in order to protect lives in the population, defend basic material goods and minimize unfavorable outcomes.<sup>22</sup>

Special attention must be paid to cause the least obstruction to the daily life of the population and to the activities of the production units during any reaction to events. In order to achieve this, organizations concerned must have the essential tools at their disposal necessary for leadership, management and execution – these tools should be sufficient for both domestic and international use. In accordance with the international processes and demands, special attention

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<sup>21</sup> European Commission, Technical guidance on integrating climate change adaptation in programmes and investments of Cohesion Policy; Commission staff working document accompanying the document, (Brussels, 16.4.2013).

<sup>22</sup> Hungarian Government, Government Decree no. 1035/2012. (II. 21.) on National Security Strategy of Hungary, 2012, [http://2010-2014.kormany.hu/download/f/49/70000/1035\\_2012\\_korm\\_hatarozat.pdf](http://2010-2014.kormany.hu/download/f/49/70000/1035_2012_korm_hatarozat.pdf).

must be paid to the external applicability of the internal crisis management capabilities and, also, to the optimization of capability development.

It stems from an overall interpretation perspective of security that the tasks originating from the execution of the National Security Strategy concern numerous governmental and non-governmental bodies as well.

### **Security and national security challenges from the point of view of the Hungarian Disaster Management**

According to the definition of social values, we are facing issues of security or national security if the basic values of Hungary are under threat by a risk that could potentially lead to disorders in society.<sup>23</sup> Essentially, Hungary is under threat from three emergency/risk sequences of events:

- 1) events and risks that threaten the lives and health of people,
- 2) events or situations posing a risk of serious damage to domestic environment or economy,
- 3) external attack, on the security of Hungary with the potential of serious damage, or political/social effects manifesting in the form of terror attacks.

Based on the above, from the point of view of a risk assessment of Hungary, we can sum up the following essential national security interests: human (risk to life and to health), economic/environmental, and political/social. The above tasks represent a serious challenge for the Hungarian professional disaster management organization, therefore I wish to uncover, analyze and sum up the possibly arising scientific queries from the point of view of the new security risks via a comparative domestic and international introduction of the present system of tasks.

The answer to the problems cited is clear: governmental, local governmental, corporate and civilian bodies and persons must face a particularly complex set of security challenges today. For this reason we are facing a fundamental set of issues that require urgent solutions. Our scientific research attempts to provide current and substantive proposals, and to display scientific results. In the identification process, the goal is that those risk areas and risk scenarios that belong in the same main categories, model, as much as possible, the sequences of events that may have an impact on fundamental social values and interests.

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<sup>23</sup> Zsuzsanna GYENES, Magyarország nemzeti katasztrófa kockázat értékelése, [Hungary's National Disaster Risk Assessment,] (Budapest, 2011).

Altogether twelve risk areas can be specified. These do not only incorporate all low/serious probability events or accidents, but they include the risk areas in question and events/accidents with regards to the Hungarian conditions.

When selecting unexpected events and accidents for further analysis, the primary aspect is that every examined event has to have an effect on one or more of the social values. On the other hand, there are no social values that would not be affected by at least one of the scenarios.

The risk scenario is a unique detailed description of an unexpected event and accident, the description of a future state and of the acts and/or events resulting this. In relation to the preparation of scenarios, it is a general principle that they should be the realistic scenarios relating to the worst possible case; in other words, they should outline scenarios describing very serious, but well-established consequences. The scenario therefore introduces the probable, but, at the same time, the worst imaginable cases. The description of the scenario contains factual information in accordance with the following:

1. Context/individual contexts
2. The course/development of events, cases
3. Potential area of consequences (effects)
4. Description of potential knock-on effects to support the management of multiple risks (for the identification of the items of the scenario that can be triggered by the knock-on effect)

Figure 1. – Major aspects of scenario development,

Source: created by the authors.

During analysis, events triggering potential emergencies and the indicators measuring effects must be assigned to the criteria established for the risk effects.

