

Interreg



Co-funded by
the European Union

NEXT Black Sea Basin

Imp@ct+

ASSESSMENT REPORT OF COMMUNITY NEEDS IN THE CONTEXT OF NATURAL DISASTER RISKS IN THE BLACK SEA BASIN

BSB00001

2025

CONTENT

1. Introduction.....	4
1.1 Purpose of the Report.....	4
1.2 Regional Context: The Black Sea Basin.....	5
1.3 Assessment Methodology.....	6
1.4 Partner Countries and Analyzed Areas.....	7
2. Identification and Analysis of Major Hazards.....	9
2.1 Hazard Selection Criteria.....	9
2.2 Earthquakes.....	10
2.3 Floods.....	11
2.4 Landslides.....	13
2.5 Storms and Extreme Weather Events.....	15
2.6 Fires (Natural and Man-Made).....	16
2.7 Other Locally Relevant Hazards.....	18
3. Analysis of Historical Emergency Situations.....	20
3.1 Timeline of Major Disasters in Recent Decades.....	22
3.2 Socio-Economic and Environmental Impact of Past Disasters.....	23
3.3 Lessons Learned and Institutional Responses.....	24

4. Analysis of Vulnerabilities in Rural Communities.....	25
4.1 Demographic and Socio-Economic Factors.....	25
4.2 Access to Services and Critical Infrastructure.....	26
4.3 Specific Geographic and Climatic Conditions.....	27
4.4 Vulnerable Groups and Marginalized Communities.....	28
5. Assessment of Local Resources and Capacities.....	28
5.1 Emergency Infrastructure and Response Capacity.....	29
5.2 Role of Local Authorities and Relevant Institutions.....	30
5.3 Contribution of Community Organizations and Volunteers.....	30
5.4 Gaps and Identified Needs in Risk Management.....	31
6. National Assessments wCountry Case Studies.....	31
6.1 Bulgaria.....	31
6.2 Georgia.....	44
6.3 Republic of Moldova.....	48
6.4 Romania.....	58
7. Conclusions and Recommendations.....	65

1. Introduction

1.1 Purpose of the Report

The primary objective of this assessment report is to identify, analyze, and gain an in-depth understanding of the natural and man-made disaster risks affecting rural communities in four representative regions of the Black Sea Basin: Galați County (Romania), Cahul District (Republic of Moldova), Varna Region (Bulgaria), and Imereti Region (Georgia). Through a transnational approach, the report aims to provide a coherent overview of the major hazards in the area, the social, economic, and institutional vulnerabilities of the communities, and the existing capacities for emergency management.

The goal is not merely to document past events or describe the current emergency response infrastructure, but to actively contribute to the formulation of strategic directions for risk reduction and resilience building. Thus, the report becomes a practical tool for local, regional, and national authorities, non-governmental organizations, and international actors involved in community development, urban planning, and civil protection.

By conducting a comparative assessment of four territories with different geographical and administrative realities, yet exposed to similar risks, the document offers a shared database, a set of applicable recommendations, and a platform for collaboration. In particular, the report supports the efforts of partners engaged in regional cooperation initiatives within European or international funding programs, contributing to informed decisions regarding investment, prevention, and training.

In the long term, the objective is to contribute to a structural transformation: shifting from a reactive model focused on post-disaster intervention to a proactive one centered on prevention, education, and community mobilization. This requires not only technical adaptation of infrastructure but also a mindset shift among local stakeholders and the general population.

1.2 Regional Context: The Black Sea Basin

The Black Sea Basin is one of the most dynamic and, at the same time, vulnerable regions in terms of geography, ecology, and geopolitics in Southeastern Europe. It encompasses territories from six countries—Romania, Bulgaria, Georgia, the Republic of Moldova, Turkey, and Ukraine—each with its own historical, administrative, and cultural specificities, yet connected by a shared hydrographic system, an increasingly unpredictable climate, and heightened exposure to the effects of climate change.

The area studied in this report accurately reflects the diversity and complexity of the region. From the low-lying and humid plains of Galați and Cahul, to the unstable slopes of Varna or the mountainous terrain of Imereti, the partner regions illustrate a wide spectrum of physical-geographical conditions that directly influence the types of risks they face. At the same time, all these regions struggle with similar challenges: uncontrolled urbanization in some areas, degradation of natural resources, heightened social vulnerability, outdated infrastructure, and uneven administrative capacity.

Another key element that defines the regional context is the interdependence of risks. Natural or man-made events occurring in one region can trigger cascading effects in neighboring countries—a cross-border industrial disaster, flooding on a shared river, or an extended drought can simultaneously affect multiple communities across different states. For this reason, isolated, national-level approaches to risk and emergency response are no longer sufficient. An integrated regional vision is needed, along with common response platforms and coordinated plans for reducing vulnerabilities.

In recent years, the Black Sea Basin has witnessed a visible intensification of extreme weather phenomena—violent storms, torrential rains, heatwaves, and persistent droughts—which have caused significant economic losses and exposed the limitations of local response capacities. In parallel, political instability, demographic pressures, and internal or external migration further increase the fragility of rural areas, especially in border regions.

In this context, the assessment of risks and community needs is no longer a technical exercise but a strategic necessity. It provides the foundation for planning sustainable and safe development in the region, based on knowledge, cooperation, and shared responsibility. The stakes are twofold: protecting the lives and property of exposed communities, and strengthening a resilient regional space capable of facing the challenges of the near future.

1.3 Assessment Methodology

To address the complexity of risks faced by rural communities in the Black Sea Basin, this report is based on an integrated methodology that combines qualitative and quantitative analysis, desk research, and consultation with local partners. The assessment process went beyond merely listing hazards—it aimed to deeply understand the interrelationships between exposure, vulnerability, and response capacity, with a focus on the specific context of each region involved.

The first step in the methodology was the identification of major hazards through the analysis of historical events over the past two to three decades. Official sources were used—including reports from local authorities, national statistics, and international databases (such as EM-DAT, Copernicus, or the EU JRC)—as well as information provided directly by local project partners. Emphasis was placed on the frequency and severity of events (human losses, material damages, impact on critical infrastructure), the type of hazard (natural, technological, biological, etc.), and its seasonality.

In parallel, an analysis of local vulnerabilities was conducted using demographic indicators (density, age structure, migration), socio-economic factors (income, employment, reliance on agriculture), and territorial aspects (access to roads and services, exposure to risks). This stage focused particularly on rural communities, often marginalized in national risk management plans. The data was further enriched through informal consultations with local authorities, regional SWOT analyses, and, where possible, field research.

A third pillar of the assessment was the analysis of local capacities—that is, the human, logistical, and institutional resources available for emergency prevention and response. Civil protection structures, technical equipment, the existence of local intervention plans, communication systems, and community involvement (volunteering, risk education, simulation exercises) were examined. Furthermore, the degree of cooperation between local, regional, and national institutions, as well as interaction with NGOs and international actors, was evaluated.

A defining element of the methodology was the comparative approach among the four regions. Although each region has its own specificities, the cross-cutting analysis enabled the identification of common patterns, as well as significant differences

regarding hazard typology, population vulnerability, and institutional response. This comparative framework provides the foundation for formulating both general and context-specific recommendations.

Lastly, the methodology was guided by participatory and transparent principles. All project partners actively contributed to data provision and validation, and the analysis was developed collaboratively, balancing technical expertise with local knowledge. Although the nature of the study is analytical, its ultimate purpose is practical: to support local and regional planning through relevant, accessible, and action-oriented information.

1.4 Partner Countries and Analyzed Areas

The assessment presented in this report was carried out within the framework of a transnational partnership that brings together four representative regions from the Black Sea riparian countries: Romania, the Republic of Moldova, Bulgaria, and Georgia. These regions were selected not only for their geographical relevance but also for their socio-economic diversity, exposure to major risks, and their potential to actively contribute to the development of a regional framework for disaster management cooperation.

Romania – Galați County

Located in the eastern part of the country, at the confluence of the Prut, Siret, and Danube rivers, Galați County is an area with a medium population density and a significant share of rural inhabitants. Characterized by low-lying plains and unstable slopes, the territory is frequently exposed to floods, drought, landslides, and extreme weather events. Economic activity is concentrated in agriculture, industry, and services, with considerable disparities between the urban area (the city of Galați) and the surrounding villages. In the context of climate change and the rapid depopulation of rural areas, Galați faces heightened vulnerability to disasters, despite having a well-organized institutional infrastructure.

Republic of Moldova – Cahul District

Cahul is a district in the southwestern part of the Republic of Moldova, located along the border with Romania, near the confluence of the Prut and Danube rivers. The area is predominantly rural, with a population affected by external migration, high poverty levels, and limited access to modern public services. Economic activities are primarily agricultural, and the territory is periodically affected by droughts, hailstorms, floods, and wildfires. Civil protection infrastructure is modest, and the local authorities' response capacity is limited. Nevertheless, the district's geographical position and the authorities' experience in managing recurrent disasters make Cahul a key area in the analysis of cross-border risks in the Prut basin.

Bulgaria – Varna Region

Varna is one of Bulgaria's most important administrative regions, with direct access to the Black Sea. In addition to the city of Varna, the region includes a significant number of rural localities, which are often affected by landslides, floods, and technological hazards stemming from the nearby industrial complexes in Devnya. The region benefits from more developed infrastructure compared to other rural areas analyzed, but internal disparities between urban centers and isolated villages remain evident. Moreover, urban dynamics, tourism pressure, and climate change place increasing strain on environmental systems and disaster response capacity. Varna also stands as a good practice example in urban planning and the integration of preventive measures into municipal strategies.

Georgia – Imereti Region

Imereti is located in western Georgia, with predominantly mountainous terrain and a variable climate influenced by both the Black Sea and air masses from the Caucasus. Rural areas in Imereti are dispersed, difficult to access, and exposed to major risks such as landslides, flash floods, geological collapses, and violent storms. The population is affected by migration, and household structures are economically fragile.

At the same time, the region has a history marked by natural disasters, which has led to increased interest in building local capacities and integrating risk into regional planning. International projects implemented in Imereti have laid the groundwork for promising initiatives in geological monitoring and community resilience building.

Together, these four regions offer a coherent and representative framework for understanding risks in the Black Sea Basin. They reflect both the geographical and administrative diversity of the region, as well as the common challenges that rural communities face in the context of disasters. The comparative study of these territories allows for the identification of recurring patterns, strengths, and critical vulnerabilities, and, most importantly, creates the foundation for sustainable regional cooperation grounded in applied knowledge.

2. Identification and Analysis of Major Hazards

2.1 Hazard Selection Criteria

To identify the relevant hazards in the partner regions, the following criteria were applied: frequency of occurrence over the past 10–20 years, severity of impact (human losses, material destruction, damage to infrastructure), the degree of community vulnerability, the presence of aggravating factors (climatic, geographic, or man-made), and the institutional capacity for response and prevention. Information was collected from official documents provided by local authorities, technical reports, national studies, and international disaster databases.

The selected hazards are those which, according to the conducted analyses, pose a significant risk to rural communities and have the potential to affect the socio-economic development and stability of the regions. These hazards include both natural and man-made risks and will be analyzed in detail in the following subsections.

2.2 Earthquakes

Earthquakes

Earthquakes represent one of the most destructive forms of natural hazards, with the potential for catastrophic impact on human communities, especially in areas that are poorly prepared or have vulnerable infrastructure. In the Black Sea Basin, seismic risk is unevenly distributed, but it holds significant relevance across all four regions analyzed.

In **Romania**, particularly in the Galați area, the territory lies under the direct influence of the Vrancea seismic zone—one of the most active in Europe. Earthquakes originating in this region can reach high magnitudes and affect vast areas of southeastern Romania. Although the epicenter is located in Vrancea, seismic waves propagate and can cause damage in Galați County, especially in rural areas, where buildings are often old, unreinforced, and not compliant with seismic safety standards. In 2018, the Galați County Council commissioned a specialized company (Search Corporation SRL Bucharest) to develop a risk map covering 19 localities, particularly areas with massive earthworks near the Danube and Lake Brateș. This included physical-geographic analyses, assessments of seismic and landslide conditions and effects, seismic risk scenarios, documentation on slope stabilization works, and a strategy for preventing and mitigating the effects of natural hazards. Broadly speaking, the report highlights that in urban areas, seismic risk is amplified by soil subsidence and underground water saturation caused by leakage in public utility networks. It also recommends reinforcement of the Danube bank near the city of Galați (which could collapse into the river, along with dozens of apartment blocks, in the event of a major earthquake similar to the 1977 quake—magnitude 7.5 on the Richter scale) and of the slopes surrounding Lake Brateș, which pose a serious threat to national road DN 26 and the Galați–Bârlad–Iași railway.

