COUNTRY REPORT. CONDITIONALITY ROMANIA 2016. SELECTION

FRANCISC SENZACONI (coordinator)*

ABSTRACT

This report was developed in the project "National Risk Assessment – RO RISK" – (SIPOCA code: 30, co-financed under EFS through the Operational Programme for Administrative Capacity 2014 – 2020) under coordination of the General Inspectorate for Emergency Situations by a team of external experts (Agora Est Consulting). The data used in this report was provided by the institutions involved in the sectoral risk assessment (see *Annex no. 1*). In the elaboration of the report, the team of experts benefited from the assistance provided by advisors from the Joint Assistance to Support Projects in European Regions (JASPERS).

An overall national review of all the risks in Romania is one of the most important concerns of the Romanian central authorities involved in risk prevention, response and management. Very professional and well documented analysis of various hazards were developed over the past years, but a general common perspective on these hazards was never explored at national level. This approach may contribute to the increase of effectiveness of risk related emergency situations services, but also to a broader cooperation among different European states in facing the consequences of various hazards.

A national risk assessment in Romania is of special importance for the level of interoperability among different domestic institutions, but also abroad. Communicating the risks to population and an increased level of performance of responsible institutions are key factors in this context. The European Commission considered this topic as highly important and development of a risk assessment at national level became one of the conditionality for accessing European funds for 2014−2020.

The aim of this report was to present the main actions which were undertaken in order to comply with this conditionality and to develop a solid risk assessment process in Romania.

As the reader will further discover in this report, one of the key features of the national risk assessment process in Romania is the wide coverage of the consultation process which was undertaken in order to reach a general agreement on the way risks

* Report Coordinator, General Inspectorate for Emergency Situations (IGSU), e-mail: *senzacof@mai.gov.ro*.

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are assessed. Relevant central and local administration institutions, research institutes, as well as common citizens were involved in different stages of the consultation process.

Another feature is the involvement of specialized institutions in developing sectoral risk assessment. Using a common methodology, the risks were assessed and results were used in order to place the risks on a common matrix.

This report is the first one of a series of reports which will be periodically updated in order to insure a proper communication of risks to population and relevant institutions. The report contains the main activities that were undertaken in order to comply with the recommendations provisioned in the thematic ex-ante conditionalities for accessing European funds in 2014–2020, as proposed by the General Regulation 2014–2020. The objectives of these conditionalities are the following:

1. To promote climate change adaptation and risk prevention and management (Climate change target). This objective envisages promotion of investment addressed to specific risks, ensuring mobility for disasters and disaster management systems development.

2. Risk prevention and risk management. In order to comply with this objective, a national or regional risk assessments for disaster management has to be developed, taking into account the climate change adaptation objectives.

The report provides information about the manner in which these criteria have been met. It refers to results and activities developed, as well as the actors involved in the process. This document represents a starting point, as it shall undergo periodical revisions, and strategies and further policies shall be added in the future, as recommended by the European Decision No 1313/2013 on a Union Civil Protection Mechanism, article 6 (c) stating that "Member States shall: (c) *make available to the Commission the assessment of their risk management capability at national or appropriate sub-national level every three years following the finalization of the relevant guidelines as referred to in point (f) of Article 5(1) and whenever there are important changes*".

The main coordinator of the process of risk assessment in Romania and responsible for complying with the conditionality criteria is the General Inspectorate for Emergency Situation (GIES, in Romanian: *Inspectoratul General pentru Situații de Urgență – IGSU*). This institution is part of the Emergency Situation Department from the Ministry of Interior.

Keywords: national risk assessment, hazards, emergency situations.

1. INTRODUCTION

1.1. CURRENT SITUATION

In Romania, the risk management organizational system[1] comprises of a series of institutions from the central, the territorial (decentralized) and local public administration.

[1] Accordance with the legislative provisions: **Government Decision no. 762/2008** on the approval of National Strategy of prevention of emergency situations; **Government Decision no. 557/2016** on the approval of risk type management; **Emergency Ordinance no. 1/2014** on certain measures in the area of emergency management and amending and supplementing Government Emergency Ordinance no. 21/2004 on the National Management System for Emergency Situations.

The main piece of legislation regulating the emergency situations domain in Romania is the Government Emergency Ordinance (GEO) no. 21/2004 on the **National Management System for Emergency Situations**, amended and supplemented by the Government Emergency Ordinance no. 1/2014 on certain measures in the area of emergency situation management. In completion of the legal framework, the Government Decision (G.D.) no. 557/2016 on risk type management was adopted. According to these normative acts, the institutions have defined the obligation to draw up sectoral plans to provide specific emergency situations management. The coordination of the whole process is ensured by the National Committee for Special Emergency Situations (NCSES).

The National Emergency Situations Management System represents a permanent communication network, between public administration authorities and the organizations qualified for emergency management, established by levels and fields of competence, and which have the infrastructure and resources necessary for reducing casualties and response in case of different types of emergency situations.

The *National System* is composed of:

– Emergency situations committees (at national, ministerial, Bucharest Municipality, county and local level);

– The General Inspectorate for Emergency Situations (as integrator – ensures the transmission of the decisions taken by the Government or by the National Committee towards the local and central public administration authorities);

– Professional community public services for emergency situations (County Inspectorates for Emergency Situations) and Volunteer emergency services according with G.E.O. 21/2004;

– Operational centers for emergency situations (permanent or temporary – are established within ministries and other institutions within the system, in order to ensure the flow of information before or at the time of an emergency);

– On-site commander (ensures the unitary coordination at the place where the exceptional event has occurred);

– In order to manage emergency situations, GIES and the county structures fulfill the mission of: monitoring, evaluation and response to emergency situations;

– Information and preventive education of the population and warning of the population, notification to government authorities about the possibility/imminence of emergency situations; search and rescue, extrication of persons; evacuation of endangered people, population and property by ensuring evacuation measures, installing victim camps, participation in public transportation and certain categories of goods.

As an integrator of the National Emergency Situations Management System, GIES coordinates the actions of the institutions involved in the management of emergency situations, ensuring the position of national contact point in relationship with governmental and nongovernmental international organizations with responsibilities in this area.

From an operational point of view, GIES and the county structures have 42 operational centers and 280 operational sub-units, with over 3 500 pieces of equipment for intervention. The nearly 30 000 human resources/people represent 97% of the operational units and 3% are administrative structures: educational and research institutions, facilities, workshops and technical supply warehouses, logistics and repairs.

In this institutional framework, special attention has been given to the appropriate measures to respond to recommendations in order to fulfill the 5.1 ex-ante conditionality mentioned above. The approach involved the following steps:

– Establishing a National Risk Assessment Working Group (in Romanian „Grupul de Lucru pentru Evaluarea Riscurilor la Nivel Național" – GLERN). It was concerned with the national risk assessment, as well as to ensure the continuity of the estimation process and risk mapping. It is a working group consisting of experts on risk assessment from the Central Public Administration (ministries), the academia and research institutions. Also, it is a condition to fulfill the ex-ante conditionalities for accessing EU funds for the period of 2014–2020;

– The development of the individual risk (sectoral) assessment – The development and implementation of the Methodology – at this stage experts from the business sectors, authorities form central and local level, as well as experts from the academia and the ministries with attributions in the management of the types of risks that may generate emergency situations were involved;

– The development of the sectoral risk assessment – at this stage experts in the assessment of the ten types of sectoral risks, ministries with attributions in the management of the types of risks which may generate emergency situations, as well as authorities with attributions in the intervention as stated by the law were involved;

– The development of The National Platform for Disaster Risk Reduction (NPDRR, in Romanian PNRDD) was part of the implementation of the measures under the Hyogo Framework for Action and Sendai Framework. It is organized and operates as a national multi-sectoral and interdisciplinary mechanism, consisting of NCSES members, the technical and scientific support groups and NGO representatives, the associative structures of local authorities, professional associations, trade unions, higher education institutions and research institutes, cultural institutions of religious denominations and associations recognized by law and mass media.

1.2. TYPES OF RISKS ACKNOWLEDGED BY THE ROMANIAN LEGISLATION

According to the regulation in force, there are a number of hazards acknowledged by the Romanian legislation and considered, on historical basis, as being probable to occur on Romanian territory. A number of 10 types of hazards were selected from this list to be subject to assessment, based upon scientific

evaluations. The evaluations were based on historical data regarding the impact of each risk, as well as different assessments developed at the level of relevant institutions. On the left column, *Table no. 1* shows the initial hazards and, on the right column, the 10 types of hazards that were selected after evaluations.