Effect criteria	Potential risk events	Indicators measuring effects
<b>Death</b>	<b>chemical accident, dam burst, landslide, earthquake, terrorist act, epidemic, accident to nuclear power station, serious storms, morbidity and mortality in relation to heat waves, cold waves, forest fires, traffic accidents involving dangerous goods or materials, toxic materials, street violence, mining accidents, earth quake, nuclear accident, snow storm, flash floods caused by heavy rain falls, etc.</b>	<b>number, time of deaths (immediate: in one year; premature death: in 2-20 years)</b>

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<p><b>Injuries and sickness</b></p>	<p>chemical accident, large scale street violence, mining accident, earthquake, nuclear accident, injuries caused by snow storms, traffic accidents involving dangerous goods or materials, epidemics, serious storms, forest fires, etc.</p>	<p>number of people suffering from chronic diseases or seriously injured, incubation period in (1 year; in 2-20 years)</p>
<p><b>Lasting damage to nature and environment</b></p>	<ul style="list-style-type: none"> <li>• (eco)toxic materials, chemical accident, nuclear accident, contamination of rivers and lakes, climate change, larger accidents involving dams, earthquake, forest fires, soil erosion caused by lack of rainfall or heavy rainfall, reduction of forests and areas suitable for agriculture due to frequent or intensive droughts, oil contamination of rivers, natural waters and groundwater bases, accidents to mining/tailing dams, accidents to structures used for the storage of dangerous materials (e.g. hazardous waste storage facilities). etc.</li> </ul>	<p>areas affected, duration of damage caused</p>
<p><b>Financial and material losses</b></p>	<p>significant flow of refugees, epidemics resulting in sick-leaves of masses, the collapse of the financial market, dam burst, landslides, earthquakes, nuclear accidents, chemical accidents, costs of damages caused by flooding and serious storms, agricultural damages caused by droughts, the reduction of the economic value of forest areas, increased energy demand in the summer periods due to heat waves etc.</p>	<p>costs, material damage, health damage, financial loss, accident and repair costs, full economic loss</p>
<p><b>Social unrest</b></p>	<p>behavioral reactions of people induced by fear and/or anger; civil disturbance and vandalism, demonstrations; irrational financial transactions (mass cash withdrawals); moving away/changing residence; avoidance of public spaces (work places, nurseries, schools) and public transportation, etc.</p>	<p>number of people involved in the behavioral reaction and the duration of the phenomenon</p>

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<b>Disorders in everyday life</b>	<b>regular disruptions or lack of basic services: traffic, transportation, food, water, fuel, electricity, finance and economy, critical infrastructure. Regular disruptions or lack of secondary services: telecommunication, education, access to health care.</b>	<b>number of people concerned, duration</b>
<b>Weakening of nationwide governability</b>	<b>violating the democratic system, cyber attack (national institutions, financial institutions), terrorist acts, etc.</b>	<b>damages to the operation of public administration, damages to the operation of political governance, damages to the operation of the national financial system, damages to public order and public safety, damages to civil liberties and other rights (religious, freedom of speech, voting rights) etc.</b>
<b>Weakening of territorial administration</b>	<b>accident, the (partial or complete) inaccessibility of the country; tangible losses: the attack of an external power, the infringement of international treaties or laws that incorporates problems related to sovereignty and execution; operational damages: the destruction of buildings, flats, infrastructure, agricultural land, etc.</b>	<b>the geographical area affected, duration of damage</b>

Table 1. - Events triggering potential risks and indicators measuring effects,  
Source: created by the authors.

When determining the uncertainty we can assume that, in the light of the probability of occurrence, the uncertainty factor is the probability of the occurrence of the risk, and is not determined by the estimated vulnerability. This means that in order to determine the probability of a risk scenario, categories used as minimum threshold (A), maximum threshold (F) and the projected mean value (K) must be examined. The examination may show that the three probability values are in the same category.