In the **Republic of Moldova**, the southwestern area—including Cahul District—is also exposed to seismic risks generated by the same Vrancea zone. Although the perceived intensity is lower than in Romania, the vulnerability of infrastructure and lack of reinforcement measures increase the risk of significant damage. Furthermore, national legislation does not impose strict standards for earthquake-resistant construction, and risk assessments are rarely implemented systematically.

In **Bulgaria**, the Varna region is exposed to both internal and external seismic sources. While the frequency of earthquakes is lower compared to other hazards, Bulgarian seismologists classify the area as having moderate seismic risk due to the potential for earthquakes up to magnitude 7 on the Richter scale, which could affect the Black Sea coast and nearby urban and rural areas. The absence of modern seismic standards in rural construction contributes to an increased risk in the event of a major seismic event.

In **Georgia**, the Imereti region is located in an active seismic zone. Earthquakes in this region can reach high intensities and are often accompanied by landslides and collapses in mountainous areas. In recent years, Georgian authorities have recorded an increase in medium-intensity seismic events, highlighting the need for improved monitoring and prevention measures. Recent studies have shown that many rural communities in the region lack preparedness, particularly in terms of public education and seismic retrofitting of buildings.

Port infrastructure along the Black Sea and coastal areas has also been severely affected by past earthquakes, such as the 1999 Turkey earthquake (magnitude 7.6 on the Richter scale) and the 1927 Crimea earthquake (magnitude 6.8), both of which had far-reaching regional impacts.

In conclusion, although seismic risk distribution varies across regions, earthquakes remain a hazard with potentially devastating impact. The lack of building reinforcement, low levels of public awareness and preparedness, and the absence of clear evacuation or intervention plans increase vulnerability. An integrated, cross-border approach is essential—not only for prevention but also for the development of effective rapid response mechanisms in the event of a major earthquake

2.3 Floods

Floods are among the most frequent and devastating types of natural disasters in the Black Sea Basin, with significant impact on rural communities. The high frequency of heavy rainfall, the unpredictable nature of torrential downpours, the absence or poor maintenance of drainage infrastructure, and the location of many settlements in low-lying areas make this hazard common across all four regions analyzed. Additionally, the

rising level of the Black Sea has led to coastal erosion and has affected seaside communities.

Galați County is crossed by numerous waterways, including the Danube and the Prut Rivers, both of which pose a high risk of flooding—especially in spring, due to snowmelt, and in summer, due to torrential rains. The floods of 2013 and 2024 illustrated the potential impact: dozens of localities were affected, thousands of households were evacuated, and road and agricultural infrastructure suffered severe damage. Rural areas were the most exposed, mainly due to the absence of protective levees, inadequate sewage systems, and a lack of early warning mechanisms.

Cahul constantly faces the risk of flooding caused by the overflow of the Prut River, as well as rapid water accumulation in urban and peri-urban areas. The 2008 floods led to the evacuation of residents from several villages and caused considerable damage to households and agricultural land. The Prut River rose by 30 cm per day, exceeding the local authorities' response capacity. The absence of a national risk assessment system further hinders the implementation of proactive measures. Additionally, climate change and soil degradation worsen the trend of rapid water accumulation.

Floods in the **Varna region** frequently result from torrential rainfall, particularly in urban areas with impermeable surfaces. In the lower parts of cities within the region, drainage systems are overwhelmed by the volume of accumulated water, leading to street flooding that affects homes, public institutions, and road infrastructure. In rural areas and steep valleys, runoff from heavy rain causes accelerated erosion and damages agricultural land. A notable example is the 2014 event in Varna's Asparuhovo district, where a flash flood caused fatalities and completely destroyed several homes. Under these conditions, prevention depends on infrastructure modernization and the establishment of effective early warning and rapid response systems.

Imereti is heavily affected by recurrent flooding, particularly in the Rioni River basin and its tributaries. Events in 2005, 2008, 2010, and 2018 impacted dozens of communities, resulting in material losses of millions of GEL and disruptions to roads, water supply systems, and electricity grids. In addition to rainfall accumulation, heavy snowfalls and their rapid melting contribute to rising water levels. Rural communities are especially vulnerable due to limited access to emergency networks and geographic isolation during the rainy season. In 2014, floods in Kutaisi affected over 30 homes and were followed by a series of landslides caused by soil saturation. In recent years, national disaster risk reduction projects have begun to include the construction of flood protection infrastructure and community education on hydrological hazards.

Although the nature of flooding differs slightly from one region to another—caused by large rivers, torrents, or urban runoff—a common pattern of structural vulnerability is evident: poor drainage system maintenance, low response capacity in rural areas, and the absence of clear evacuation and response plans. In all four regions, the lack of risk maps and early warning systems exacerbates exposure to this type of hazard. At the same time, climate change is intensifying the phenomenon, highlighting the urgent need for inter-institutional planning based on data, including investments in infrastructure, reforestation, and the strengthening of community-level adaptation and response capacities.

2.4 Alunecări de teren

Floods are among the most frequent and devastating types of natural disasters in the Black Sea Basin, with significant impact on rural communities. The high frequency of heavy rainfall, the unpredictable nature of torrential downpours, the absence or poor maintenance of drainage infrastructure, and the location of many settlements in low-lying areas make this hazard common across all four regions analyzed. Additionally, the rising level of the Black Sea has led to coastal erosion and has affected seaside communities.

Galați County is crossed by numerous waterways, including the Danube and the Prut Rivers, both of which pose a high risk of flooding—especially in spring, due to snowmelt, and in summer, due to torrential rains. The floods of 2013 and 2024 illustrated the potential impact: dozens of localities were affected, thousands of households were evacuated, and road and agricultural infrastructure suffered severe damage. Rural areas were the most exposed, mainly due to the absence of protective levees, inadequate sewage systems, and a lack of early warning mechanisms.

Cahul constantly faces the risk of flooding caused by the overflow of the Prut River, as well as rapid water accumulation in urban and peri-urban areas. The 2008 floods led to the evacuation of residents from several villages and caused considerable damage to households and agricultural land. The Prut River rose by 30 cm per day, exceeding the local authorities' response capacity. The absence of a national risk assessment system further hinders the implementation of proactive measures. Additionally, climate change and soil degradation worsen the trend of rapid water accumulation.

Floods in the **Varna region** frequently result from torrential rainfall, particularly in urban areas with impermeable surfaces. In the lower parts of cities within the region, drainage systems are overwhelmed by the volume of accumulated water, leading to street flooding that affects homes, public institutions, and road infrastructure. In rural areas and steep valleys, runoff from heavy rain causes accelerated erosion and damages agricultural land. A notable example is the 2014 event in Varna's Asparuhovo district, where a flash flood caused fatalities and completely destroyed several homes. Under these conditions, prevention depends on infrastructure modernization and the establishment of effective early warning and rapid response systems.

Imereti is heavily affected by recurrent flooding, particularly in the Rioni River basin and its tributaries. Events in 2005, 2008, 2010, and 2018 impacted dozens of communities, resulting in material losses of millions of GEL and disruptions to roads, water supply systems, and electricity grids. In addition to rainfall accumulation, heavy snowfalls and their rapid melting contribute to rising water levels. Rural communities are especially vulnerable due to limited access to emergency networks and geographic isolation during the rainy season. In 2014, floods in Kutaisi affected over 30 homes and were followed by a series of landslides caused by soil saturation. In recent years, national disaster risk reduction projects have begun to include the construction of flood protection infrastructure and community education on hydrological hazards.

Although the nature of flooding differs slightly from one region to another—caused by large rivers, torrents, or urban runoff—a common pattern of structural vulnerability is evident: poor drainage system maintenance, low response capacity in rural areas, and the absence of clear evacuation and response plans. In all four regions, the lack of risk maps and early warning systems exacerbates exposure to this type of hazard. At the same time, climate change is intensifying the phenomenon, highlighting the urgent need for inter-institutional planning based on data, including investments in infrastructure, reforestation, and the strengthening of community-level adaptation and response capacities.

2.5 Storms and Extreme Weather Events

Storms and extreme weather phenomena—including strong winds, hail, gales, and sudden temperature shifts—are increasing in both intensity and frequency throughout the Black Sea Basin. Cyclones and powerful storms in 2012, 2016, and 2020 that swept across the Black Sea destroyed port infrastructure, caused shipwrecks, and impacted tourism. These climatic manifestations, accelerated by the effects of climate change, exert significant pressure on rural communities, where infrastructure is often poorly protected and early warning systems are either nonexistent or ineffective.

In recent years, **Galați County** has experienced severe episodes of extreme weather events, marked by wind gusts exceeding 80 km/h, hail, and heavy rain over short periods. These events have led to the destruction of rooftops, damage to power lines and agricultural crops, and temporary interruptions in public services in isolated villages. In the absence of a local weather alert system and rapid response plans, communities are caught off guard, which increases the scale of losses. Farmers are among the most affected, especially as irrigation systems and crop protection technologies are underdeveloped in the region.

Cahul frequently experiences violent storms and hailstorms that have consistently affected local agriculture. Between 2010 and 2020, 49 hail events were recorded, and strong winds damaged power grids, rooftops, and plantations. After frost damage, the most significant economic losses in the district are attributed to heavy rainfall and hail. Climatological data show a growing trend in the intensity of these events, without adequate expansion of protective measures such as forest belts or alert systems. In rural areas, access to real-time weather information is limited, which lowers the population's preparedness capacity.

The **Varna region** is influenced by atmospheric currents from the Black Sea, making it susceptible to storms and strong winds, particularly during seasonal transitions. Bulgarian experts have reported storm events with wind speeds exceeding 100 km/h, causing significant damage to infrastructure, especially in rural areas. Drainage systems are often overwhelmed by the volume of water from torrential rains, which intensifies the effects of storms. In rural communities, sheet metal roofs, utility poles, and agricultural crops are particularly vulnerable. Risk reports indicate a rise in the frequency of such phenomena, but the authorities' response remains predominantly reactive due to the lack of integrated climate adaptation plans.

The **Imereti region** is one of the most affected areas in Georgia when it comes to strong winds and seasonal storms. Between 2009 and 2015, at least 10 major events were recorded, with wind speeds of 20–30 m/s, leaving tens of thousands of homes without electricity and causing damage to communication and transport infrastructure. In some cases, these phenomena were accompanied by torrential rains that led to flash floods. The lack of natural protective networks (such as forests or vegetation barriers) and the absence of a modern weather warning system in rural areas increase the risk to the population. Although authorities have recently installed weather monitoring stations in some localities, response capacity remains low.

Storms and extreme weather events are a visible result of climate change, but they also interact with systemic vulnerabilities—fragile infrastructure, exposed agriculture, and the absence of climate education among the population. In all the analyzed regions, there is an urgent need to:

- expand early warning systems and adapt them to rural contexts;
- develop community-based rapid response plans for extreme weather events;
- implement natural protective measures (windbreaks, forest belts);
- support farmers through insurance programs and crop protection technologies.

Without these interventions, the economic and social impact of such phenomena will continue to grow, directly affecting food security, public health, and the well-being of rural communities.

2.6 Fires (natural and arson)

Fires—whether wildfires, urban, or industrial—pose a real threat to the safety of communities in the Black Sea Basin, especially in the context of increasingly frequent droughts and uncontrolled human interventions in the environment. Fire risk is worsened by the lack of effective prevention systems, outdated equipment in local intervention units, and unsafe behaviors by the population—such as burning dry vegetation or using open flames near forested areas.

In **Galați**, fire risk is particularly high during summer, especially in plains and hilly areas where dry vegetation easily ignites. Stubble burning, an agricultural practice still used in rural areas, often sparks fires that can spread uncontrollably and damage homes, forests, or infrastructure. Moreover, the absence of specialized firefighting teams in every rural locality makes rapid interventions difficult. The Galați County Emergency Inspectorate (ISU) conducts regular awareness and training campaigns, but public knowledge remains low, especially in isolated communities.