Table no. 1

Selection of risks

Natural hazards	Storms and blizzards	Selection process	**1. Floods**
	Floods		
	Massive snowfalls		**2. Drought**
	Tornadoes		
	Drought		**3. Forest fires**
	Extreme temperatures		
	Forest fires		**4. Landslides**
	Avalanches		
	Landslides		**5. Earthquakes**
	Earthquakes		
Technological hazards	Accidents, breakdowns, explosions and fires in industry, including land collapses caused by mining activities or other technological activities		**6. Nuclear and radiological accidents**
	Accidents, breakdowns, explosions and fires associated with the transportation and storage of dangerous products		
	Accidents, breakdowns, explosions and fires in transportation activities		**7. Seveso accidents**
	Accidents, breakdowns, explosions, fires or other events associated with nuclear or radiological activities		
	Water pollution		**8. The risk of major accidents involving dangerous substances**
	Collapses of buildings, installations and facilities		
	Failure of public utilities		
	Falling objects from the atmosphere and from space		
	Inactivated or unexploded ordnance leftover from military conflicts		
Biological hazards	Epidemics		**9. Epidemics**
	Animal epidemics and Zoonosis		**10. Animal epidemics and Zoonosis**
	Radiological risk		

The selection of hazards as well as the entire process of risk assessment was developed taking in consideration the provisions of the Decision No. 1313/ 2013/EU of the European Parliament and of the Council, of 17 December 2013 on a Union Civil Protection Mechanism.

1.3. GIES VISION AND OBJECTIVES

The organization of emergency situations response activities has a long history in Romania. From the Roman organization of the municipal services, through the Middle Ages to the modern times, services provided in case of emergency situations were considered of major importance. This type of services starts to be reformed and equipped in the 19th century when fire fighters became an organized military corps of the Romanian Army, as subunits of territorial artillery.

In 1945, the Military Firefighters were transferred, together with their organization, to the Ministry of Interior. As a result, the Command of the Military Firefighters becomes the General Inspectorate of the Firefighters. Therefore, they were not part of the army staff, but were organized as a civil institution of the Ministry of Internal Affairs.

In 1968, as a result of a change in the legislation, fire companies were set in each county residence, 39 counties at the time. Subunits have been established on some industrial sites (after the sinister incident from Pitesti in 1974), the testing and experimentations center from Boldeşti (in 1974 as well), the School of Firefighters officers from Bucharest (1976), which became the Firefighters Faculty, as well as the school of NCOs Firefighters from Boldeşti (1986).

It is worth mentioning the fact that more recently, since 1984, firefighter officers had been trained successively in Bucharest, Oradea and Sibiu, while noncommissioned officers were trained in Bucharest (since 1931) and Câmpina. Important reform initiatives (allocation of modern equipment and training) were undertaken after the fire on the petrochemical platform from Pitesti in 1974 that had caused huge material damage and loss of human lives. The period is important in that the use of cars with gasoline engines had been almost entirely stopped. The import has been maximally lowered and high capacity special vehicles have been domestically produced, with multiple working possibilities, such as the ones with four-extinguishing agents. In the 80s, the equipment of the Military Firefighters was completely renewed.

In the post-communist period the emergency situation services went through major changes, as did the entire Romanian society. A major initiative came into force on 15 th December 2004, when the General Inspectorate of Military Firefighters, along with its units, merged with the structures composing the Civil Protection Command, thus generating the General Inspectorate for Emergency Situations, the county inspectorates and that of the Ilfov-Bucharest Municipality. This institutional change was motivated by the exponential growth of non-military risks, against the background of globalization trends, climate change, the diversification of the economic activities and response to disasters. The

inspectorate has been active until recently, when its profile was reformed in order to be compatible with the EU requirements.

In the pre- and post-accession period, Romania benefited from the support provided by EU through its funds. Among the projects developed by The General Inspectorate for Emergency Situations worth being mentioned are the following:

– Joint Risk Monitoring during Emergencies in the Danube Area Border, Cross Border Cooperation Programme Romania – Bulgaria 2007–2013;

– Improvement of the response of the Mobile Emergency Service for the Resuscitation and Extrication (SMURD) in emergency, preparedness and intervention through a joint integrated system for efficient monitoring and disaster consequences mitigation, according to population in the common boundaries of Romania, Ukraine and The Republic of Moldavia;

– EMERSYS – for an integrated border system for detection and written procedures for fast response in nuclear, radiological, biological, chemical emergency situations – MIS ETC 774. Cross Border Cooperation Programme Romania – Bulgaria 2007–2013.

Following the implementation of these projects and the institutional reform initiated in this very important area, the General Inspectorate for Emergency Situation continues to have a major role in the development of a sound national system in order to provide emergency services in a more efficient and accountable manner.

According to its latest strategic plan[2], the main objective of GIES refers to its institutional consolidation and development, in order to increase the operational and response capacity, reduce the impact of emergency situations on communities and improving the quality of missions undertaken in benefit of the population. The reason for introducing GIES vision and objectives as a distinctive chapter in this country report is represented by its central position in the National Emergency Situations Management System in Romania. However, the action roadmap presented in a later chapter comprise initiatives envisaged also by other central public administration institutions.

Towards achieving its goals, GIES undertakes various activities correlated with different types of risks, active on Romanian territory. The actions are fire prevention and intervention, extrication and first aid (SMURD), search and rescue missions and limiting the damage caused by floods, landslides, seismic activity, epidemics, epizootic diseases, snow, drought, the assistance of people in critical situations, interventions in case of technological, radiological or biological accidents, or other types of natural and anthropogenic calamities.

The quantitative and qualitative indicators related to the corresponding activities for fulfilling the directions of action, are detailed in the Strategy Action Plan.

[2] http://www.igsu.ro/documente/informare_publica/Programe-strategii/PSI_2014 2016anexa_ OMAI_159din2014.pdf

1.4. THE PROCESS OF RISK ASSESSMENT IN ROMANIA

The main results of the process of risk assessment in Romania are represented by the Methodology for National Risk Assessment and, based on this methodology, individual assessments of sectoral risks[3].Identification of the position on the risk matrix of the risks identified represents the final outcome corresponding to these results. This report contains descriptions of the activities developed in order to obtain these main results.

These activities, summarized in the following pages, were of two types: *research* activities, represented by various studies and analyses and *consultation* activities with various stakeholders involved in risk management and assessment.

1.4.1. Methodology

The support activities for developing the Methodology[4] (**research** and **consultation** activities) were undertaken during the entire process of elaboration of its first draft, according with the provisions of the *Commission Staff Working Paper – Risk Assessment and Mapping Guidelines for Disaster Management*.

The *Research* activities consisted in conducting sociological research, comparative studies and legislation analysis aiming at gathering data on the existing situation regarding the institutional framework and possible means of improving it, identification of various thresholds for impact indicators, identification of methodological similarities for various already existing regulations and methodologies in force for different types of risks.

During the *Consultation* activities[5] various instruments were used, such as:

– Surveys: among citizens and representatives of various institutions regarding risk acceptability – thresholds of impact indicators for various risks;

– Interviews with relevant representatives of the institutions involved in risk assessment and management – identification of the best approach in the development of various components of the methodology;

– Workshops – the first draft of the methodology was subject to discussions during several workshops organized in order to reach a relative consensus among specialists regarding the thresholds and main components of the methodology. The main topics of the discussions were the following: the description of scenario

[3] As required by the Risk prevention and management criteria (p. 77).

[4] The methodology can be consulted at the following web address http://www.igsu.ro/documente/RO-RISK/Metodologia%20de%20evaluare%20unitara%20a%20riscurilor%20-%20prima%20versiune%20_draft.pdf

[5] Following the criteria for fulfilment which states that "the process of producing a national or regional risk assessment has involved a wide range of actors and stakeholders" (e.g. one coordinating authority has been designated; working groups involving public authorities from different levels, research and business, non-governmental organisations have been planned).

development and selection, the description of the main types of impact with corresponding thresholds, the technical solution for the calculation of possible impact, cross border issues, techniques for calculation of the global impact and a proposal for presentation of a common matrix with all types of risks in Romania, based on values of their estimated impact and likelihood. The participants to the workshops were mainly from specialized departments in ministries and governmental agencies;

– Input from the partner institutions of GIES involved in the development of sectoral risk assessments (assessments developed for each type of risk consisting in the description and analysis of risk scenarios) – a final set of recommendations were formulated after the dissemination of the first draft of the methodology, towards those institutions which were later involved in the application of the assessment of each type of risk.

During the entire process, as it is presented in *Figure no. 1*, two versions (one intermediary-first draft and one final) of the Methodology were developed. The sectoral risk assessments were developed using the provisions of the final version (draft II) of the methodology.

1.4.2. Risk Assessment

After reaching agreement on the content of the methodology, specialized institutions (see *Annex no. 1*) started developing individual assessments for each type of risk (sectoral risk assessments), based on the provisions of the methodology. During this phase, an in-depth analysis of each risk was developed, using relevant scenarios and the values of specific impact indicators, such as those referring to physical impact (human impact included), economic and socio-psychological impact, but also the likelihood scale and the selection criteria for scenarios.