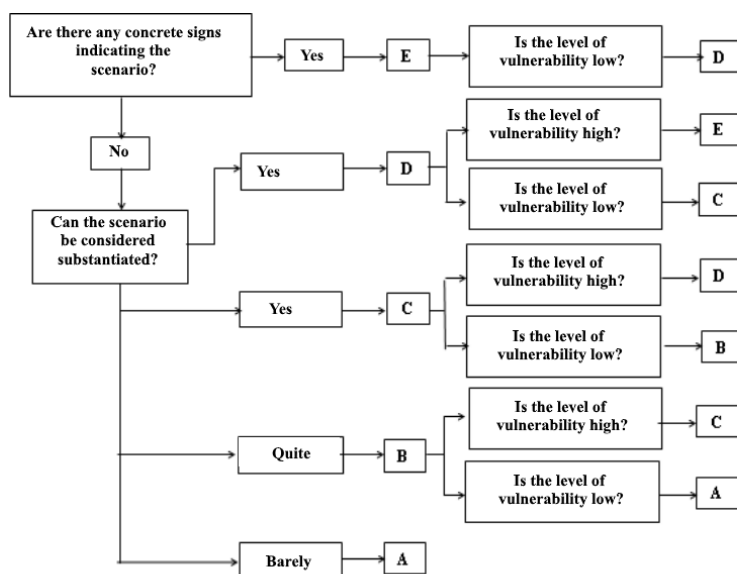


Figure 2. The procedure of determining probability (in case of intentional events)  
Source: created by the authors.

When determining the probabilities of risk scenarios we consider the following:

- a) as a first step, we must evaluate the availability of quantitative data: event data, data related to failure, probability plan data, statistical data on climate conditions; if data is available probability must be determined based on them;
- b) if necessary, default probability must be adjusted in accordance with the filtering/expanding of the cause or condition (correction factor number 1.);
- c) If necessary, probability must be adjusted in accordance with the extent of effect described (correction factor number 2.);



- d) if necessary, probability must be adjusted in accordance with the tendencies related to the altered conditions (correction factor number 3.);
- e) if adjustment is taking place due to the change of the level of risk management ability, there is a change in the vulnerability classification too (correction factor number 4.)

The determination of the occurrence probability of the risk scenario always involves at least two items:

- 1) the probability that the given risk event actually occurs;
- 2) the probability that the given risk event in fact induces the described effect.

<b>Risk areas</b>
<b>1. Extreme weather conditions</b>
<b>2. Damages to waters</b>
<b>3. Geographical risks</b>
<b>4. Epidemics</b>
<b>5. Space weather</b>
<b>6. Dangerous materials</b>
<b>7. Traffic accident</b>
<b>8. Nuclear accident</b>
<b>9. Terrorism</b>
<b>10. Cyber attack</b>
<b>11. Security policy crises</b>
<b>12. Crises of energy supply</b>

Figure 3. Risk areas of Hungary: Source: created by the authors.

For the identification and analysis of the twelve risk areas and the related scenarios. The twelve risk areas do not only incorporate all low probability/serious events or accidents, but they include the risk areas and events/accidents as determined based on the information passed on by the public institutions concerned.

We can further classify main risks to further specific risk subfactors. This way altogether 72 security risks can be determined, whose effects and probabilities we are able to determine.