Cahul frequently experiences wildfires, particularly between March and October, when precipitation is low and temperatures are high. In recent years, hundreds of hectares of farmland and pasture have been affected annually. A major risk is posed by the proximity of some fires to industrial zones, such as the 2023 incident in Giurgiulești, when a vegetation fire approached grain silos. Although a disaster was avoided, the event highlighted the lack of clear intervention protocols in mixed-risk scenarios—fire combined with technological hazards. Additionally, civil protection volunteerism is underdeveloped, which limits local response capacity.

In the **Varna region**, fires affect both forested areas and urban or peri-urban zones. The hot, dry summer climate increases the likelihood of forest fires, which can sometimes spread to inhabited areas. In industrial zones—particularly near chemical plants in Devnya—fire risk is elevated by the presence of flammable substances. Urban fires, though less frequent, have caused major damage in the past due to the lack of automatic extinguishing systems and high building density. Statistics show that over 20% of firefighter interventions in the region are fire-related. Educational programs in schools and the training of volunteer response teams are underway but have limited coverage in rural areas.

In **Imereti**, wildfires and vegetation fires are exacerbated by the region's mountainous terrain, which limits access and delays rapid interventions. Situations become critical during droughts, when high temperatures and strong winds lead to rapid fire spread. In some communities, fires have led to the loss of valuable forests and the evacuation of residents. Intervention equipment is often outdated, and local authorities are insufficiently equipped. Additionally, many traditional houses are made of wood, increasing the risk of fire spreading in densely populated areas. In recent years, the Georgian government has launched programs to train young volunteers and install early detection systems in vulnerable forests.

Across all four regions, fires are often underestimated compared to other risks, despite causing significant damage and triggering chain events (fire – explosion –

pollution). The lack of cooperation between civil protection structures, forestry authorities, and local administrations limits intervention efficiency. The following measures are urgently needed:

- development of updated fire risk maps;
- prohibition and enforcement of bans on burning dry vegetation;
- investments in modern equipment for rapid response;
- development of volunteer networks and community training;
- installation of automatic detection and surveillance systems in forests and industrial areas.

In a context of climate instability and limited administrative resources, **prevention remains the most effective strategy against fires.**

2.7 Other locally relevant hazards

In addition to the major natural hazards analyzed previously, rural communities in the Black Sea Basin also face a range of local risks that, while not occurring on a large scale or with the same regularity, have significant impacts. These hazards include epidemics (human and animal), transport accidents, rising radiation levels, karst-type geological instability, extreme drought, and compound risks resulting from the overlap of multiple factors (e.g., natural hazard + technological accident).

The Black Sea itself is also affected by pollution from the oil industry and maritime transport. Among the maritime accidents, two events had particularly devastating impacts:

- **Sinking of the cargo ship "Tolstoy" (2004)** – Spill of hazardous chemicals.
- **Kerch Strait incident (2007)** – A severe storm caused multiple shipwrecks and the spillage of over 1,300 tons of fuel oil into the Black Sea.

Public health emergencies, such as the **COVID-19 pandemic (2020–2022)**, also significantly affected the region's economy, particularly tourism and maritime transport.

Geopolitical conflicts between neighboring countries—such as the ongoing war between Ukraine and Russia (2014–present) and the 2008 conflict between Russia and Georgia—

have had and continue to have a major impact on the Black Sea region, particularly in terms of maritime security, the economy, and supply chains.

At the local level, **Galați County** periodically faces biological risks, particularly outbreaks of avian flu and African swine fever, which affect individual households and rural farms. These epidemics have a direct impact on the local economy, especially in villages where animal husbandry is the main source of income. Additionally, climate change has led to more frequent and prolonged droughts, affecting water supply and agriculture. The county also has a history of road and rail transport incidents due to outdated infrastructure, and the lack of local rapid response plans limits emergency response capacity in case of mass-casualty accidents.

In **Cahul**, an emerging hazard is extreme drought, which affects staple crops (wheat, corn, sunflower) each year. The lack of irrigation systems and degradation of agricultural soil have turned this into a constant threat to local food security. The area is also exposed to health risks, particularly due to aging water networks, which can lead to waterborne disease outbreaks. In the past, cases of hepatitis A and food poisoning were reported, especially during the summer. Additionally, the proximity to the Giurgiulești border crossing increases the risk of transport accidents involving hazardous chemical or biological materials, due to the high volume of freight traffic.

In **Varna**, chemical contamination risks are significant near industrial areas, especially in **Devnya**, where large quantities of toxic substances (ammonia, nitric acid, chlorine) are stored. A major incident could result in air and water pollution, affecting nearby communities. Elevated radiation levels have also been reported in some areas, caused by industrial activity or uncontrolled sources. Geological instability is also present, particularly due to the formation of **karst cavities**, which can lead to localized collapses—especially in the northern parts of Varna and near stone quarries. Although these risks are localized, they can have severe effects on communities, particularly in the absence of standard alert and evacuation procedures.

In **Imereti**, in addition to previously discussed natural disasters, biological and social risks are notable. Annual outbreaks of flu and digestive illnesses occur in communities with limited access to potable water and sanitation. The region is also crossed by dangerous **mountain roads**, with frequent transport accidents, especially during winter. Some localities are affected by **underground collapses** caused by abandoned and unmapped former mining galleries. This phenomenon, combined with landslides, creates a complex geological risk that threatens homes and local

infrastructure. Additionally, **social risks**—such as massive labor migration and population aging—reduce communities' ability to respond effectively to emergencies.

These local hazards, while less spectacular than major natural disasters, have profound and long-lasting effects on community development. They highlight the need for a **multisectoral approach** in risk assessment and management, which should include:

- Integration of biological and social risks into local civil protection plans;
- Monitoring and prevention of technological accidents near industrial infrastructures;
- Development of local response capacities for "silent" risks such as drought, water contamination, or underground instability;
- Enhancing community resilience through diversified livelihoods, education, and civic engagement.

A comprehensive risk assessment cannot ignore these local dimensions, and interventions must be tailored to the realities of each community analyzed.

3. Analysis of Historical Emergencies

Analysis of Historical Emergency Situations

The assessment of risks and vulnerabilities in rural communities of the Black Sea Basin cannot be considered complete without a detailed analysis of past emergency events. Studying historical events provides essential insights into the frequency and severity of disasters, how authorities and communities responded, and the lessons learned and corrective measures adopted—or, in some cases, ignored. This information forms a solid foundation for future planning, loss prevention, and resilience-building at the local level.

The most significant emergencies in **Galați County** occurred in **September 2013** and **September 2024**, when extreme rainfall caused flooding in dozens of localities, resulting in loss of life, the evacuation of thousands of residents, and the destruction of thousands of homes. These events highlighted the absence of early warning systems, local evacuation plans, and adequate population preparedness for major disasters. In **2005**, a massive landslide isolated several villages, and intervention was delayed due to

damaged access infrastructure. In **2006** and **2007**, prolonged drought compromised over 60% of the county's agricultural production, with economic losses estimated in the tens of millions of lei. These repeated episodes underscored the need for investment in prevention, but implementation of measures has been uneven and partial across localities.

In **Cahul District**, one of the most severe emergencies occurred in **July 2008**, when the overflow of the Prut River caused major flooding in the villages of Giurgiulești, Brânza, and Slobozia Mare. Dozens of households were completely destroyed, and access to vital resources (water, food, electricity) was cut off for several days. Local authorities were overwhelmed logistically, and central government support arrived late. Between **2012 and 2015**, several episodes of severe drought affected agricultural crops and led to a temporary rural population exodus. In **2021**, a hepatitis A outbreak occurred among children in two villages, caused by contaminated water sources, highlighting the fragility of utility networks in the face of public health risks.

One of the most dramatic events in the recent history of the **Varna region** was the **I ash I ood in June 2014** in the Asparuhovo district. Within a few hours, torrential rain led to a flood that completely destroyed dozens of homes, killed 13 people, and caused material damage estimated at over €10 million. Subsequent investigations revealed the absence of adequate drainage systems, uncontrolled urban development, and a lack of timely warnings for the population. In **2012**, the region was hit by an extreme heatwave which, combined with strong winds, triggered over 120 wildfires in rural areas. In **2020**, several localities were isolated due to landslides caused by rapid snowmelt.

Imereti is a region where severe natural events occur with alarming frequency. In **March 2005**, floods caused by snowmelt and heavy rainfall affected hundreds of households in the municipalities of Tskaltubo, Vani, and Kutaisi, with material losses estimated at over 10 million GEL. In **August 2017** and **October 2018**, strong storms and torrential rains paralyzed traffic, caused flooding, and damaged power supply systems. In **2023**, although located outside Imereti, the disaster in **Racha-Lechkhumi** had repercussions throughout western Georgia. The **August 3rd** event was a rare combination of landslide, flash flood, and geological collapse, resulting in **33 deaths** and damages estimated in the tens of millions of GEL. It prompted authorities to reevaluate emergency response policies and expand the network of geological and meteorological monitoring stations.

The analysis of historical emergencies across the regions confirms the existence of **recurring patterns**: institutional and community unpreparedness, delayed response

during the critical first hours, insufficient local resources, and a low level of public awareness regarding risks. At the same time, these events have, in some cases, triggered institutional reforms, infrastructure investments, and the development of local civil protection plans. However, approaches remain **uneven and fragmented**. The **mainstreaming of best practices** and **cross-border cooperation** remain essential for building a regional risk management system based on historical data, effective anticipation, and prevention.

3.1 Chronology of the main disasters in recent decades

In the past two to three decades, the partner regions involved in the project—**Galați** (Romania), **Cahul** (Republic of Moldova), **Varna** (Bulgaria), and **Imereti** (Georgia)—have been affected by a wide range of natural disasters and emergency situations. The significant events identified during the research include:

Romania – Galați:

- **1977:** A 7.4-magnitude earthquake severely impacted Romania and Bulgaria, causing loss of life and structural damage in Galați County.
- **2005:** Heavy rainfall across Romania, Bulgaria, Turkey, and Georgia led to rising river levels and severe flooding, affecting ports and coastal cities. The rising level of the Black Sea caused coastal erosion, endangering coastal communities.
- **2005:** Major landslide in the Nicorești area, Galați County, affecting dozens of households.
- **2006–2007:** Severe drought resulting in agricultural losses of over 60%.
- **2012, 2016, 2020:** Strong cyclones and storms in the Black Sea destroyed port infrastructure, caused shipwrecks, and impacted tourism.
- **2013:** Catastrophic floods affected **39 localities**, causing **9 fatalities**. Thousands of houses and hectares of agricultural land were submerged, and over **8,000 people** were evacuated. The floods caused extensive material damage to hundreds of bridges and culverts, two national roads, 11 county roads, dozens of local and village roads, and a segment of railway.

- **2024:** Floods destroyed **7,000 homes** in **28 localities** of Galați County. The national road connecting Galați to Tecuci turned into a lake stretching over several kilometers.

Republic of Moldova – Cahul:

- **2008:** Flooding caused by the overflow of the Prut River—dozens of homes destroyed.
- **2012–2015:** Repeated agricultural drought with significant impact on food supply and rural household income.
- **2021:** Hepatitis A outbreak in villages with poor access to drinking water.

Bulgaria – Varna:

- **2012:** Wildfires and extreme heatwaves.
- **2014:** Devastating flash flood in Asparuhovo district—**13 deaths**, hundreds of homes damaged.
- **2020:** Landslides caused by rapid snowmelt.

Georgia – Imereti:

- **2005:** Severe flooding in the Rioni River basin.
- **2011–2015:** Windstorms with speeds over **30 m/s**, leaving hundreds of thousands without electricity.
- **2023:** The disaster in the neighboring **Racha-Lechkhumi** region resulted in **33 deaths** and had indirect impacts in Imereti.

This chronology highlights a **rise in the frequency and intensity** of such events, as well as a trend toward increasing **impact on infrastructure and vulnerable rural populations**.

3.2 Socio-economic and ecological impact of previous disasters

The disasters that occurred in the analyzed regions have had a significant impact on local socio-economic conditions and ecological balance.

From an **economic perspective**, the most severely affected sectors were:

- **Agriculture**, especially in the regions of Galați and Cahul, where drought, floods, and hailstorms have caused annual losses amounting to tens of millions of euros/lei/MDL;
- **Road and utility infrastructure**, often destroyed or severely damaged—particularly in Imereti and Varna, where access to villages was cut off for several days;
- **Housing**, especially in rural areas where buildings were constructed without resilience standards—thousands of households were directly affected in the past 20 years in Galați and Varna alone.