Detailed economic and sociological methodologies were developed in order to support the sectoral risk assessments. During this phase, the content of the Methodology was once more submitted to a consultation process, a number of modifications being operated, in accordance with the recommendations of the institutions involved in the sectoral risk assessment[6]. Being as detailed as it was, the consultation process made possible the elimination of inconsistencies or possible causes of failure in its application on different types of risks. Another result of this process was the identification of some of its elements as being inconsistent or impossible to apply. In these cases, proper modifications of the initial version were undertaken.

[6] As required by the criteria for fulfilment stating that "Stakeholders and interested parties have been widely consulted on the draft risk assessments and information has been disseminated towards the general public on the process and the outcomes of risk assessment".

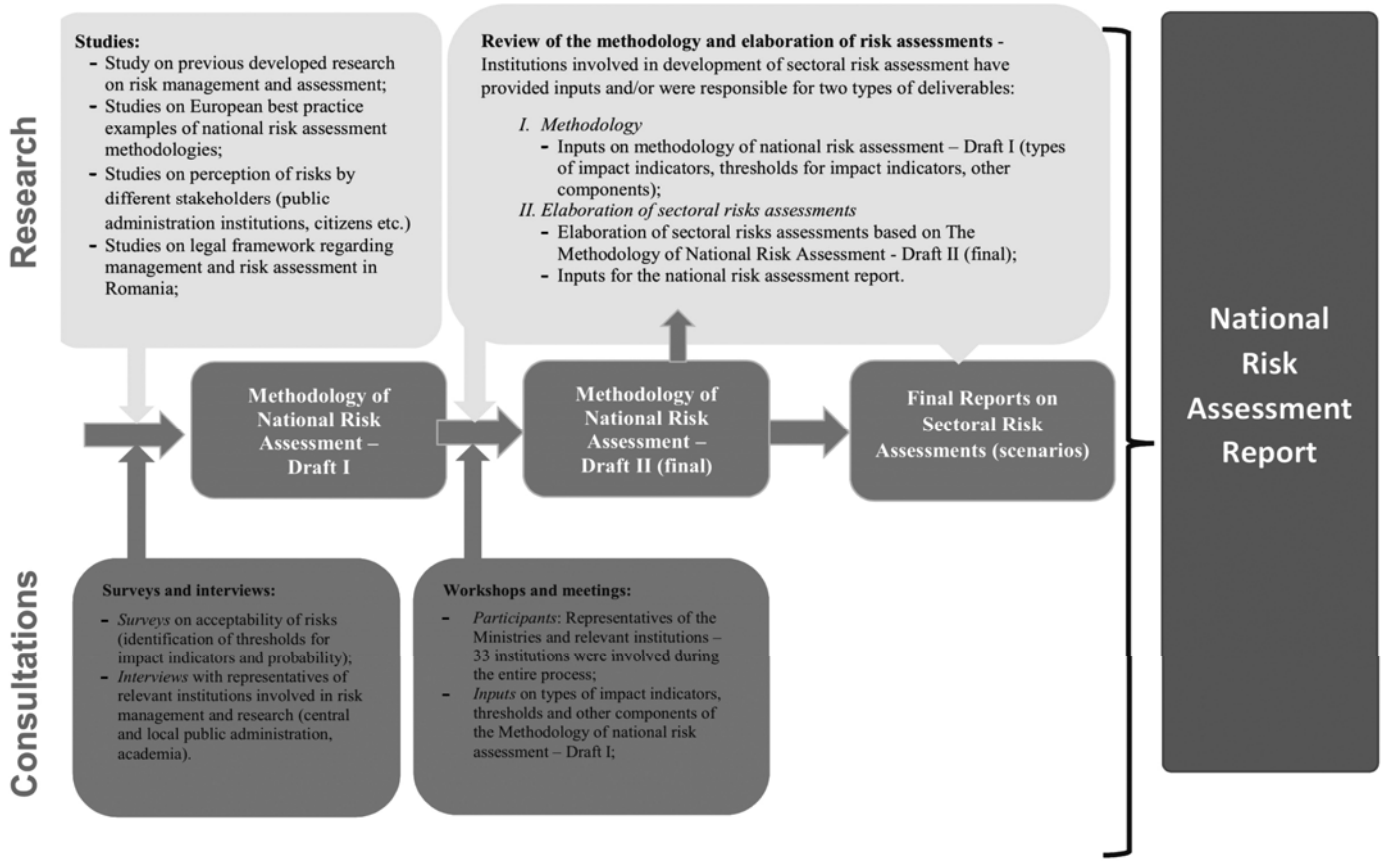


Figure no. 1 – The support activities for developing the methodology and sectoral risk assessment.

2. RISK ASSESSMENT INSTRUMENTS AND RESULTS

This chapter addresses two main aspects – a description of the main components of the methodology and the results of the sectoral risk assessments and the risk matrix.

2.1. MAIN COMPONENTS OF THE METHODOLOGY

The risk assessment process, its instruments and results have been developed according to the guidelines[7] and the Commission Staff Working Paper on "Risk assessment and Mapping Guidelines for Disaster Management" from 21st December 2010[8]. It also took into account the national climate change adaptation strategies, which address the impact of climate change[9] on health, agriculture and forest, biodiversity and ecosystems, water, costal and marine areas, and infrastructure and constructions. The main elements of the methodology were:

A. Scenario building

Scenario development (single and multi-risk scenario)

Single risk scenarios

Scenarios are a way of creating a descriptive base of analysis for future decisions regarding risk management. A scenario "provides a means of communication about a common image regarding future uncertainties and factors which may influence decisions to be taken in the present"[10].

The single risk scenarios represent scenarios that identify and describe a single risk and the implications that could be generated by a risk event. It was the primary concern of risk assessment, in order to obtain high consistency for the means and response level. Baseline analysis was the starting point in identifying and building scenarios. These elements were important because they enable, during the scenarios building process, differentiation between:

– Scenarios that were based on historical events that had a major likelihood to occur (floods, dangerous transportation accidents, etc.);

– Scenarios which may include indirect risks and longer-term development (global warming).

[7] Fulfilling the criteria stating that "A description of single-risk and multi-risk scenarios".

[8] Risk Assessment and Mapping Guidelines for Disaster Management SEC (2010) 1626 final. http://ec.europa.eu/echo/files/about/COMM_PDF_SEC_2010_1626_F_staff_working_document_en.pdf.

[9] http://www.mmediu.ro/beta/wp-content/uploads/2012/10/2012-10-05-Strategia_NR-SC.pdf.

[10] 2009, National Safety and Security Strategy of the Netherlands, *Working with scenarios, risk assessment and capabilities*, p. 17.

Experts from various fields were involved in order to identify different scenarios. In addition to sectoral risk experts (experts in physics, epidemiologists, etc.), experts with other specializations were involved (experts in public administration, construction, agriculture, sociologists, economists, etc.). The team's multidisciplinary nature enabled the identification and informational scenario building in a more accurate manner.

The methodology presented a series of features that should be followed in this first stage, which aimed at the identification of an extensive number of possible risk scenarios (approximately 40 for each type of risk).

All scenarios were identified based on the hazard's *likelihood*. Subsequently, the scenario's *impact* was checked, in order to establish whether it is affecting Romania's national or sectoral strategic interests. These two elements further enable *the selection* of a number of plausible scenarios (5 for each type of risk).

A general checklist was pursued during the scenarios building phase, according to the criteria mentioned in the Commission Staff Working Paper on "Risk Assessment and Mapping Guidelines for Disaster Management".

Multi-risk scenarios

Multi-risk scenarios refer to the occurrence of several different risk events, but interconnected, such as NaTECH events (Natural Hazard Triggering Technological Disasters), or events generating a domino effect. These represented the object of a multi–risk assessment for situations where an event triggers multiple events with different risks (e.g., an earthquake followed by several fires).

A multi-risk assessment consists in determining the events overall risk which:

– Occur at the same time;

– Follow each other, being initiated by the same trigger or hazard;

– Do not follow chronologically, but the events' occurrence influences the same exposed/vulnerable elements[11].

Multi-risk scenarios have been classified, therefore, in any of the aforesaid three types of events. Events that may occur in a multi-risk scenario belong to several types of hazards. In the scenarios identification and description stage, possible events amplifications determined by the interaction of several types of hazards have been considered. The vulnerability was addressed taking into account the possibility that all the events may occur.

The development of multi-risk scenarios in the process of risk assessment was recommended by the European Commission, particularly to Member States where the national risk assessment is in a later stage. The following steps were recommended:

1. Identification of possible multi-hazards scenarios, starting from a first – event and assessing the trigger for other possible hazards or events leading to hazards.

[11] Risk Assessment and Mapping Guidelines for Disaster Management SEC (2010) 1626 final.

2. Exposure and vulnerability analysis for each hazards and risk separately in each part of the scenario.

3. The estimated risks for each hazards, adverse event and multi-risk scenario.

Multi – risk scenario development and assessment represented a complex process in practice, which is why this Methodology for National Risk Assessment recommended that multi – risk scenarios should be identified, as a first stage, following the steps which were further detailed, and that the multi-risk scenarios assessment, which was a complex synthesis process, should be performed in a later stage of the national risk assessment.