Scenarios		Subscenarios
<b>1. EXTREME WEATHER</b>	<b>1.1 Serious storms</b>	<b>1. Violent winds of destructive effects</b>
		<b>2. Cloudbursts</b>
		<b>3. Snow storms</b>
		<b>4. Violent winds of destructive effects influenced by climate change C;</b>
		<b>5. Cloudbursts influenced by climate change C;</b>
		<b>6. Snow storms influenced by climate change C;</b>
	<b>1.2. Extreme temperatures</b>	<b>1. Heat waves</b>
		<b>2. Cold waves</b>
		<b>3. Heat waves influenced by climate change C;</b>
		<b>4. Cold waves influenced by climate change C;</b>
	<b>1.3. Droughts</b>	<b>1. Droughts</b>
		<b>2. Droughts influenced by climate change C;</b>
	<b>1.4. Forest fires</b>	<b>1. Forest fires</b>
		<b>2. Forest fires influenced by climate change C;</b>
<b>2. DAMAGES TO WATERS</b>	<b>2.1. Flash floods</b>	<b>1. 100-year floods</b>
		<b>2. 100-year floods influenced by climate change C;</b>
	<b>2.2. Floods</b>	<b>1. 100-year recurrence interval (Danube)</b>
		<b>2. 100-year recurrence interval influenced by climate change (Danube) C;</b>
		<b>3. 100-year recurrence interval (Tisza)</b>
		<b>4. 100-year recurrence interval influenced by climate change (Tisza) C;</b>
		<b>5. 500-year recurrence interval (Danube)</b>

		6. 500-year recurrence interval influenced by climate change (Danube) C;
		7. 500-year recurrence interval (Tisza)
		8. 500-year recurrence interval influenced by climate change (Tisza) C;
	2.3. Inland inundation	1. 20-year recurrence interval (Tisza)
		2. 20. 20-year recurrence interval (Tisza)
<b>3. GEOGRAPHICAL RISKS</b>	<b>3.1. Earthquakes</b>	1. Magnitude: 2.5-4
		2. Magnitude: 4-5
		3. Magnitude: 5-6
		4. Magnitude: Over 6
	<b>3.2. Surface displacement phenomena</b>	1. Collapses of high embankment
		2. Large-scale inclined mass movements
		3. Medium-size inclined mass movements
		4. Collapses of high embankments influenced by climate change C;
		5. Large-scale inclined mass movements influenced by climate change C;
		6. Medium-size inclined mass movements influenced by climate change C;
	<b>3.3. Collapse of cavities</b>	1. Collapse of cavities with serious consequences
		2. Collapse of cavities without serious consequences
		3. Collapse of cavities with serious consequences influenced by climate change C;
		4. Collapse of cavities without serious consequences

		influenced by climate change C;
	3.4. Other effects of unfavorable geographical conditions	1. Dam bursts of tailings reservoirs 2. Dam bursts of tailings reservoirs C;
4. EPIDEMICS	4.1. (Repeated) outbreaks of infectious diseases	1. (Repeated) outbreaks of infectious diseases 2. (Repeated) outbreaks of infectious diseases influenced by climate change C;
	4.2. Worldwide influenza pandemic	1. Worldwide influenza pandemic
	4.3. Animal and plant health	1. Animal and plant health
	4.4. Invasive allergenic or poisonous plants	1. Allergen 2. Poisonous 3. Allergen influenced by climate change C;
5. SPACE WEATHER	5.1. Geomagnetic storms	1. Magnitude: Weak - Intermediate 2. Magnitude: Strong
	5.2. X-ray radiation related to sun storms	1. X-ray radiation reaching Earth's atmosphere
	5.3. Very high-energy charged particles of cosmic radiation reaching Earth	1. Very high-energy electrically charged particles of cosmic rays reaching Earth
	5.4. Very high-energy charged particles of solar origin reaching Earth's atmosphere	1. Very high energy electrically charged particle burst of solar origin that reaches Earth's atmosphere
	5.5. Solar radio bursts	1. Natural radio bursts of solar origin (for example during coronal mass ejection)
6. HAZARDOUS MATERIALS	6.1. Flammable and explosive materials	1. Flammable and explosive materials released in large

	released in large quantities	quantities
		2. Flammable and explosive materials released in large quantities influenced by climate change, C
	6.2. Poisonous materials released in large quantities	1. Poisonous materials released in large quantities
		2. Poisonous materials released in large quantities influenced by climate change, C
	6.3. Environmental damage caused by poisonous materials released in large quantities	1. Environmental damage caused by poisonous materials released in large quantities
		2. Environmental damage caused by poisonous materials released in large quantities influenced by climate change, C
7. TRAFFIC ACCIDENTS	7.1. Serious traffic accidents (shipping, road, rail and air traffic)	1. Serious road traffic accidents
		2. Serious road traffic accidents
		3. Serious waterway traffic accidents or serious shipping accidents
		4. Serious air traffic accidents
		5. Serious road traffic accidents influenced by climate change C;
		6. Serious waterway traffic accidents or serious shipping accidents influenced by climate change C;
8. NUCLEAR ACCIDENTS	8.1. Nuclear accident	1. Nuclear accident