From a **social perspective**, disasters have led to:

- **Temporary or permanent migration** of the population from affected areas (notably in Moldova and Georgia);
- **Increased vulnerability** of marginalized groups (the elderly, children, and persons with disabilities);
- **Loss of livelihoods** in communities heavily dependent on agriculture.

From an **ecological perspective**, the most visible effects include:

- **Soil erosion and loss of fertile topsoil** due to landslides and floods;
- **Water and soil pollution** with waste or hazardous substances following technological accidents;
- **Destruction of natural habitats** (forests, wetlands) as a result of wildfires or uncontrolled water expansion.

3.3 Lessons learned and institutional responses

Past experiences have revealed both systemic weaknesses in disaster response and examples of good practices that can be replicated or further developed.

Observed weaknesses:

- Lack of functional local early warning systems, particularly in rural areas;
- Absence or ineffective implementation of local civil protection plans;

- Poor coordination between local, regional, and national levels during the response phase;
- Outdated equipment and insufficient human resources in emergency services.

Positive responses and recent initiatives:

- In **Romania**, following the 2013 floods, several county-level intervention plans were developed, and European funds were invested in protective infrastructure (e.g., levee reinforcements); however, the measures proved insufficient during the devastating 2024 floods.
- In **Moldova**, a program was launched to equip the Emergency Situations Service with generators and rapid response equipment.
- In **Bulgaria**, hazard risk maps were developed for major threats and are now used in urban and rural planning.
- In **Georgia**, through a **UNDP** project, geo-monitoring stations were installed and a digital forecasting and alert platform was created for flood and landslide events.

However, many of these measures remain isolated or in their early stages. The **lack of an integrated risk management system** and the **absence of a community preparedness culture** continue to pose major barriers in all four regions.

4. Vulnerability Analysis of Rural Communities

4.1 Demographic and socio-economic factors

Rural communities in the partner regions of the Black Sea Basin are characterized by a series of common vulnerabilities driven by demographic and socio-economic factors. These vulnerabilities determine both the level of exposure to disasters and the reduced capacity to respond effectively.

In **Galați County**, there is a marked demographic trend of accelerated aging and rural depopulation. In many communes, young people have migrated to urban areas or abroad, leaving behind households composed mainly of elderly individuals with limited mobility and income. Unemployment rates are high in disadvantaged areas, and access

to public services is limited. This social context significantly reduces the capacity for self-help and community solidarity in emergencies.

Cahul District is one of the poorest regions in the Republic of Moldova. Over 60% of the population lives in rural areas, with limited access to education, healthcare, and economic opportunities. External migration is high, leading to a reduced active labor force and a heavy reliance on remittances. In many localities, the poverty rate exceeds 40%, and a significant portion of the active population engages in subsistence agriculture, making them extremely vulnerable to disaster-related losses.

In the **rural areas of Varna**, there is a stark contrast between urban development and rural isolation. Villages near industrial zones or the coastline attract seasonal workers but remain exposed to social vulnerabilities such as limited access to public transportation, poor healthcare services, and unstable incomes. The elderly population is predominant, and modest pensions do not provide sufficient resources to invest in safe housing or recover lost assets after a disaster.

Rural communities in Imereti are often isolated, located in mountainous areas or along riverbanks. Access to education and healthcare is limited, and the social infrastructure is underdeveloped. Many residents rely on subsistence farming or informal trade. Moreover, in some localities—especially those affected by migration—households are composed of children and elderly people, which greatly complicates crisis management.

4.2 Access to services and critical infrastructure

Rapid access to critical infrastructure (transport, water, energy, healthcare, education) is essential during a disaster. Its absence significantly increases the risk of isolation, delays emergency response, and can amplify losses.

In many villages in **Galați County**, access roads are gravel-based and become impassable during rain or snow. Access to potable water and sewage networks is limited in rural areas. Some localities have no permanent family doctor, and the nearest medical facility is more than 15 km away. Power grids are vulnerable to wind and freezing conditions and are frequently damaged during storms.

Only a portion of rural localities in **Cahul** are connected to centralized water and sewage systems. Many households rely on wells or unprotected alternative sources, which become unusable during floods. Public transportation is limited, and ambulances or fire-fighting equipment struggle to reach isolated villages. In some cases, residents lack access to mobile phone service or the internet, limiting the dissemination of emergency information.

In the **rural areas of Varna**, critical infrastructure is affected by landslides and soil erosion. Power lines and roads are frequently damaged, and sewage systems are nonexistent in smaller villages. Access to medical facilities is poor, and in some settlements, schools have been closed, reducing their potential use as emergency shelters.

In **Imereti**, difficult access, narrow or unpaved roads, and the absence of public transport significantly limit mobility in the event of a disaster. In mountainous areas, bridges and forest roads are often damaged by rain or landslides. Electricity supply is unstable, and water systems are vulnerable to clogging and contamination. Regional hospitals are overburdened, and first aid centers in isolated villages are underfunded.

4.3 Specific geographical and climatic conditions

The geography and climate of the analyzed regions directly influence the type and severity of disasters.

- **Galați** is located between two major rivers (the Prut and the Siret) and is characterized by low plains, making it prone to **flooding, drought, and blizzards**.
- **Cahul** has a varied relief, with low-lying areas exposed to **Prut River overflows**, as well as moderate slopes vulnerable to **erosion**. The **semi-arid climate** favors drought conditions.
- **Varna** is situated in a coastal zone, affected by the influence of the **Black Sea**, **strong air currents**, and **geomorphological instability** (slippery and unstable terrain).
- **Imereti** features **mountainous geography**, with fast-flowing rivers and unstable slopes, making it highly susceptible to **landslides, ash floods, and severe winds**.

4.4 Vulnerable groups and marginalized communities

Vulnerable groups include the elderly, children, persons with disabilities, single mothers with children, ethnic minorities, and individuals with very low incomes. These groups are the most affected during emergencies, as they have **limited access to information, reduced mobility, and low recovery capacity.**

Across all regions:

- **Elderly individuals** often live alone, without nearby support;
- **Children** are exposed to both physical and psychological risks during disasters, especially when schools do not serve as safe shelters;
- **Persons with disabilities** lack adapted infrastructure for evacuation or access to shelters;
- **Isolated communities** (e.g., some Roma villages or ethnic minorities in Varna and Imereti) are not integrated into early warning and support systems.

These realities call for **local policies that are sensitive to vulnerability, support for mobility and personalized access to information, and training of local volunteers** to provide targeted assistance during crises.

5. Assessment of Local Resources and Capacities

This section analyzes the capacity of rural communities to prevent, respond to, and recover from disasters. The assessment focuses on emergency infrastructure, administrative structures, community involvement, and institutional vulnerabilities that influence the effectiveness of local response. It is essential to understand that risk is determined not only by the frequency of disasters but also by the level of preparedness and response capacity.

5.1 Emergency infrastructure and response capacity

The Galați Emergency Situations Inspectorate (ISU) coordinates response activities, but many rural localities lack their own intervention points. Most communes do not have modern equipment (such as fire engines, generators, or water pumps), and response time depends on the distance from urban units. Acoustic alarm systems are outdated or entirely absent, and communications are often disrupted during severe weather. Despite investments through European funds, significant disparities remain between rural and urban areas in terms of intervention capacity.

In Cahul, the Civil Protection and Emergency Situations Service (SPCSE) operates at the district level, with qualified but understaffed personnel, given the number and dispersion of settlements. Volunteer firefighters are almost entirely absent in villages, and intervention equipment is scarce. In cases of fire or flooding, residents often have to wait 30 to 60 minutes for response teams to arrive. Civil protection shelters are either non-functional or poorly marked, and schools and town halls have not been adapted for emergency use.

Authorities in Varna have implemented a municipal civil protection plan and conducted a risk analysis. However, emergency infrastructure is concentrated in the city, while first aid and fire posts in rural areas are poorly equipped. Automated detection systems for fires and floods are not installed in all localities. Official reports emphasize the need for digitizing emergency response, integrating real-time monitoring systems, and training personnel at the local level.

In Imereti, response capacity is hindered by long distances, challenging terrain, and the limited resources of intervention teams. The regional crisis management center is operational but underfunded. In the case of major disasters, intervention depends on support from national authorities. Some localities have first-aid points, but they are not connected to an efficient logistics system. In many cases, communities must rely on informal capacities—mutual aid, ad-hoc volunteerism, and support from local NGOs.

5.2 The role of local authorities and relevant institutions

In all four regions, **local authorities play a crucial role in organizing emergency response**, but their **administrative capacities are limited**.

- **Rural municipalities are poorly staffed** with civil protection specialists.
- Emergency response officers are often general civil servants **without specific training**.
- **Institutional collaboration is mostly formal**, lacking joint exercises, simulations, or coordinated intervention scenarios.

However, in some regions (e.g., **Galați** or **Varna**), progress has been made in integrating **risk plans into local development strategies**. In **Georgia** and **Moldova**, decentralization is still underway, and small municipalities **lack real financial autonomy** to invest in prevention measures.

5.3 Contribution of community organizations and volunteers

Community involvement is essential during the phases of prevention, response, and recovery. Unfortunately, in the analyzed regions:

- The level of **volunteer organization is very low**;
- **NGOs active in risk management are few and poorly funded**;
- **Civic education on risks is insufficient**, especially among young people and vulnerable groups.

Notable exceptions are found in **Georgia**, where **UNDP and Red Cross projects** have supported the creation of **community-based rapid response teams** in isolated villages, and in **Bulgaria**, where **disaster education classes** have been introduced in schools. In **Romania** and **Moldova**, emergency volunteering remains **poorly regulated**, and public involvement is **spontaneous rather than institutionalized**.

5.4 Identified gaps and needs in risk management

Based on the assessment of resources and capacities, several key gaps and priority needs have been identified:

- **Lack of local emergency infrastructure** (fire engines, coordination centers, functional shelters);
- **Insufficient trained personnel** and lack of regular training for public officials;
- **Poor communication** between authorities and the population during crisis events;
- **Outdated or incomplete emergency plans** that do not reflect current risk scenarios;
- **Exclusion of vulnerable groups** from protection strategies;
- **Chronic underfunding** of local emergency services and lack of investment in prevention.

Strengthening local capacities involves more than just technical equipment—it requires the development of a **culture of prevention**, the promotion of **inter-institutional collaboration**, and the **genuine participation of citizens** in decision-making processes related to community safety.

6. National Assessments – Country Case Studies

6.1 Bulgaria – Varna Region

General context

The Varna region is one of the most economically, touristically, and demographically developed areas in Bulgaria. Located on the western coast of the Black Sea, it includes major cities such as **Varna, Devnya, and Provadia**, as well as a significant number of rural settlements. While the urban area benefits from relatively modern infrastructure, **rural regions remain vulnerable to both natural and technological risks**. The rural population is affected by **aging, poverty, and migration**, and **access to emergency services is limited** in some isolated localities.

Landslides are classified as causing the greatest risk for the disaster situation in the Varna region. Residents in the Devnya area indicate chemical accidents and

epidemics as the greatest danger, and in the Provadia and Dalgopol regions – the floods. The analysis of the official documents and the statements of the specialists from the Civil Protection Department at the Ministry of Interior and the Geological Protection Directorate at the Ministry of regional development and public works show that landslides are the primary hazards in terms of frequency for residents in the Varna region. Landslide processes are not treated as sudden and can be regulated by technical means of solutions. Over time, there are periods of their subsidence and activation. After the activation of a landslide, a disaster situation may occur in a certain area.

According to data from the Geological Protection departments as of 31.12.2019 a total number of 2180 landslides were registered on the territory of Bulgaria. 847 out of them are active, 1026 are potentially active and 307 are stabilized. Landslide processes are not evenly distributed throughout the country. They are concentrated in specific areas characterized by geological and tectonic structures. In the areas along the Black Sea coast, 299 landslides were registered (14% of the total number of landslides in the country). A significant part of them are periodically activated due to both natural influence and human interventions.

The highest percentage of the active landslides is in the region of Varna – 46 times of occurrence or 67% of all active landslides along the Black Sea coast. The number of stabilized landslides along the coast is 88 (29% of all stabilized landslides in the country). 98 landslide areas have been registered on the territory of Varna municipality. Most of them are stable, but in certain circumstances they become creeping ones. Statistics show an increase in the number of landslides over the last decade, which have negative impacts for the population, infrastructure and economy of the country. For this reason it is imperative to carry out coastal protection and preventive activities to limit landslide processes.