B. Types of impact

The types of impact were specifically defined by the Impact of the Criteria (C) (see *Annex no. 4*). The Impact of the Criteria were assessed and measured through the representative indicators. The scores of these indicators allowed a quantitative – value assessment of these criteria and the calculation of the impact for each scenario[12]. All these indicators were measured through quantitative scales.

For some scenarios corresponding to certain types of risks it was not necessary to estimate the indicators corresponding to each criterion (e.g. the criterion "number of affected buildings" was not estimated in case of the scenario corresponding to the drought risk). In these cases, only the indicators that, according to the analysis conducted, were found to have been affected, have been taken into consideration.

In order to calculate the impact for all the criteria, the scale for the Impact of the Criteria (C) had 5 intervals, from *very high impact* to *very small impact* and is common to all the indicators. The scale included a series of indicators which were selected and defined as a result of the consultations with experts and public authorities, taking into account the European Commission recommendations, the methodologies of the Member States and the commonly accepted thresholds as representative of the impact.

T1. Physical impact

This type of impact referred to the physical, negative effects of a risk event of the exposed elements. The analysis of the impact of the criteria was performed for each of the selected scenario for each type of risk. The focus of this type of impact is represented by people, 4 out of 10 criteria referring to them. The indicators composing this type of impact were: the number of deceased people, injured people, evacuated people, people with no access to basic services. The rest of them are represented by civil and industrial constructions affected and destroyed,

[12] The mentioned types of indicators are part of the European Commission recommendations and are found in various forms and names in most of the methodologies developed by the Member States. This was done according to the criteria of fulfilment stating that the risk assessment has considered all three categories of impacts (human, economic and environmental, and political and social impacts).

kilometers of affected transport infrastructure, kilometers of affected utilities infrastructure, number of machinery and equipment, sq. km of affected area and environment – the protected area affected.

T2. Economic impact

The economic impact referred to the costs associated with human loss, the costs associated with direct material loss, costs associated with environmental loss, costs for the intervention of the task forces and indirect costs.

T3. Social and psychological impact

The analysis for the social and psychological impact generated due to the occurrence of a risk event was a substantial element of the impact analysis. It had a key role in the selection of the most important national risk scenarios. It consisted of disruptions of everyday life and the psychological impact.

C. Likelihood

The likelihood calculation resulted in the identification of the likelihood of a risk event to occur within a predetermined timeframe, taking into account the available information.

The information included in the scenarios constructed in the previous step was used to frame their likelihood on the proposed scale below. The likelihood of an event described by the relevant scenarios prioritized has been based primarily on data identified during construction of the scenario, and then, if the data was not available, on the expertise of specialists who have identified usable and comparable data.

The likelihood of the events described in the scenario was measured on a scale of 1 to 5 steps (1 – low, 5 – high).

D. Risk matrix

The risk matrix was the recommended tool for *representing, comparing* and, subsequently, *ranking* the scenarios. The matrix is a graphical representation of the aggregated impact and likelihood scores. The European Commission recommended this tool to ensure comparing results of the risk assessment in the Member States.

According to the matrix, the impact was placed on a vertical axis and the likelihood on a horizontal axis. The aggregate impact scores, the likelihood of a particular scenario and the manner in which the scores determine a scenario's position in the matrix were represented in the risk matrix.

Positioning the scenarios on the risk matrix has ranked a risk depending on risks value by placing them on the three areas of the matrix: acceptable – "green", necessary measures need to be implemented – "yellow", not acceptable – "red". Representation of the scenarios on the risk matrix provided a final list of the national main risks, according to their occurrence likelihood and their impact.

2.2. RESULTS OF SECTORAL RISK ASSESSMENTS BASED ON THE METHODOLOGY

Risk management represents the systematic approach and practice of managing uncertainty to minimize potential harm and loss[13]. It encompasses risk assessment and analysis, and the implementation of strategies and specific actions to control, *reduce* and transfer risks.

However, prevention is the outright avoidance of adverse impacts of hazards and related disasters[14]. Prevention (i.e. disaster or risk prevention) expresses the concept and intention to completely avoid potential adverse impacts through action taken in advance. Very often the complete avoidance of losses is not feasible and the task becomes one of mitigation. Partly for this reason, the terms prevention and mitigation are sometimes used interchangeably in casual use.

As one can see, risk prevention or mitigation is a part of a wider process of risk management. The following descriptions of types of hazards and their risk assessments are aimed at providing valuable information not only for risk response activities but for risk prevention as well. However, the results of the assessments are further used in this report for identification of possible capacity needs in order to increase the overall performance of emergency services provision.

For each type of hazard the description followed aspects such as: specific context (details on the specific physical context of disaster occurrence in Romania), estimated impact based on risk assessment developed according with the provision of the Methodology, likelihood/frequency in accordance with available historical data and comments on the position of the risk on the risk matrix. This information constitutes one of the sources for identification of objectives in organizing the emergency situations services related activities.

We will present below one exemplification for each category of risks.

2.2.1. Natural risks. Exemplification

Earthquakes

Specific context

Romania is situated at the contact of three continental tectonic plates: Eastern European plate (its Southwestern corner, with the Western boundary beneath the Eastern Carpathians) in the North-Eastern Romania, the Intra-Alpine sub-plate (a component of the Western European plate) beneath Transylvania, and the Moesian sub-plate in southern Romania.

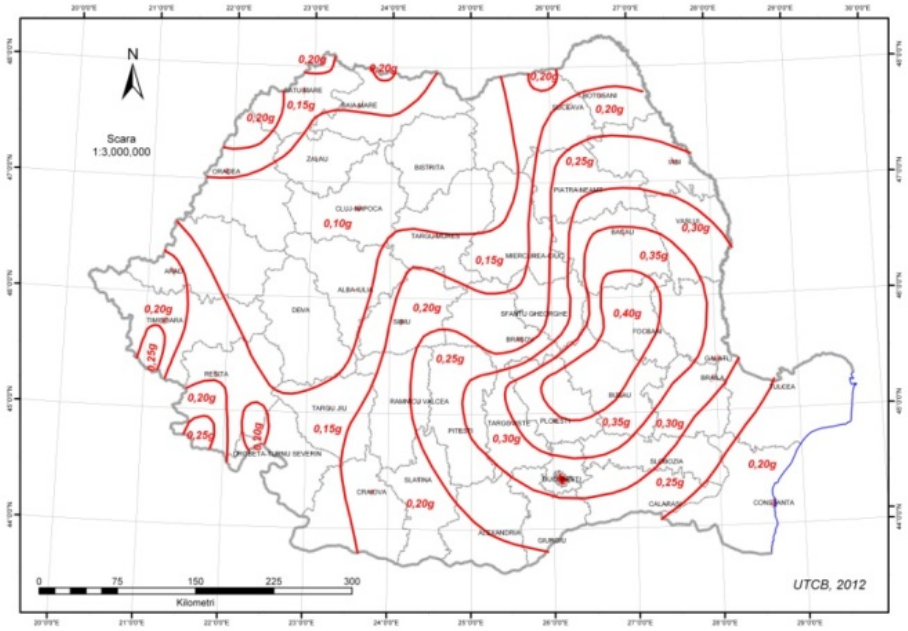
Several tectonic models, covering a large range of geodynamic scenarios, attempted to explain the characteristics of the strong intermediate-depth seismicity from the bend of the South-eastern Carpathians (Vrancea region); nevertheless, the nature and mechanisms for earthquake generation are still subjects of debate.

[13] Source: https://www.unisdr.org/we/inform/terminology#letter-r.
[14] Source: https://www.unisdr.org/we/inform/terminology#letter-p.

Likelihood and impact

The Romanian level of seismicity is determined by several sources: Vrancea area and other 13 seismic sources situatedon Romanian teritory but also on Bugaria's and Serbia's and Hungary's territories.

From these 14 sources, the Vrancea area is the most active one, influencing two thirds of the Romanian territory, but also parts of Moldova and Bulgaria. During the last century this sources determined seismic events with over 6 degree magnitude. 5 events were with a above 6,5 magnitude[15].