<b>9. TERRORISM</b>	<b>9.1. Act of terrorism (chemical, biological, radioactive, nuclear, explosive,)</b>	<b>1. Act of terrorism (chemical, biological, radioactive, nuclear, explosive,)</b>
<b>10. CYBER ATTACK</b>	<b>10.1. Cyber attack</b>	<b>1. Cyber attack</b>
<b>11. SECURITY POLICY CRISES</b>	<b>11.1. Security policy crises</b>	<b>Has been assessed indirectly</b>
	<b>11.2. Migration</b>	<b>1. Migration</b> <b>2. Migration influenced by climate change C;</b>
<b>12. CRISES OF ENERGY SUPPLY</b>	<b>12.1. Crises of energy supply</b>	<b>Has been assessed indirectly</b>

Table 2. The 72 security risks of Hungary,  
Source: created by the authors.

Based on the results of the analysis of the critical infrastructures affected in the risk scenarios the following important conclusions can be drawn: the following important conclusions can be drawn:

- More than 40 scenarios concern the transport sector and more than 30 scenarios deal with the energy as well as the public and national security sectors.
- The legal order and the public administration sectors were the less affected.
- When using the weighted average method the results show a somewhat different picture: while the transport and energy sectors can still be regarded as largely affected, public and national security as well as industry sectors seem to be less affected.

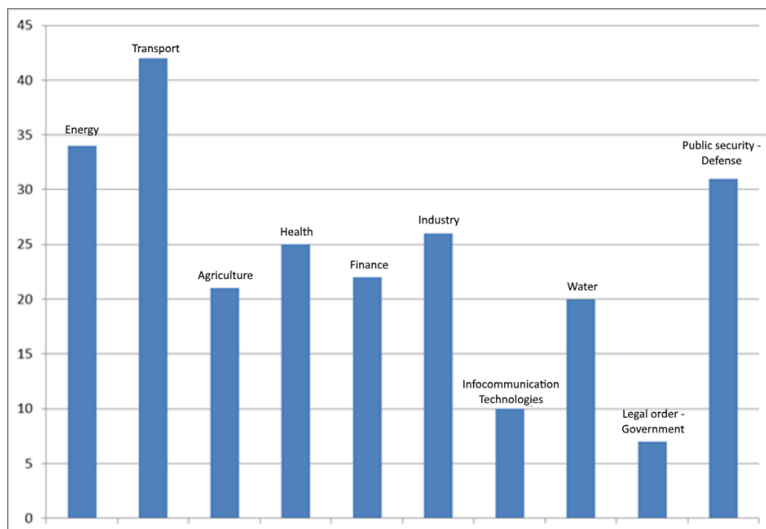


Figure 4.: Critical infrastructure sectors affected by the scenarios  
– Number of affected scenarios,  
Source: created by the authors.

Furthermore, it is also important to note that the result of the disaster risk assessment procedure provides only a basis for the identification of measures aiming at the management of serious risks. The various types of risks require the execution of measures of different nature and budgetary demands. The target oriented modification of the procedures and core activities of certain sectors is sufficient for the reduction of a risk level, while in case of other sectors the execution of exceptionally resource-intensive measures of detailed planning demand is necessary to achieve a similar risk level reduction.

The scenarios of significant risk levels are described in the next chapter. Risk areas that require the most significant resources for their management and that represent the most serious consequences compared to the others are as follows:

1. Extreme weather,
2. damages to waters,
3. influenza pandemic,
4. migration,
5. nuclear accident,
6. invasive allergenic or poisonous plants,
7. geomagnetic storms,
8. animal and plant health.