Floods, earthquakes and fires are listed as the second most frequent disasters.

In recent years, floods have mainly occurred during torrential rains. Flash floods are particularly dangerous for the towns and areas where impermeable street and sidewalk surfaces create conditions for the formation of flows with high water speeds, rapid concentration and almost no losses from infiltration into the soil. A similar effect occurs in valleys with large slopes, where the rapid concentration of runoff can generate catastrophic water flows with little durability. Often, flows from intense rains are directed onto the streets, overflowing the surface water sewers and the water rises above the curbs. This leads to: ground floors are flooded, water invades basements, basements, underground garages and other premises below the level of the street lanes.

Violent water flows destroy road and sidewalks, lift and carry away asphalt and sidewalk surfaces, extract earth masses and additionally clog the water sewage network with mud, silt and other waste. The canals are silted up and the culverts are blocked, which makes it difficult to drain the water and it goes out of the riverbeds, flooding the low-lying areas of the towns.

This is a disaster which the municipalities should cope with.

The territory of Bulgaria is characterized as high seismic and is among the "secondary earthquake" hazard areas on Earth. The territory falls under the influence of both internal and external seismogenic regions with an expected magnitude up to 8 (Richter scale) and an intensity of IX and higher (Medvedev-Sponhoer-Karnik scale). Three internal seismic regions are defined on the territory of the country: Northeastern, Central Mountain and Rila-Rhodope (South West) region.

Industrial incidents

One of the villages in Aksakovo municipality is located near Devnya municipality, where the chemical industry is predominantly developed and this factor poses a danger to the life and health of people. There, chlorine is produced and stored about 500 tons, ammonia from 150 to 500 tons, nitric acid about 1000 tons, ammonium nitrate - 40,000 tons and other dangerous chemical substances. Regardless of preventive measures, in case of gross violation of the technology system (in cases of earthquakes, fires, etc.) a severe industrial incidents may happen. As a result, a pollution with industrial, highly toxic substances of workers and employees of these sites and the population of nearby settlements may occur.

Risk analysis in case of disasters

In the last years the municipalities performed risk analysis and assessment in cases of disasters which determine the nature and extent of risk as a function of hazard, vulnerability and probability. The analysis result were set in the Municipal Plans for Disaster Protection.

The risk assessment is part of the risk process and includes specific steps:

- identification and initial description of the risk
- analysis and assessment of the risk

The table below summarizes the risk analysis and assessment in case of disasters in Varna and the region

Table 1. Risk assessment

No	Identification of hazards	Risk analysis			Risk assessment											Total
		Likelihood	Impact	Level of risk	Significance				Manageability				Increasingness			
					Social (C)	Impact on infrastructure (N)	Economic (3)	Impact on environment (O)	Result	Prevention	Preparedness	Reaction	Recovery	Arithmetic average	Assessment of level	
1	Surface floods	Likely	moderate	low	3	3	2	2	2,75	3	2	3	3	2,75	1	9,00
2	Severe storms, squalls	Likely	minor	low	1	1	1	1	1,00	4	3	3	2	3,00	2	7,00
3	Snow drifts, low temperature, ice floes	Likely	low	low	2	1	1	1	1,50	2	2	1	1	1,50	1	5,50
4	Earthquakes	possible	catastrophic	low	5	5	4	3	4,65	2	3	3	3	2,75	1	13,5
5	Landslides	Likely	low	low	2	3	1	1	2,00	2	2	1	2	1,75	2	7,75

6	Increased radiation level	possible	Moderate	low	3	1	1	1	2,00	2	3	1	1	1,75	1	6,75
7	Forest and urban fires	possible	Moderate	low	3	2	1	2	2,35	2	1	1	3	1,75	2	9,25
8	Spill of hazardous substances	Likely	low	low	2	1	1	1	1,50	2	2	1	2	1,75	2	6,75
9	Animal epidemic	Very rare	low	low	2	1	2	1	1,65	1	1	2	2	1,50	1	5,80
10	Human epidemic	Very rare	Moderate	low	3	1	1	1	2,00	1	1	1	2	1,25	1	6,25
	Major transport accidents															
11	Road transport	Likely	low	medium	2	2	1	1	1,75	2	2	1	2	1,75	2	7,25
	Air transport	unlikely	moderate	low	3	3	1	1	1,25	1	1	1	2	1,25	1	7,25
	Railway transport	possible	moderate	low	3	3	1	1	1,75	2	2	1	2	1,75	1	7,25
	Water transport	possible	Moderate	low	3	1	1	1	2,00	1	2	1	2	2,00	1	7,00

Table 2 shows the risks and areas of harmful impacts:

Risk	Areas of harmful impacts			
Hazards	Social impacts (S)	Impacts on infrastructure (I)	Economic losses (L)	Impact on environment (E)
Surface floods	*	*	*	*
Severe storms, squalls	*	*	*	
Snow drifts, low temperatures, ice floes		*	*	
Earthquakes	*	*	*	*
Landslides		*	*	*
Increased radiation level			*	*
Forest and urban fires			*	*
Spill of hazardous substances			*	*
Animal epidemic	*		*	
Human epidemic	*		*	
Major transport accidents				
Air transport	*	*	*	*
Railway transport	*		*	*
Water transport	*	*	*	*
Air transport	*		*	*

The identification of the disaster risks is followed by the risk analysis. Risk analysis is made to divide the “acceptable” risks from the “significant” risks. It considers the likelihood and impacts of each type of risk. The analysis also considers the sources of risks, the impacts and the likelihood those impact may occur.

Table 3. Criteria of impacts

Level	Description	Detailed description
1	Unlikely	No injuries, little or no damage, minor financial losses
2	Low	Need for first aid, minor damage to buildings, moderate financial losses.
3	Medium	Need for medical treatment of injured, moderate damage to buildings and infrastructure, high financial losses.
4	Large	Significant injuries, high level of damage to buildings and infrastructure, large financial losses.
5	Catastrophic	Deaths, most buildings and infrastructure severely damaged, huge financial losses

The factors that influence the impacts and likelihood are identified. The existing risk control is analyzed and the assessment of impacts and likelihood are combined.

Risk analysis can be qualitative, semi-quantitative, quantitative or complex depending on the circumstances. Qualitative analysis is most often used to obtain a general idea of the level of risk. At a later stage, a more detailed quantitative risk analysis can be carried out if necessary.

Table 4 presents the criteria for likelihood.

A risk analysis matrix was used to present the qualitative risk assessment, determined by the two factors: likelihood and impacts.

Level	Description	Detailed description	Indicative average recurrence period	Indicative frequency
A	Very likely	It is expected to occur in most cases. (Many documented events and evidence)	≤ 1 year	Once or more times a year
B	Likely	Likely to occur in most cases. (Many documented events. Events that have occurred in the recent years in other comparable areas/municipalities/territories. High possibility, cause or condition for occurrence)	≤ 10 years	Once or more times in 10 years
C	Possible	May occur at any time (Small number of documented events. Recent events occurred in other comparable areas/municipalities/territories. Small possibility, cause or conditions for occurrence)	≤ 100 years	Once or more times in 100 years
D	Unlikely	It may occur at some moment. Very few documented events or evidence, a few recent events in other comparable areas, municipalities, territories. Very little possibility, cause, or conditions for occurrence.	≤ 1000 years	Once or more times in 1000 years
E	Very unlikely	May happen only in exceptional circumstances. No documented events or other evidence No events have occurred in other comparable areas, municipalities, etc. Extremely small possibility, cause or conditions for occurrence.	> 1000 years	Less than once in 1000 years

Through the risk analysis matrix, the identified risks are classified into four levels: Extreme, High, Moderate and Low.

- Extreme level of risk - these are critical risks that require special attention and high priority measures.
- High level of risk - these are significant risks, with a sufficiently large potential for harmful impacts, for which priority measures must also be taken.
- Moderate risk level - these are less significant risks. This means that they should be monitored to ensure that appropriate measures are taken.
- Low level of risk - dealing with these risks may be subject to planning by individual competent authorities

Table 5 presents the quality matrix for risk analysis

Likelihood	Impacts				
	1 Unlikely	2 Low	3 Moderate	4 High	5 Catastrophic
A – Very likely	Moderate	Moderate	High	Extreme	Extreme
B - Likely	Low	Moderate	High	High	Extreme
C - Possible	Low	Moderate	Moderate	High	High
D - Unlikely	Low	Low	Moderate	Moderate	Moderate
E – Very rare	Low	Low	Low	Moderate	Moderate

Table 6 shows qualitative risk analysis and classification

Source of risk	Criteria of likelihood	Criteria of impacts	Qualitative risk assessment
Surface floods	D - Unlikely	3 – Moderate	Moderate
Severe storms, squalls	B - Likely	1 – Low	High

Snow drifts, low temperatures, ice floes	B - Likely	2 - Moderate	High
Earthquakes	C - Possible	5 - High	Low
Landslides	B - Likely	2 - Moderate	Low
Increased radiation level	C - Possible	2 - Moderate	Moderate
Forest and urban fires	C - Possible	3 - Moderate	Moderate
Spill of hazardous substances	B - Likely	1 - Low	Moderate
Animal epidemic	E - Very rare	1 - Low	Moderate
Human epidemic	E - Very rare	1 - Low	Moderate
Major transport accidents			
Air transport	B - Likely	2 - Moderate	High
Railway transport	D - Unlikely	3 - Moderate	Moderate
Water transport	C - Possible	3 - Moderate	High
Air transport	C - Possible	3 - Moderate	Moderate

Table 7 presents the numerical values for the hazards identified in the territories during the risk assessment according to the criteria "Seriousness", "Manageability" and "Increasingness"

No	Hazards	Total risk assessment
1	Surface floods	9,25
2	Severe storms, squalls	7,00
3	Snow drifts, low temperatures, ice floes	5,50
4	Earthquakes	13,50
5	Landslides	7,75
6	Increased radiation level	6,75
7	Forest and urban fires	9,25
8	Spill of hazardous substances	6,75
9	Animal epidemic	5,80

10	Human epidemic	6,25
11	Major transport accidents	
	Air transport	7,25
	Railway transport	7,25
	Water transport	7,25
	Air transport	7,00

Analysis results of hazards

1. The main form of protection against disasters, accidents and catastrophes is undertaking preventive actions to prevent them and reduce their harmful impacts. Preventive actions consists of: research, analysis, assessment and forecasting of disaster risks; planning of disaster protection; implementation of preventive measures to reduce the impacts of disasters, such as technical measures, maintaining the notification system, providing individual and collective means of protection; training of the management staff of the municipality and the population and conducting a preventive control.
2. Particular attention should be paid to the training of persons directly involved in the announcement and management of activities in the event of disasters. A special register should be developed for the available resources in the municipality which can be involved to prevent, limit the harmful impacts and their elimination in disasters.
3. Continuous training of existing volunteer formations and establishment and training of others is necessary.
4. The municipal budgets foresee resources to ensure the activities set in the Plan for disaster protection, dispersal and evacuation, as well as reserves for urgent and unforeseen expenses related to the protection of the population.
5. It is necessary to create an organization and secure financial and human resources for the evacuation and dispersal of the population, animals, cultural and material objects threatened by disasters, accidents, terrorist acts or other dangers; prevention activities include protection against disasters, accidents and catastrophes to reduce the harmful impacts.

Main/secondary support functions in case of disasters

- The Council of Ministers performs the state policy for protection of disasters. It adopts a National Strategy for reducing the risks of disasters; a National Programme and Annual Action plans for reducing the risk of disaster; a National Plan for Disaster Protection. Sets up a National system for early warning of disasters oriented to the municipalities and population. The Ministerial Council is planning financial sources for protection of disasters.

A Committee for reducing the risks of disasters is set within the Council of Ministers which is composed by ministries' managerial staff; research and academic institutes; the National Association of municipalities in Bulgaria, The Bulgarian Red Cross and related NGOs.

As for the realization of the National Plan for Disaster Protection, the Ministerial Council sets a National Committee (Headquarters) consisting of ministers, deputy ministers, head of units, deputies, etc. For the support of the Headquarters activities, working expert groups are created. Their staff is preliminary set and included in respective units, part of the National system for early warning of disasters.