Map no. 1 – The design ground acceleration with mean recurrence interval, *MRI* = 225 years (20% likelihood of exceedance in 50 years) Official Gazette of Romania no. 558bis/2013. P 100-1/2013

In this area, situated at the Carpathians Arc-Bend, 2 separate/decoupled seismogenic zones are identified: the zone crustal seismicity (VRC), with earthquakes mainly down to 40 km depth, and the zone of intermediate-depth seismicity (VRI), in the depth range 60 to about 200 km, where major earthquakes with moment magnitude $M_w > 7$ may occur. The intermediate-depth earthquakes are felt over wide areas in Europe. The occurrence rate of the Vrancea intermediate depth earthquakes with magnitude greater than 5 is about 1,82 earthquakes/year. The maximum magnitude instrumentally determined for VRI is $M_w = 7,7$ – the earthquake of 10th November

[15] The most severe earthquakes occurred in Romania at 10 November 1940 (M_W=7,7, h=150 km), 4 March 1977 (M_W=7,4, h=94 km), 6 October 1908 (M_W=7,1, h=125 km), 30 August 1986 (M_W=7,1, h=131 km) and 30 May 1990 (M_W=6,9, h=91 km) – see also *Table no. 2.*

1940 In the Vrancea crustal zone (VRC), the most recently recorded significant event occurred on 22nd November 2016 with 5,2 magnitude. The presence of the Vrancea intermediate-depth seismic source results in a high seismic hazard in the Extra-Carpathian area of Romania, while the Intra-Carpathian zone (the central, North western and Western regions of the country) is less exposed.

75% of the population and 45% of the vital networks are exposed to moderate and high earthquake risk, and the possibility and likelihood of occurrence of a major earthquake in 30-40 years is a statistical reality. Romania's capital, Bucharest, is highly exposed to earthquakes. As seen in *Map no. 1*, the entire eastern part, some areas in the center, the southern and south-western parts of Romania are exposed to a high level of seismic hazard.

In the *Table no. 2*, an overview of the most important earthquakes is presented. Data on their impact, casualties and degree are provided.

Table no. 2

Major earthquakes on Romanian territory in the XXth century

	Date	**Time**	**M_w**	**Casualties**	**Building affected, economical losses**
1	November 10th 1940	03:39	7,7	593 deaths (140 in Bucharest) 1,271 injured (300 in Bucharest)	Low rise buildings seriously damaged The tallest reinforced concrete building in Bucharest collapsed.
2	March 4th 1977	21:21	7,4	1578 deaths (1,424 in Bucharest) 11,321 injured (7,598 in Bucharest)	– 156,000 apartments in urban zones and 21,500 rural houses destroyed or very seriously damaged – 366,000 apartments in urban zones and 117,000 rural houses to be repaired – destroyed 374 kindergartens, nurseries, primary and secondary schools and badly damaged 1,992 others – destroyed six university buildings and damaged 60 others – destroyed 11 hospitals and damaged 228 others hospitals and 220 polyclinics (health care centers) – destroyed or damaged almost 400 cultural institutions such as theatres and museums – damaged 763 factories US$ 2.048 billion equivalent loss
3	August 30th 1986	23:28	7,1	8 deaths 317 injured	
4	May 30th 1990	12:40	6,9	9 deaths 296 injured	
5	July 12th 1991	12:42	5,6	2 deaths 30 injured	5,000 rural houses in Banloc, hundreds to thousands of homeless in Timis County

According to the scenarios analysed, the impact of a major earthquake will be significant because of the urban areas situated close to the epicentre. Public perception reveals a high level of anxiety regarding the occurrence of an earthquake, especially in Bucharest, were the last major earthquake has caused many casualties and damage. The main concern is related to the situation of building vulnerability.

Position on the risk matrix

The Vrancea earthquake scenario is characterised by a moment magnitude MW = 8.1 (which corresponds to a mean return interval of 1000 years) and a focal depth of 90 km. The epicentre is situated in the area in which large magnitude Vrancea seismic events have occurred in the last century, in November 1940 and March 1977. Considering the widespread impact of this earthquake scenario, it can be considered as an event affecting the entire territory of Romania (although not in a direct manner).

The position of earthquakes on the risk matrix (*Figure no. 2*) indicates a high level of impact (4) in case of occurrence (the scenarios were developed for earthquakes of high intensity), but a rather moderate to low likelihood (2). Given the level of impact, preparation for a major earthquake should be considered as a high priority.

According to the assessment developed, 75% of the population and 45% of the vital networks are exposed to the risk of an earthquake, and the likelihood of a major earthquake to occur in 30-40 years is a statistical reality. One of the main concerns is that Romania's capital, Bucharest, is highly exposed to earthquakes. Moreover, the entire eastern part, some areas in the center, and the southern part of Romania are close to the epicenter.

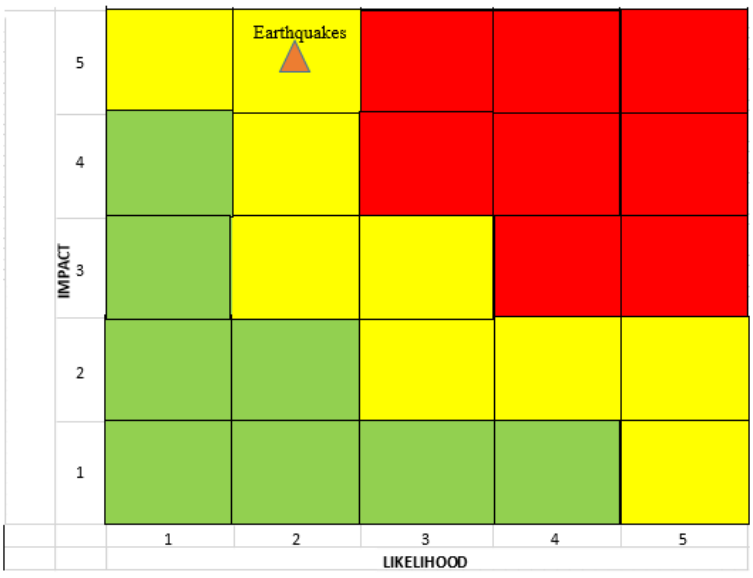


Figure no. 2 – The position of earthquake on the risk matrix.

Furthermore, the scenarios analyzed showed that the impact of a major earthquake will be significant because of the urban areas situated close to the epicenter. Public perception reveals a high level of anxiety regarding the occurrence of such an event, especially in Bucharest, where the last major earthquake has caused many casualties and damage. Moreover, earthquakes of lower magnitude have occurred in the Vrancea area in recent years, being felt in Bucharest, as well as other cities around the epicenter.

2.2.2. Technological risks. Exemplification

The risk of major transportation accidents involving dangerous goods

Specific context

The transportation of dangerous goods is done in accordance with national and international legislation linked to the Directive 2008/68/EC of the European Parliament and of the Council on the Inland Transport of Dangerous Goods.

The transport of dangerous goods/wastes involves several stakeholders, such as shippers, transporters, manufacturers, beneficiaries, state and emergency response institutions, each with a specific role in the transport of dangerous goods safely, from their origins to their destinations.

Dangerous goods include:

– industrial chemicals (chemical substances and mixtures, gases, acids, bases, etc.);
– agricultural use related chemicals (pesticides, fertilizers);
– combustible materials (fuels, liquefied petroleum products, etc.);
– household products (paints, adhesives, batteries, cleaning solutions, etc.);
– hazardous wastes resulting from fabrication processes or from consumption.

The main categories of high consequence dangerous goods are: explosives, flammable and/or toxic gases, flammable liquids, oxidizing liquids, toxic substances, corrosive substances. Dangerous goods represent a large percentage of total freight transport because they include many substances and products widely used.

Gasoline and other petroleum products are estimated at about 40% of all transfers of dangerous goods and about three quarters of the tonnage carried in Romania. Excluding traffic by pipeline and ships more than two thirds of the tonnage of oil is shipped by truck, especially on short haul routes of distribution.

Likelihood and impact

The transport of dangerous goods poses a risk because of the danger associated with accidental release of these materials. An incident involving a vehicle carrying dangerous goods may cause short and/or long-term consequences on human health and the environment, including severe illness, death, irreversible pollution, and the evacuation of people from the affected area.

Major transportation accidents can occur with a relatively low likelihood, but with potential severe consequences on population and/or environment in the surroundings. Certain routes have shorter lengths, but crossing areas with high population density; some routes avoid densely populated areas, but are longer, resulting in higher transport costs and accident possibilities; while other routes involve the use of highways as to minimize the travel time, but may be associated with higher rates of accidents.

According to existing national statistics most accidents occur on highways and in cities, where traffic is more crowded. Also, it can be seen in *Tables no. 3* and *no. 4* that most accidents involve flammable liquids and gases, which are the most shipped types of cargo.

Table no. 3

Accidents involving transportation of dangerous goods by road – type of substance transported
Source: GIES

The type of substance transported	No. of accidents	Deaths	Severely injured	Minor injuries
Flammable liquids	48	23	35	18
Gases	21	12	18	9
Oxidizing substances	11	8	8	4
Substances which generate flammable gases on contact with water	6	2	4	1
Organic peroxides	2	2	2	1
Flammable solids	2	3	1	1
Explosive substances	2	1	1	4
Substances subject to spontaneous ignition	2	1	1	0
Toxic substances	2	1	2	1
Auto-reactive substance	1	0	1	0
Corrosive substances	1	1	0	0
Total	**98**	**54**	**73**	**39**

Table no. 4

Accidents involving transportation of dangerous goods by road – place of occurrence.
Source: GIES

Occurrence place	No. of accidents	Deaths	Severely injured	Minor injuries
National road	52	37	39	31
Streets	34	10	26	7
County road	9	5	5	1
Other roads	2	2	2	0
Communal road	1	0	1	0
Total	**98**	**54**	**73**	**39**

Even if the frequency of dangerous waste transportation is relatively high, due to the fact that most of the wastes are mixtures of non-dangerous and dangerous substances and the quantities transported are small, the potential impact in case of a transportation accident is very low.