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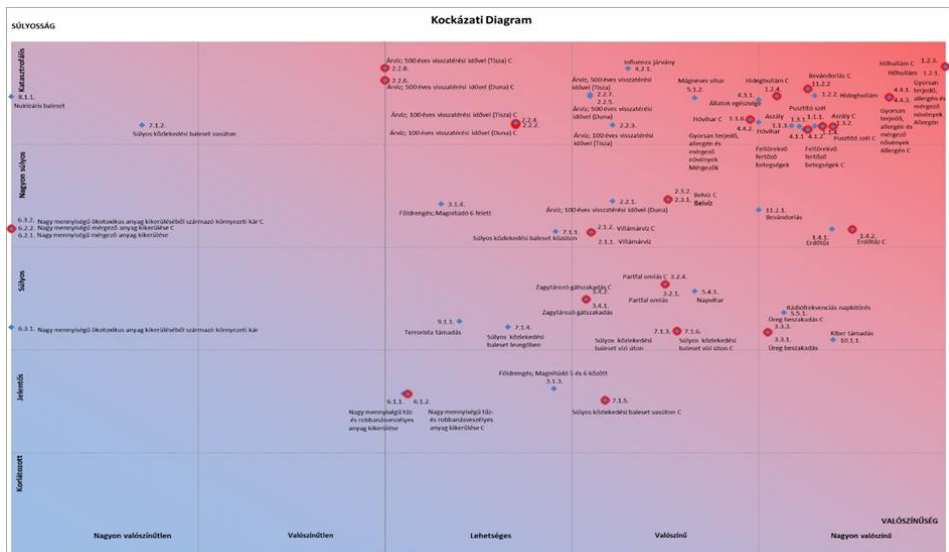


Figure 5.: Risk diagram of Hungary. Source: BM, OKF

## Summary

Security and national security risks depend on effect and probability. According to the classic definition of risks, the extent of a risk is determined by the sum of the risk effect and the extent of the probability of the occurrence (where both factors represent the same significance). The matrix diagram introduced by us displays the probability of the various scenario events in five years and their worst consequences as described by the scenario. The comparative ranking of the scenarios is displayed visually from the color blue to red. In this case, this does not mean that those scenarios that have a higher ranking from the point of view of risk effects and probability would have a higher priority. The graphic display of the risks is represented in the risk matrix diagram in relation to the two mentioned scales in order to provide a relative comparability.

The risk diagram also contains the scenarios that belong to the climate change effects (C scenarios, displayed with red circles). This way, the various scenarios occurring based on the present conditions and due to the effects of the climate change can be compared to each other. Apart from this, implicitly, the risk values also incorporate the effects on effects triggering multiple risks.

When examining the risk level of the failure of the system of public administration it can be established that the set of scenarios only represent security and national security risks. Further subcategories can be created of those catas-



trophe risks that pose a high risk to the public administration becoming inoperable, such as a serious flood or nuclear catastrophe. This scenario is characterized by (very) low probability and serious consequences, and, from the point of view of the risk to the public administration becoming inoperable, the risk is primarily represented by the effect.

When discussing the possibility of the reduction of the risk, the question is which scenario represents a relatively easily attainable gain: for example by the development of capabilities and resources that could significantly reduce the extent of the risk. These typically mean high probability risks. Apart from the risk, it also plays an important role in this case that by developing capabilities there is an opportunity to improve the risk profile.

It can be concluded that, presently, events representing security risks taking place in our micro- and macro-environments (for example extreme weather, migration crisis, etc.) the resulting catastrophe situations, hazard sources increasingly focus governmental attention to the questions and issues of national security, public and disaster management as well as of economic security and defense readiness. In our opinion, further results of scientific value could be attained by the comprehensive study, analysis of these fields as well as with the elaboration of concrete development proposals of practical value.

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