The Minister of Interior is the chairperson of and represents the Committee for reducing the risks of disasters. A National coordination group is created within this Committee consisting of ministries' representatives, specialized institutions, the Bulgarian Academy of Science, higher education, scientific institutions, etc.

- The regional governors organize and manage the protection of disasters in the region they operate; organize trainings of the staff on ways of behavior and actions part of the regional plan for disaster protection. They also coordinate and control the preparatory activities by the administration and the territorial departments of the ministries during disasters.

A Regional Council for reducing the risk from disasters is established within the Regional Government office chaired by the governor. The members of the Council are: the mayors or their substitutes, one representative from the respective municipal councils, directors of the respective responsible institutions, NGOs, etc.

- The mayors of the municipalities organize and lead the actions for protection of disasters; carry out preventive measures for mitigating the impacts; organize the early warning of disasters; establish by order a Municipal Committee (headquarters) for

realization of the municipal plan for disaster protection and cooperation with the rest municipal/regional/ national headquarter; monitors the implementation of the municipal plan for protection of disasters and program for mitigating the risks of disasters. The mayors are responsible for provision of trainings to the municipal staff and the local population, actions to increase the preparedness and actions during disasters and preventive measures.

The Municipal Headquarters carry out analysis and assessment of the local situation in case of disasters; propose solutions and the necessary resource for protection and limitation of the impacts of disaster. They are also responsible to inform the population through the media.

There are Municipal Committees for limitation the risks of disasters established within the municipalities chaired and represented by the mayors. The members of these committees are the deputy mayors, the chief architects, representatives of the municipal councils, the respective institutions, NGOs, etc.

Cooperation with similar bodies/organizations in case of disaster at local/regional/national level

When an emergency is announced, the Disaster Protection Plan is taken into action. The Municipal Headquarters members are gathered and the mayor assigns tasks to responsible persons and define the relevant sections: for collecting information and planning the necessary activities, for organizing interactions with the respective units of Unified Rescue System (URS), for connection with the media and preparation of public information.

Executive authorities and the legal entities organize disaster protection following the provisions of the Disaster Prevention and Mitigation Act and other regulatory acts regulating their activities. The actions of the authorities and individuals are coordinated in a unified rescue system for disaster protection.

The unified rescue system includes units of ministries and departments, municipalities, commercial companies and private entities; emergency medical care centers, other medical and health institutions, non-profit legal entities, including voluntary formations and the army. The main units of the unified rescue system are the General Directorate "Fire Safety and Population Protection" at the Ministry of Interior, the regional directorates of the Ministry of Interior, the Bulgarian Red Cross and the emergency medical care centers. The interaction and coordination between the units are carried out by their heads.

Participation to training/training programs on disaster management

There are regular trainings provided for the responsible executive bodies, other state bodies and the population. The training of the executive bodies is a mandatory activity. The municipalities organize trainings for their employees, sub-executive units, service departments and other operational structures for the protection activities. Training in disaster protection and first aid is carried out also in schools and higher education institutions following the educational curriculum established by the Ministry of Education and the Ministry of Interior.

Trainings to the population are related to ways of behavior and actions on the necessary preventive measures in disasters and organized by the mayors of the municipalities.

Participation to disaster intervention actions

Trainings on preparedness are provided on regular basis for the municipal staff, the responsible bodies and for the population. The organization of these trainings is supervised by the regional governor, the mayors and the members of the regional and municipal committees for disaster prevention. Such trainings include:

- simulating and playing out crisis situations related to natural and man-made disasters
- exercises in companies and facilities located on the territory of the region

Population takes part in trainings on a voluntary basis. The training activities include in lectures at the workplace, communication through the local media and practical exercises for disaster response.

There is a Center for Specialization and Professional Training in Fire Safety and Rescue established in the city of Varna, which is part of the Academy of the Ministry of Internal Affairs. The main activities of the center are to professionally prepare the executive staff of the responsible institutions and bodies. On annual basis practical trainings and exercises are organized for primary and secondary schools and kindergartens as well.

6.2 Republic of Moldova – Cahul District

General context

Cahul District is located in the southwestern part of the Republic of Moldova, on the border with Romania, and is one of the largest and most populous administrative-territorial units in the country. The district is crossed by the Prut River and features a landscape of hills and low plains. The area is predominantly rural, with an economy focused on **agriculture**, an activity often impacted by **droughts, floods, or hailstorms**. The level of **social and economic infrastructure** is modest, and the **resources of local public authorities are limited**.

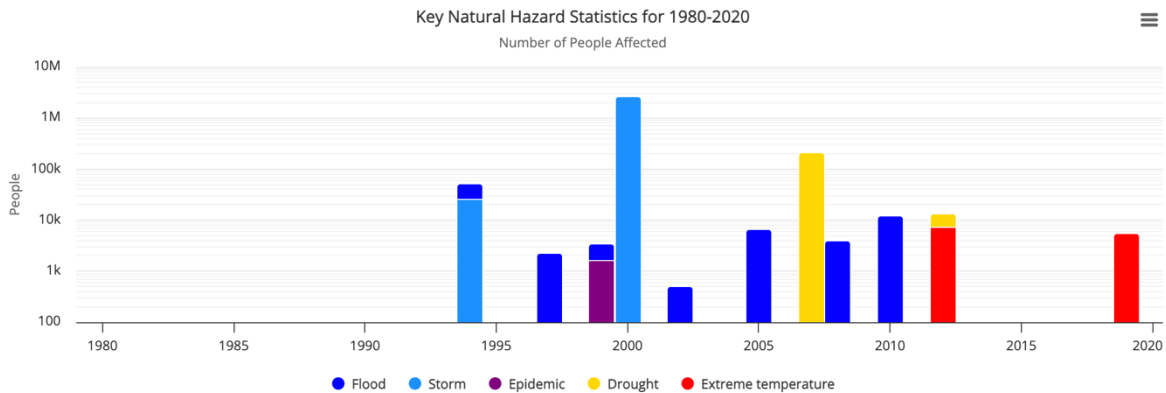
The Cahul region in Moldova is susceptible to various natural hazards, including droughts, torrential rains, hailstorms, and floods. Between 2010 and 2020, the area experienced 50 instances of torrential rains, 49 hail events, and 41 droughts. Financially, frost caused the most significant damage (94.9 million Moldovan lei), followed by torrential rains (78.3 million lei) and droughts (70 million lei).

Flooding is a notable concern in the region. In 2008, the Prut River's water levels rose by approximately 30 cm per day, leading to the evacuation of residents and damage to properties in the Cahul district.

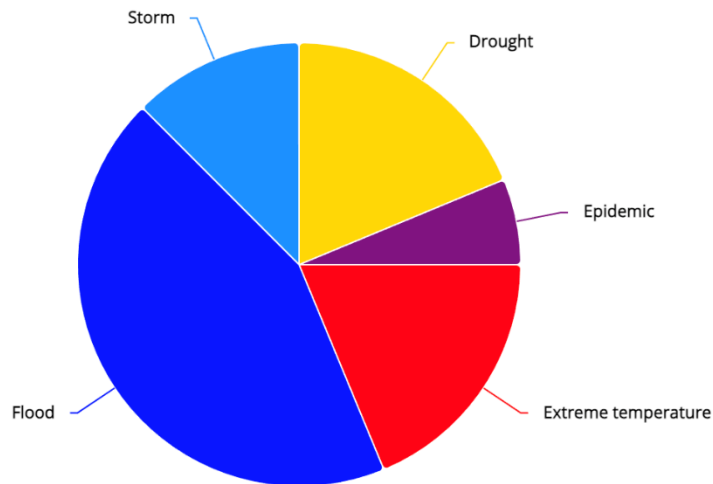
Regarding man-made disasters, one specific incident in the Cahul area was the fire at the Giurgiulești port on January 16, 2023. Although the oil terminal was not affected and only the wheat silo was ablaze, there remains a constant risk of a much larger disaster with severe consequences for both public safety and the environment. Moldova's vulnerability to such events has been assessed more in detail. A study by the Moldova Red Cross Society and the Department of Civil Protection and Emergency Situations evaluated the prevalence of earthquakes, floods, landslides, and man-made disasters across various municipalities.

Additionally, the World Bank's Climate Change Knowledge Portal provides an overview of Moldova's susceptibility to natural hazards, including droughts, late spring frosts, hail, floods, and severe storms.

The charts below show the most prevalent natural hazard in the 1980-2020 period:



Average Annual Natural Hazard Occurrence for 1980-2020



Source

https://climateknowledgeportal.worldbank.org/country/moldova/vulnerability?utm_source=chatgpt.com

These resources collectively highlight the natural and potential man-made disaster risks in the Cahul area, emphasizing the importance of proactive disaster risk management and climate resilience strategies.

RISK ANALYSES IN CASE OF DISASTERS

There are permanent analyses on occurring natural disasters in Cahul area performed by the Cahul Department for Emergency situations. They are centralized in

various reports at national level by the General Inspectorate for Emergency Situations. An example of such documents summarizing the prevalence of the natural and man-made risks is the Analysis of Exceptional Situations 2010 – 2024.

(https://dse.md/sites/default/files/statistic_documents/Analiza%20SE%202010-2024.pdf)

But Moldova lacks a National Risk Assessment, and the current legislation does not regulate its process. This issue was raised by various institutions, such as the World Bank's policy note which emphasizes the need for comprehensive risk assessments and the development of methodologies to track and incentivize disaster risk reduction (DRR) and disaster risk management (DRM) budget allocations across both national and local levels (Source: documents1.worldbank.org).

In 2019, International Standards on the risk assessment process (International Organisation for Standardisation 31000) were adopted but they are not mandatory. A document providing recommendations on risk assessment methodology is available for the local level. (https://civil-protection-knowledge-network.europa.eu/system/files/2024-07/peer-review_md-report.pdf)

ROLES OF LOCAL PUBLIC AUTHORITIES IN DISASTER SITUATIONS

Moldova's legislative framework outlines the responsibilities of local public authorities in disaster scenarios. Key legal acts include:

- **Law 271 on Civil Protection (1994):** Defines the fundamental principles of civil protection organization at all levels and establishes the tasks and legal framework for public authorities, institutions, enterprises, organizations, and citizens (Source: undp.org).
- **Law 93 on Civil Protection and Emergency Situations Service (2007):** Establishes the legal framework, principles of activity, powers, duties, and rights of the Civil Protection and Emergency Situations Service staff, and the conditions necessary to perform the service and activities in its subdivisions (Source: undp.org).

Under these laws, local governments are responsible for managing activities to support people in need during emergencies, operating under the overall coordination of the national emergency management system (Source: civil-protection-knowledge-network.europa.eu).

COOPERATION WITH SIMILAR BODIES/ORGANIZATIONS IN CASE OF A DISASTER

Local authorities in Moldova collaborate with various organizations to enhance disaster response capabilities. The General Inspectorate for Emergency Situations plays an essential role in disaster management, collaborating with government institutions such as and local public authorities. They constitute the disaster management commissions at both national and regional levels

Additionally, initiatives like the **SMURD-2 project** have strengthened cross-border emergency response, exemplified by the construction of landing platforms in Moldova and the establishment of joint emergency response plans (Source: euneighbourseast.eu).

Participation in Training Programs on Disaster Management

Local authorities in some areas have actively participated in training programs to enhance disaster management competencies. For instance, in January 2024, training sessions were organized to develop disaster risk reduction (DRR) strategies for municipalities in the Anenii Noi region. These sessions aimed to establish a common understanding of key DRR concepts among local authorities (Source: acted.org). However, at the national level, much remains to be done, as beyond basic training for local public authorities, significant additional efforts are required to prepare the population for effective disaster management.

6.3 Georgia Imereti Region

General context

The Imereti region is located in western Georgia and includes 11 municipalities, including Kutaisi, Zestafoni, Tskaltubo, Vani, and Bagdati. It is a predominantly mountainous region, characterized by **deep valleys, unstable slopes, and a rich hydrographic network**. These geographical features make it prone to **multiple natural hazards**. The rural population is often **isolated, with limited access to public services**, and the local economy is dominated by **subsistence farming and informal activities**. Although the **physical and institutional infrastructure** is undergoing improvements, it remains **underdeveloped in many localities**.