The transportation routes analyzed and the maximum possible hazard areas are represented in *Map no. 2*. The most important transportation hazards are:

– toxic dispersions involving ammonia, chlorine, sulphur dioxide, etc.

– explosions involving ammonium nitrate, flammable vapors/gases, explosive materials, etc.

– fires involving combustible liquids, such as petroleum products, flammable vapors/gases, etc.

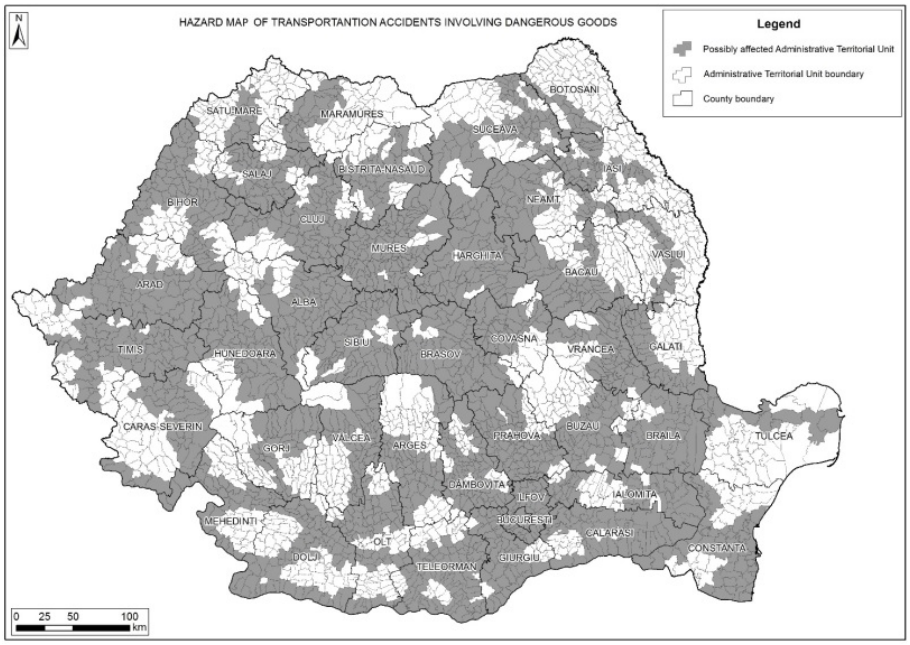
– BLEVE (Boiling Liquid Exploding Vapour Explosion) involving liquefied gases such as LPG, propylene, etc.

The dangerous goods transportation routes and related possibly affected ATUs are represented in *Map no. 2*.

Relevant transportation accidents involving dangerous goods in Romania:

In 1979 in a drugs factory in Bucharest a railway tank wagon containing liquefied ammonia and overloaded with 5 tons has exploded. 27 casualties and 175 severe intoxicated persons were registered and an area of 1.5 km^2 was contaminated.

In 2004 on the European Road E85, at the entrance in Mihailesti village, Buzau county, a truck transporting 20 tons of ammonium nitrate in bags skidded off the road, overturned in the ditch and slipped several meters. The cabin of the truck caught fire in a few minutes after the impact and after one hour the entire quantity of ammonium nitrate exploded. The consequences of the accidents were catastrophic: 18 deaths, 11 injured, 16 houses damaged, 6 private cars and 2 fire-fighter trucks.



Map no. 2 – Hazard map of transportation accidents involving dangerous goods – Possible affected TAUs.
Source: Babes-Bolyai University

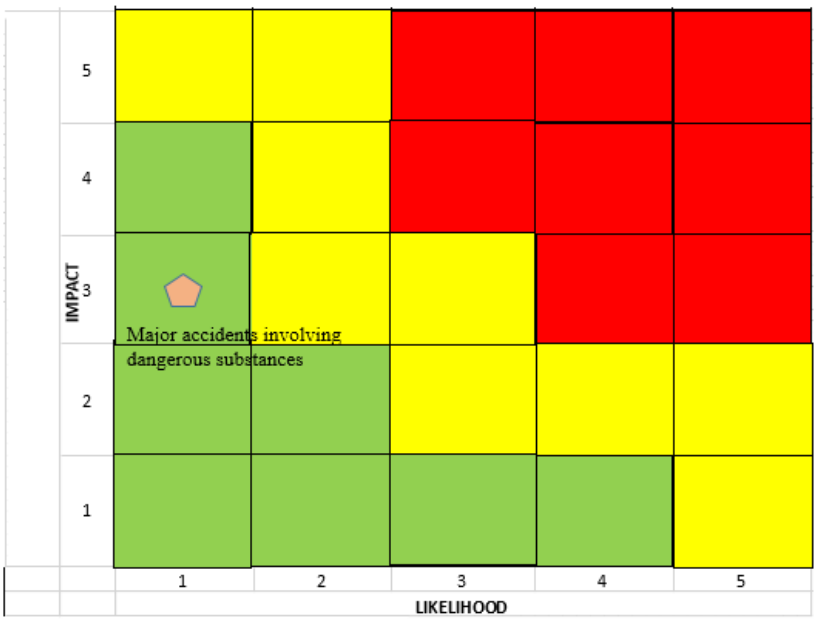


Figure no. 3 – The position of major transportation accidents involving dangerous goods on the risk matrix.

Position on the risk matrix

Based on the historical data and research on the possible impact, the risk of major transportation accident scenarios involving dangerous goods could be placed on the risk matrix on a position in the "green" area, with a low likelihood (1 – on the likelihood axis) (with frequencies lower than 4×10^{-3} events/year) and medium impact (3 – on the impact axis) (*Figure no. 3*).

The position of the selected transportation accident scenario involving dangerous substance is represented in the following risk matrix.

2.2.3. Biological risks. Exemplification

Epidemics

Specific context

Epidemics are favored not only by poverty, the lack of hygiene, water infestation, overcrowding of the household waste, but also the transport facilities and globalization that have allowed the contamination of some populations at great distance from the place of release.

The Ebola hemorrhagic virus, Zika and other viruses or pathogens with a high degree of contamination are possible and probable in Romania, even though it

is at a great distance from the disease outbreak, edifying in this regard being the need for prophylactic measures and for response managed by the Ebola National Committee (turned into The National Committee for Highly Contagious Diseases).

Public health emergencies may take many forms – communicable disease epidemics, widespread incidents caused by contaminated food or water, extended periods of time without water and sewer services, exposure to biological agents, as well as infestations by vectors carriers of disease (insects or rodents). Public health emergencies may occur as primary events for themselves, or may be side events occurring as a result of another disaster or emergency, such as a flood or earthquake. The common characteristic of most public health emergencies is the fact that they have a negative impact on a large number of people. Depending on their magnitude, public health emergencies may be categorized as national, regional or local.

Likelihood and impact

Over time, several outbreaks of communicable diseases or epidemics which have been classified as public health emergencies have occurred. One of the main dangers of communicable diseases dangers is the fact that they may quickly overwhelm the healthcare system.

The impact on the population – the main effects on public health involve the threat or presence of disease, contamination or sanitation problems. Epidemics or pandemics have the potential to cause high morbidity and mortality, the associated medical costs, as well as reduced productivity and quality of life. The contamination may, at least temporarily, decrease the property value. The problem related to contamination and sanitation implies an effort and increased expenditures, as well as increasing the variety and the likelihood of occurrence of the disease. The facilities may be closed, as a means of preventing disease transmission or contamination, thereby causing a loss of services that are provided to the population (schools, for example). Medical resources may be overwhelmed and unable to cope with any additional needs. As traditional medical services become increasingly difficult to access (or if their quality decreases due to overexertion or lack of staff), a growing number of affected people may turn to alternative, less responsible and effective means and treatment (or abandon treatment altogether).

Acute respiratory infections (ARI), the flu and other cases compatible with the flu (ILI)

The supervision of these diseases is done at countrywide level, during the cold season (week 40 – week 20 of the next year), but also during summer, through the sentinel surveillance system, aiming to monitor the deaths caused by the flu and the circulation of flu viruses. In the last 8 seasons, ILI and ARI rates trend, as well as the number of flu cases was similar, excepting during May 2009 – May 2010,

when these were markedly elevated, in the international context of the flu with the AH1N1 pandemic virus.

The A/H1N1 flu incidence with the pandemic virus in the country was of 32.7%; larger agglomeration of cases was in Bucharest Municipality and Botoşani and Dâmbovița Counties.

The specific incidence by age has had the biggest value at the 5–14 age group, followed by the 15–29 age group; at the 70+ age group can be noticed the effect of residual immunity, materialized in the lowest-specific incidence.

Table no. 5

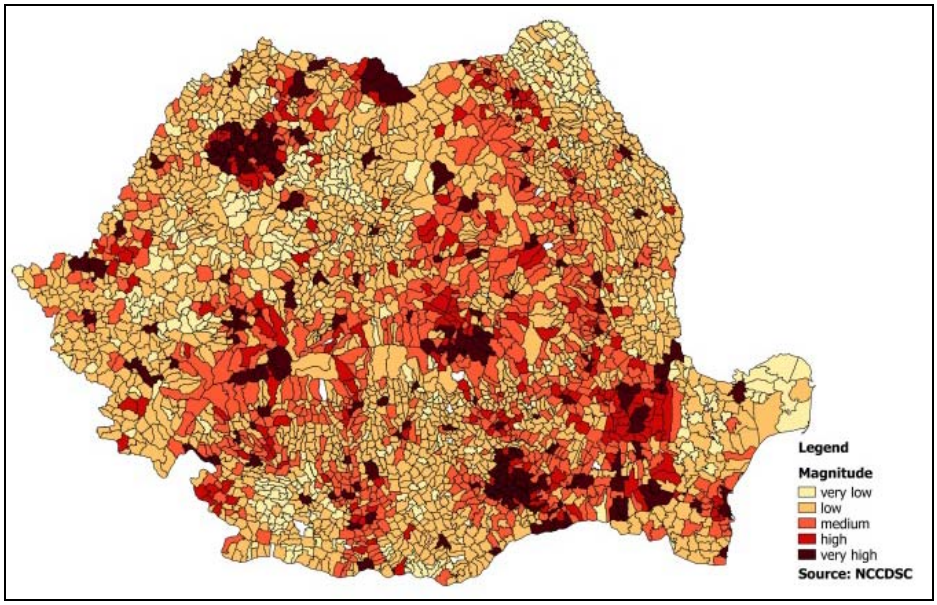
The distribution of the registered deaths of the confirmed cases of flu with the A/H1N1 pandemic virus by counties, in Romania, 24th March 2009 – 3rd April 2010.
Source: NCSCCD.

Age groups (years)	Number of confirmed cases	Number of deaths	Case-fatility rate
0–4	295	0	0.0
5–14	1398	4	0.3
15–29	2695	18	0.7
30–44	1400	59	4.2
45–59	947	33	3.5
≥60	273	8	2.9
Total	**7008**	**122**	**1.7**

Measles

The 2004–2005 measles epidemic reached almost 5 000 cases nationally, the age group most affected was the group under 1 year with an incidence of 554.57 cases per 100 000, followed by 1–4 years age group. In December 2005, the epidemic reached its peak, and measures were taken for intervention by vaccination. The hospitalization rate of the confirmed measles cases was 82.7% and the rate of complications with pneumonia were 40%. Also 13 deaths were registered. In some counties, the mode of transmission of measles was predominantly nosocomial in hospitals with paediatric profile, the vast majority of cases coming from hard to reach communities without provision of primary health care and prolonged hospitalization (*Map no. 3*).

The 2010−2012 measles epidemic totalled a number of 12.427 cases, with 3 deaths. The most affected age group was under 1 year, ineligible to measles vaccination (incidence reaching 770.9 cases per 100,000), followed by the age group 1–4 years (incidence 333.2 cases per 100,000). The rate of complications reached 72.8% in case of pneumonia. The most important measure taken was an additional MMR vaccination campaign for the unvaccinated or incompletely vaccinated children, aged 7 months to 7 years.



Map no. 3 – Measles case distribution 2006–2015.

Viral hepatitis type A

In 2014, 6,667 cases of viral hepatitis type A cases were registered, the national incidence being 31.34%/ 1000 inhabitants, with 154.7% more elevated than in 2013. The incidence rate was higher starting from 2012.

Viral hepatitis types B and C

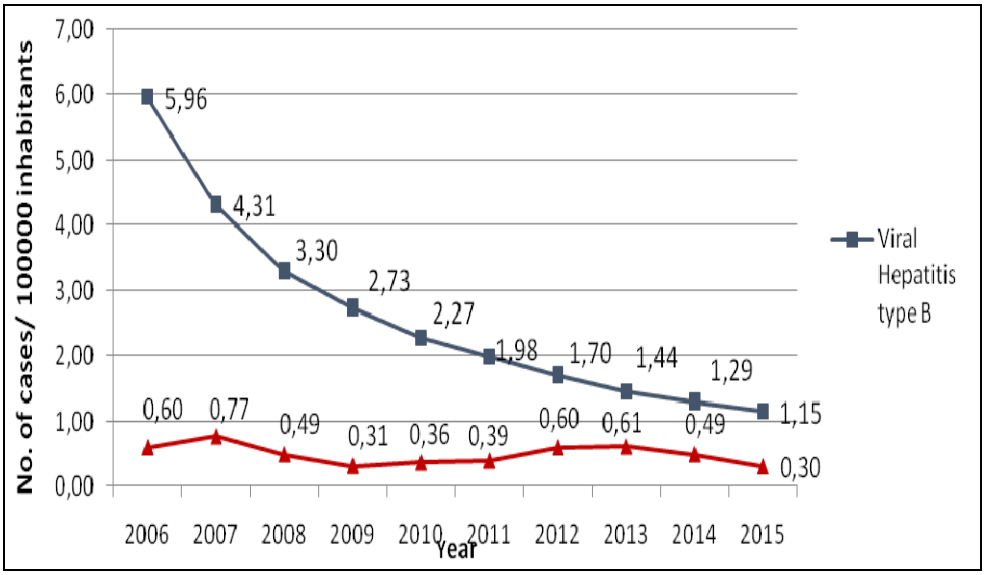
The Surveillance Methodology for the viral hepatitis types B and C was introduced in 2012. The evolution of the incidence of the viral hepatitis types B and C, in Romania, during 2006–2015, is presented in the graph below (*Graph no. 1*). A descending trend for the reported incidence of the viral hepatitis type B, along with minor variations, from one year to another, for the viral hepatitis type C can be noticed.

In 2015, the most cases of the *acute viral hepatitis type B* (26%) were registered in the 25–34 age group. The maximum rates of specific incidence were recorded in this age group in males (2.5%), respectively in the 35–44 age group in females (1.7%). In almost all age groups, except the 0−4 year olds, the incidence rates were higher in males. The maximum values of the incidence rate for the acute stage occurred in young adults (25–34 age group, followed by 35–44 year olds), while for the chronic stage, the number of cases is too low for a relevant comparison.

The possible transmission categories for the acute viral hepatitis type B, those mentioned with the highest frequency, were the heterosexual one (20.8%), followed by the nosocomial one (12.8%).

Graph no. 1

The evolution of the incidence of the viral hepatitis types B and C, during 2006–2015.
Source: NCSCCD



Regarding the possible nosocomial transmission of cases of acute viral hepatitis type B, dental maneuvers were mentioned in 2015 as well, with the highest frequency (6.2%), value comparable to that of year 2014 (5.6%). 5 deaths caused by the acute viral hepatitis type B were registered (the fatality rate 2.4%).

Referring to the *acute viral hepatitis type C*, in 2015 the maximum incidence rate was registered in the 55–64 age group for females (0.69%), respectively in the 45–54 age group for males (0.53%). The possible transmission category mentioned with the highest frequency was the nosocomial one (50%).

The impact on the population – the main effects on public health involve the threat or presence of disease, contamination or sanitation problems. Epidemics or pandemics have the potential to cause high morbidity and mortality, the associated medical costs, as well as reduced productivity and quality of life. The contamination may, at least temporarily, decrease the property value. The problem related to contamination and sanitation imply an effort and increased expenditures, as well as increasing the variety and the likelihood of occurrence of the disease. The facilities may be closed, as a means of preventing disease transmission or contamination, thereby causing a loss of services that are provided to the

population (schools, for example). Medical resources may be overwhelmed and unable to cope with any additional needs. As traditional medical services become increasingly difficult to access (or if their quality decreases due to overexertion or lack of staff), a growing number of affected people may turn to alternative, less responsible and effective means and treatment (or abandon treatment altogether).

Position on the risk matrix

Epidemics have alow to medium impact (2 – on the impact scale) and a high occurrence likelihood (5 – on likelihood axis) and are placed in the "yellow" area of the risk matrix. Most of the epidemics were that of flu and different types of Hepatitis. However, the Ebola hemorrhagic virus, Zika and other viruses or pathogens with a high degree of contamination are possible and probable in Romania, even though it is at a great distance from the disease outbreaks. One of the most frequent types of epidemics in Romania is the flu, their circulation being similar to that of Europe (*Figure no. 4*).

One of the most representative possible scenario is pandemic influenza projected over a period of 12 months, resulting a total number of over 2 milion cases, including over 44.000 deaths.