Georgia is among the most difficult mountainous regions in the world in terms of the scale of the development of natural geological processes, the vulnerability of the territory, and the risk of danger to the population and infrastructure facilities, with 70% of its area and up to 60% of its settlements being at risk of various categories of danger. Due to its location in a seismically active zone, this poses threats from natural disasters such as earthquakes, floods, avalanches, landslides, mudslides, forest fires, drought, hail, and erosive processes. These natural disasters can cause severe damage to the local population. It is worth noting that climate change and anthropogenic impact on the environment are additional factors leading to an aggravation of natural processes and, as a consequence, the increase in the damage caused by them. **In recent decades, a trend of increasing the frequency and intensity of these events has been clearly observed on the territory of Georgia, which, along with economic losses, is often accompanied by human casualties**. In recent years, landslide processes have significantly increased. Precipitation is one of the main factors and, in many cases, the dominant provoking factor in terms of its origin and activation.

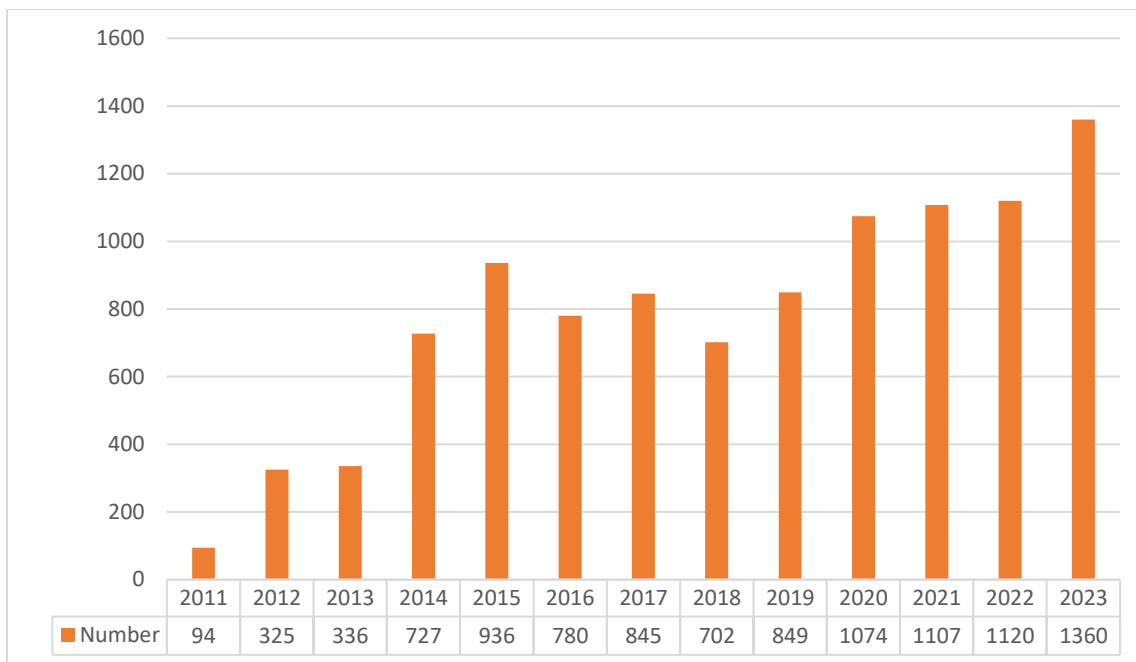


Fig. 1. Landslide processes recorded on the territory of Georgia in 2011-2023

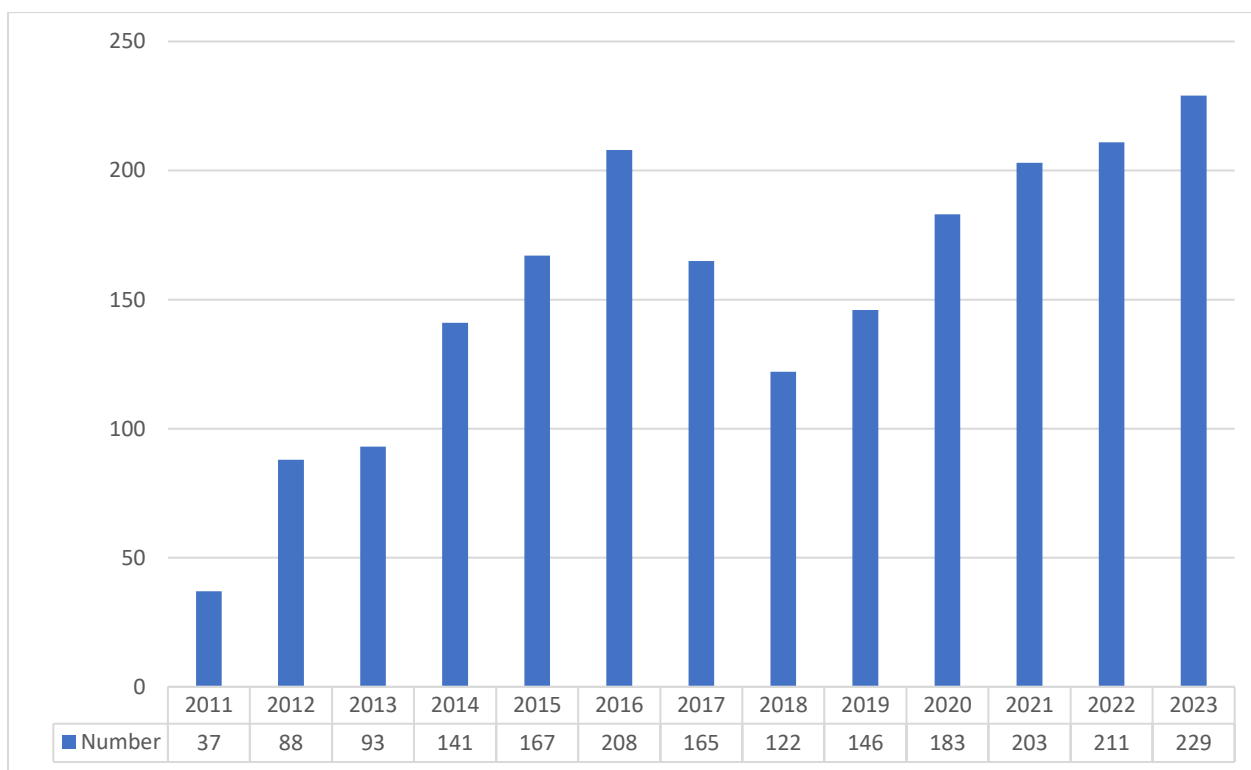


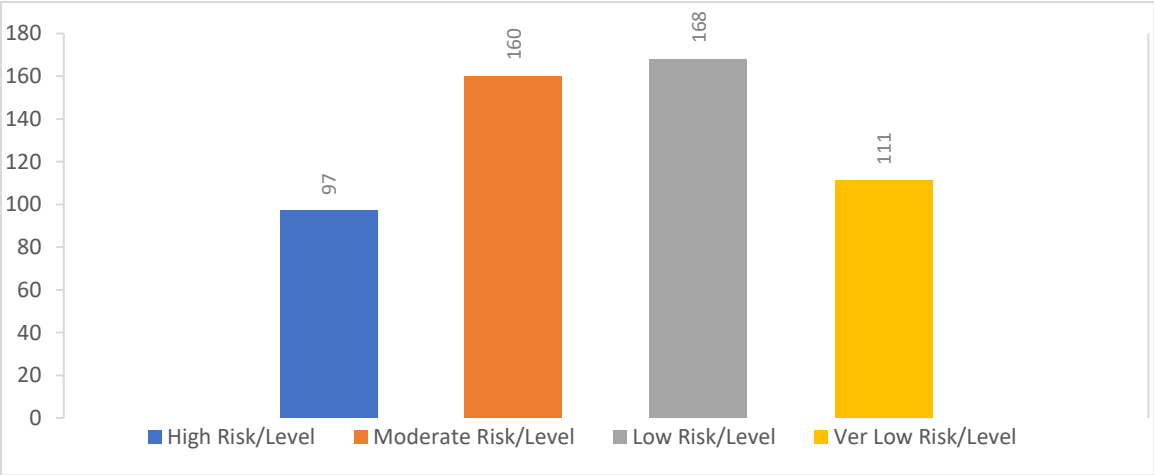
Fig.2. Mudslide processes recorded on the territory of Georgia in 2011-2023

Studies conducted in 2023 revealed that the trend of activation of natural geological processes in Western Georgia greatly exceeded the background levels. Considering the complexity of natural factors and the scale of the development in a short

time, the Shovi natural disaster of August 3, 2023 (Racha-Lechkhumi-Lower Svaneti region) is a rare type of disaster, during which the coincidence of hydrometeorological and geological events in the gorge of the Bubistskali River led to the initiation and activation of a catastrophic process, which in turn caused human casualties (33 people) and tens of millions of GEL in damage. A process of a similar scale and complexity had not occurred in the gorge of the Bubistskali River for at least the last two centuries.

Dangerous geological processes are common in the Imereti region. These include: landslides, floods, hurricane winds, rock avalanches, rockfalls, karsts, erosion, and, rarely, mudslides. The most common of these are landslides, which, when favorable natural conditions occur, become more active and can pose a serious threat to both settlements and agricultural and engineering facilities.

There are 546 settlements in 11 municipalities in the Imereti region. In terms of geodynamic processes, according to landslide damage, four categories of settlements have been distinguished: high, medium, low, and very low. 97 settlements are in the high hazard risk zone, 170 in the medium hazard risk zone, 168 in the low hazard risk zone, and 111 in the very low hazard risk zone.



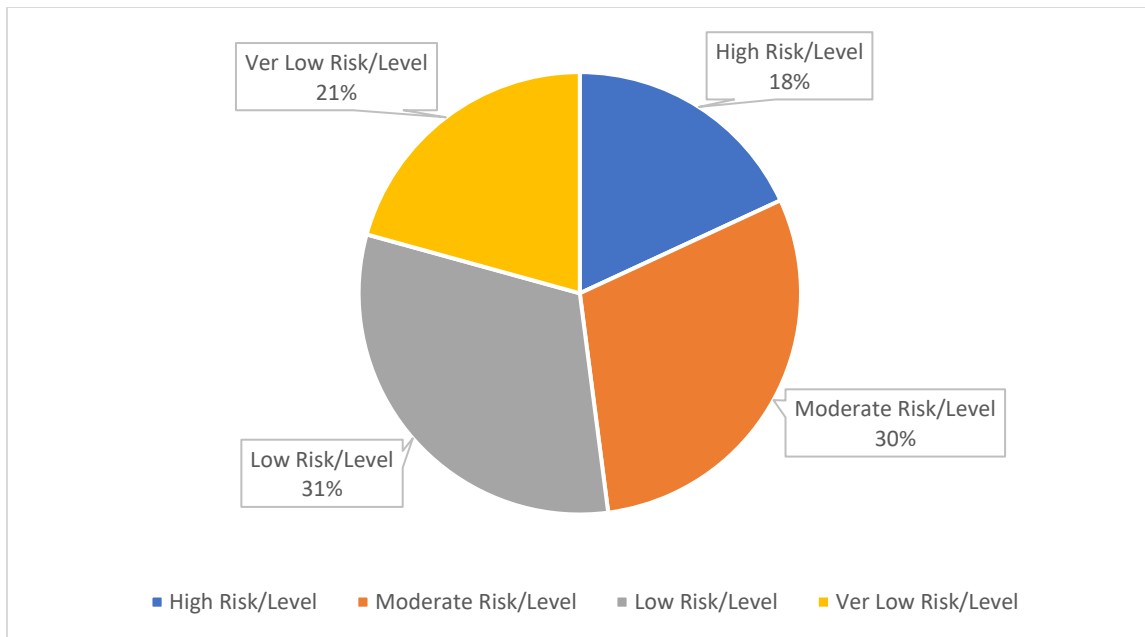


Fig.3. Number of settlements under threat from geological processes in the Imereti region

An increase in the intensity of atmospheric precipitation on the territory of Imereti is associated with flooding, river floods, and mudflows (especially in the Rioni River basin and its small tributaries). These events pose a danger to both human settlements and roads linking them to other settlements. Along with daily precipitation maxima, a special synoptic phenomenon is the continuous duration of heavy rainfall. Floods are often associated with this phenomenon in the region (e.g., the village of Zhoneti, Tskaltubo municipality), and river floods are associated with short periods of heavy rainfall. Rivers flowing from a large number of atmospheric rainfalls from mountainous regions are fed by the melting snow and are characterized by rapid currents. Water levels are particularly high during spring, with snow melting. Such rivers typically feature one peak of flooding.