The highest exposure would initially be registered in the cities with high population density and in the cities with intense international circulation of people (where there are airports with increased air traffic). After approximately six weeks, illnesses spread across the country.

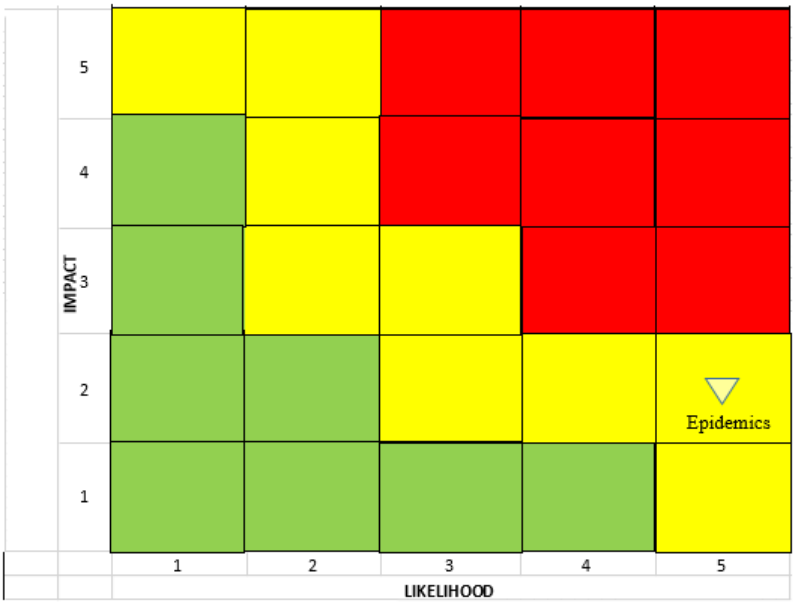


Figure no. 4 – The position of epidemics on the risk matrix.

3. NEEDS ASSESSMENT

The frequencies, diversity and the impact of disasters requires a constant, efficient management and a solid administrative capacity of responsible institutions involved in preventing, analyzing and managing emergency situations. A proper analysis of possible problems and inconsistencies in the management system should focus on the distinction between the level of these capacities and the needs, correlated with the nature of risks and the adequate response in case of the occurrence of a certain hazard.

In order to identify the main vulnerabilities and needs of the emergency management system, one should follow several aspects influencing the quality, number and level of performance of risk management related activities. The types of needs listed below were identified following also the existing action plans, regulation or strategies developed by different institutions with a relevant role in developing risk management related activities[16] (see *Annex no. 1*). These aspects are the following:

– **Institutional framework of risk management system** – needs related with this topic are referring to various regulations, procedures, laws, government decisions or ordinances, action plans, organizational arrangements, guidelines, budget allocation framework and other regulation specific to risk management activities falling under the responsibility of various institutions;

– **Human resources** – it refers both to needs related with the preparation of population in case of emergency (information, training, raise awareness activities etc.) as well as the quality of human resources involved in various risk management related activities (prevention, preparedness, response and post-event assessment);

– **Infrastructure and logistics** – includes references to various types of investments including constructions aiming at diminishing the impact of various

[16] The following documents were consulted during the elaboration of this chapter and the following one, containing the road map. For *nuclear accidents*: "National Strategy for Nuclear Safety" http://www.cncan.ro/assets/Informatii-Publice/Strategii-Planuri-Programe/Strategia-de-securitate-nucleara/HG-Strategie-2014.pdf, for *floods*: "National Strategy for Risk Management in case of Floods" http://www.mmediu.ro/app/webroot/uploads/files/2012-01-10_risc_inundatii_hg846din2010aprobaresnmri.pdf, for *drought*: "National Strategy for Reducing the Effects of Drought, preventing and combating land degradation and desertification in the short, medium and long" http://old.madr.ro/pages/strategie/strategie_antiseceta_update_09.05.2008.pdf, for *floods, drought, landslides*: "Romania's National Strategy on Climate Change 2013–2020" http://www.mmediu.ro/beta/wp-content/uploads/2012/10/2012-10-05-Strategia_NR-SC.pdf, for *epidemics, zoonoses*: Government Decision no. 320/2013 on The approval of the "National Intervention Plan to prevent mass illness out breaks in the general population and pandemics". http://www.ms.ro/documente/HG%20aprobare%20Plan%20national%20si%20SIEG_768_1514.pdf; for *all types of risks*: Strategy for Consolidation and Development of General Inspectorate for Emergency Situations 2016−2025, http://www.mai.gov.ro/documente/transparenta/SIGSU%202016-2025%2004%20august.pdf

hazards. This also includes the logistics needed for improving the performance of risk management related activities.

These categories of needs were further cross-checked with the main components of risk management. These are the following[17]:

– **Prevention** – all the actions carried out by the authorities responsible for identifying, evaluating and mitigate the risks of emergency situations in order to protect life, property and the environment against the adverse effects thereof;

– **Preparedness and response –** all the prior measures and actions, subsumed to the prevention and response activities, permanently carried out by the responsible authorities, as well as the actions carried out by the authorities responsible for planning, organizing, coordinating, and operational directing of the capabilities involved in the operative intervention in order to mitigate and eliminate the negative effects of the emergency situation, until the restoration of the normality provisional status;

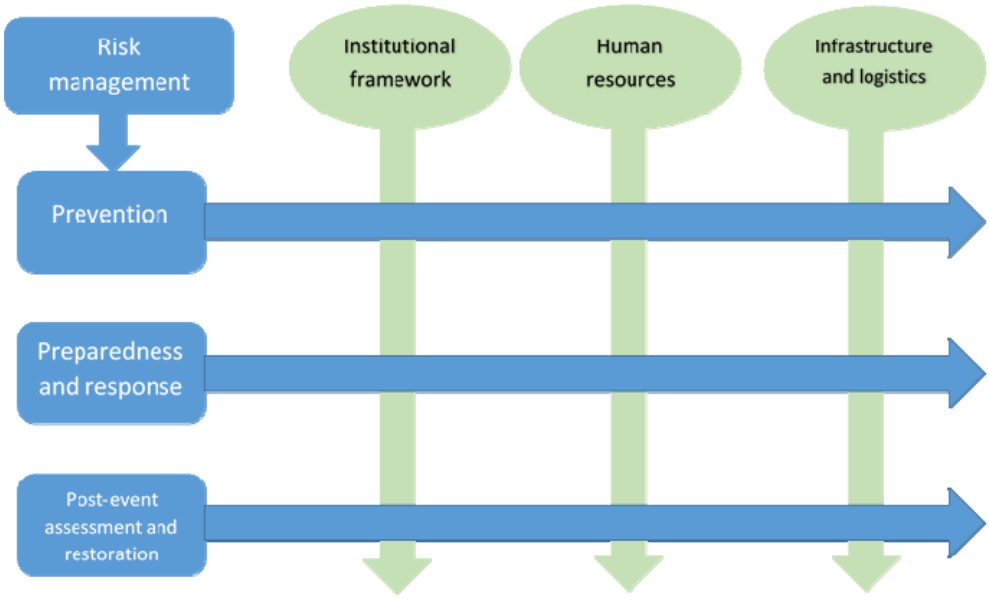


Figure no. 5 – Needs assessment matrix.

[17] The components of risk management were identified based on the provisions of G.D. no. 557 from 3 August 2016 – referring to risk management. According with this regulation there are several types of activities falling under 4 categories: prevention, preparedness, response, post-event assessment, restoration. These types of activities are covering the process of risk management and are developed under the responsibilities of various institutions from central and local public administrations.

– **Post event assessment and restoration –** all the actions carried out by the authorities responsible for identifying and quantifying the effects, causes and circumstances that resulted in an emergency or its associated events, as well as the measures and actions planned, prioritized and carried out further to the investigation/post-event assessment process, in order to restore the normality state.

This chapter explores the possible vulnerabilities and corresponding needs through analyzing the existing data correlated with the aspects listed above. They are organized in three categories: institutional framework, human resources, infrastructure and logistics. Each of these categories is further assessed for each of the main components of the risk management – prevention, preparedness and response and post-event assessment and restoration.

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Institutions, partners of GIES involved in elaboration of sectoral risk assessments:

– Nuclear and Radioactive Waste Agency
– The National Sanitary Veterinary and Food Safety Authority
– Institute for Economic Forecasting
– Institute of Geography of the Romanian Academy
– The Institute of Sociology
– National Institute of Research and Development for Physics of the Earth
– National Institute of Research and Development Urban Planning and Sustainable Territorial Development "URBAN INCERC"
– National Institute of Research and Development in Forestry "Marin Dracea"
– National Institute of Research and Development in Pedology, Agrochemistry and the Environment – ICPA Bucharest
– National Institute of Public Health
– Ministry of Environment and Climate Change
– Babeş-Bolyai University
– Technical University of Civil Engineering of Bucharest

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