Since 2004, floods have been occurring almost every year in the Imereti region, causing significant material damage. Also noteworthy is the flooding caused by the floods in October 2017 as a result of which the municipalities suffered heavy damage, paralyzed travel, and damaged streets and houses. According to statistics, as a result of heavy rains and heavy melting of snow in 2005, floods were recorded in Tskaltubo and Vani municipalities (Rioni river basin). In Kutaisi, 3 houses broke into the shore and flooded 30 coastal houses, destroyed two, and damaged 9 houses in Opurchkheti. 66 houses were flooded in Tskaltubo and 6 houses were flooded in Vani and 20 were killed. Total loss amounted to 10 million GEL. The floods were caused by heavy rains and snowmelt on March 22, 2008, causing flooding of the Rioni River and flooding into the

Kutkuta River, affecting 25 families and flooding the streets. In 2010 there were 2 cases of particularly heavy rains in Tskaltubo municipality with 54 mm of precipitation, and on October 5 of the same year, 64 mm of rainfall came in 6 hours. In Kutaisi in 2014, 27 mm of heavy rainfall was particularly high, as well as 71 mm of rainfall that flooded the streets and basements of the houses. In October 2018, heavy rains flooded the villages of Tskaltubo and Vani municipalities and paralyzed traffic; the electricity stopped, and the municipalities experienced great economic loss.

According to statistics, strong winds of January 23-25, 2009, which were 30 m/s, left 115,000 families of the Imereti region without electricity. 15 high-voltage masts have been installed. The trees were cut down. On September 11, 2010, strong winds in the Imereti region damaged power lines, houses, and trees. On February 2, 2011, electricity supply was cut off to 212,000 customers. In 2011 there were also three cases of strong winds at different times of the year - 32 m/s, also winds of 28-30 m/s, damaging the roofs of the houses, high-voltage power lines, and causing trees to fall. Five cases of wind in 2014 were recorded at 20-24 m/s, while four cases of strong winds occurred in 2015 at speeds of 20-30 m/s, which, of course, caused significant damage to the population and the municipal budgets.

Risk analysis in case of disasters

Currently, there is only one state structure in Georgia - the National Environmental Agency (NEA) of the Ministry of Environment Protection and Agriculture, which focuses on the identification, research, and management of natural disasters, including natural geological events. The National Disaster Risk Reduction Strategy of Georgia, approved by the Government of Georgia, plays an important role in the activities of the agency. All information about natural disaster events in the Imereti region is recorded and collected centrally in the National Environmental Agency. Data and analysis of natural disaster risks are published in the agency's annual reports. (<https://eiec.gov.ge/Ge/Newsletters/>).

The National Environmental Agency centrally identifies, assesses, monitors, determines the risk of hazards, sets emergency measures, and, where possible, renews instrumental monitoring. In accordance with the approved medium-term action plan, the Agency carries out activities in the geological direction in 4 main areas: geological monitoring (spring-autumn) and assessment of natural geological processes in force majeure situations; geomonitoring and building/updating of geological hazard (landslide, mudslide, etc.) zoning maps; monitoring of underground waters of drinking quality; and state geology mapping (geological planning).

Currently, the project “Climate Change Disaster Risk Reduction in Georgia” <https://www.undp.org/ka/georgia/projects/climate-change-disasters> (01.2019-12.2026 UNDP) is being implemented in Georgia, which aims to reduce the direct impact of climate change disasters on the population, livelihoods and infrastructure of Georgia, create a country-wide multi-hazard early warning system, and provide risk information through the implementation of risk reduction actions at the local level. As a result of the project:

- The hydrometeorological monitoring network is being updated and expanded across the country in cooperation with the National Environment Agency in order to enhance weather monitoring and forecasting
- Geological monitoring stations have been installed in 11 locations.
- For high-quality data processing and storage, a high-performance computer (HPC) was purchased for the National Environment Agency. The central information system is being updated, which ensures the automatic delivery of information from monitoring stations.
- A unified methodology was created for the assessment and modeling of natural hazards (floods, landslides, mudflows, snow avalanches, strong winds, hails, and droughts). The National Environment Agency prepared the maps of these hazards for the 7 main river basins of Western Georgia. The risk assessment on these rivers is being carried out using the relevant methodology, which is based on the best international practices and adapted to the Georgian context.
- The development of a disaster risk information system is underway, aiming to provide critical information about existing threats and risks to various government agencies and the population. At this stage, the system is in testing mode. Its implementation will be carried out jointly with the Emergency Management Service.
- A flood forecasting platform is under development and is currently being tested.
- Emergency management plans were developed for 6 municipalities (Telavi, Akhmeta, Lagodekhi, Gori, Sighnaghi, and Kobuleti).

- Based on hazard maps and international experience and best practices, a legal guide to zoning is being prepared. Considering all the standards mentioned in the document, it will be mandatory when planning and implementing infrastructure projects.
- Based on hazard maps and the socio-economic vulnerability assessment, the most vulnerable communities to the hazards are being identified, and relevant measures are being developed and implemented, where developing risk management plans and implementing priority measures are planned, including the purchase and installation of sirens, and the implementation of non-structural bio-engineering measures, such as afforestation and riverbed cleaning.
- Flood-protective infrastructure is being built in 15 locations throughout the country. Works have already been finalized at 7 locations.
- The assessment and development of institutional capacities of various state institutions are underway. Training in forecasting, hazard assessment, modeling, and other related topics is carried out for employees of relevant departments of various agencies and municipalities.
- In partnership with the Environmental Information and Education Centre of the Ministry of Environmental Protection and Agriculture, information campaigns and educational activities are taking place in 11 municipalities across Georgia.

This project covers the Imereti region along with other target regions, and its outcomes will ensure the implementation of risk assessment and rapid response systems in municipalities according to modern standards and the reduction of damage caused by natural disasters.

The roles of local public authorities in disaster situations

The place of local self-government bodies in the field of natural disaster risk management is determined by a number of normative acts. In some normative acts, local self-government bodies are directly referred to, while in others they are referred to as 'relevant authorities'.

Liquidation of the consequences of an emergency is carried out by local authorities through their own emergency management units and resources. These units shall be considered as bodies within the unified system defined by Article 13 of the Law of

Georgia on Protection of Population and Territory from Emergencies of a Natural and Technological Nature.

The provisions of the Governmental Commission on Emergency Management provide that the temporary emergency management committees are also set up in their area of operation by local authorities.

Georgian legislation empowers local authorities and governments to design and implement socio-economic development programs. Certain laws in the field of environmental protection, including laws on the environment, water, ambient air protection, wildlife, and the Forest Code - authorize local authorities to design and implement environmental actions, local programs, and events for environmental protection and natural resources management in order to solve specific problems, including the need to include natural disaster risk management issues.

Municipalities in the Imereti region have worked out the civil safety plans in accordance with the Law of Georgia „On Civil Safety“ and the Resolution of the Government of Georgia „On Approval of the National Civil Safety Plan“ No. 508 of September 24, 2015. The purpose of the municipal civil safety plan is to define in advance the measures to prevent, mitigate, and eliminate emergencies, their sequence and the forces and means required for their implementation. The emergency response plan should ensure the promptness of the coordinated actions of the structures, forces, and means involved in responding to emergencies.

In the event of extreme activation of natural disasters and processes in municipalities, upon the request of local government representatives and individual agencies, as well as information provided by the Ministry of Environmental Protection and Agriculture via hotlines “153” and “112”, the situation is assessed and the emergency measures are taken at the site.

Disaster response management in municipalities is carried out by the emergency response headquarters, taking into account the assistance functions, in accordance with the legislation in force existing in this field.

In case of emergency situations, the first-line units are obliged to be in constant contact with the municipal administration headquarters in order to prevent possible mobilization of forces and the escalation of further complications. To bring the current issue into a single system, a unified airwave (frequency) of the first-line response forces operates, and a unified emergency call - “emergency call”, which is used by the population.

Where it is necessary to involve several different response groups in works on liquidation of accidents, the operational emergency headquarters are immediately

deployed. The emergency headquarters is a local-level management center that coordinates the activities of the subjects involved in the prevention of emergency situations and the liquidation of the consequences caused by this situation. The headquarters meets at least twice a year, immediately upon the occurrence of an emergency situation. The need for an additional meeting is determined by the head of the emergency headquarters. The purpose of the headquarters meeting is to discuss on a municipal scale the following issues:

- Current status of civil defense tasks. Rational proposals for avoiding, preventing, and responding to expected emergencies;
- Developing special programs to address them;
- Ensuring safety in expected emergencies;
- Considering issues of prioritizing financial reserves in emergency situations.

The head of the municipality is a chief of the headquarters. The activities of the headquarters members are not reimbursed from the budget.

The emergency headquarters operates according to the functions of the response plan and makes decisions on expected or existing situations before the intervention of assistance at the regional or national level. Further management of the operation remains the same, and decision-making and guidance are carried out according to the national response plan.

A field operations center is established in the emergency zone, depending on the need, and its head is appointed by the chief of the emergency headquarters.

Cooperation with similar bodies/organizations in case of a disaster

Currently, the only state structure in Georgia is the National Environmental Agency of the Ministry of Environmental Protection and Agriculture, which focuses on the identification, research, and management of natural disasters, including natural geological events.

In accordance with the current legislation, Georgia has a national emergency response system, which consists of 3 levels corresponding to the scale of the disaster:

- Local small-scale disaster: is the responsibility of the municipality and its local emergency management department/unit.
- A disaster that exceeds the capabilities of the municipality becomes the responsibility of the regional government;
- A national-scale disaster is the responsibility of the central government.

At the operational level, crisis management is provided by the Ministry of Internal Affairs through the Emergency Management Department.

An important component of the national response system is the “112 Service”, which is under direct control of the Ministry of Internal Affairs. It is located in Tbilisi but operates throughout the country, and its services include emergency medical services, police, and fire departments. The service is staffed with trained personnel and provided with technical resources, through which traffic management on the roads is carried out, information is collected from the field level directly and online, and emergency vehicles and fire brigades are dispatched and moved.

The National Environmental Agency issues an annual bulletin (an information bulletin on the results of the development of natural geological processes in Georgia and the forecast for the next year), which is sent out to local municipalities, the Emergency Management Department, the Ministry of Regional Development and Infrastructure, non-governmental organizations, and other interested parties. The bulletin, which is also publicly available, reflects information about dangerous geological processes obtained as a result of monitoring and research during the period of extreme activation of the natural disaster. The bulletin is supported by maps depicting all types of geological processes and risky areas of potential geological hazard activation.

Since 2008, the Georgia Red Cross Society, as the only non-governmental institution, has been entrusted with the realization of specific tasks of the State National Plan for Natural Disasters and Technogenic Emergencies (based on Presidential Decree No. 415 of August 26, 2008).

The Georgia Red Cross Society is involved in search and rescue activities in emergency zones; under the coordination of the Emergency Management Department of the Ministry of Internal Affairs of Georgia, the Georgia Red Cross Society coordinates the activities to eliminate the consequences of emergency situations.

The Georgia Red Cross Society is an organization that makes suggestions to the Ministry of Labor, Health and Social Affairs of Georgia. In order to provide first aid to the wounded in emergency situations, the Society organizes a field hospital in such situations. The Georgia Red Cross Society is also an organization that assists to the Ministry of Agriculture of Georgia, providing food and water in emergency situations.

Participation in Training Programs on Disaster Management

Since 2019, training courses have been regularly held for MIA emergency workers, and firefighters and rescuers are trained and retrained by the Civil Safety Training Department of the MIA Academy of Georgia.

Also, training courses organized by the Georgia Red Cross Organization in disaster protection and first aid for schoolchildren and volunteers. Short-term training courses are available for students of higher education institutions.

In 2024, the Ministry of Environmental Protection and Agriculture, within the framework of the United Nations Development Program (UNDP) initiative “Reducing the Risk of Disasters Caused by Climate Change in Georgia”, conducted trainings on “Community-Based Disaster Risk Management and the Use of Hazard Maps” for youth, volunteers, and media representatives. The training aims to provide interested parties with information on the international and national framework for disaster risk management, develop a community risk management model plan, and learn how to use hydrometeorological hazard maps. The project is also going to conduct trainings on disaster management for representatives of municipalities in the Imereti region.

6.4 România – Galați County

General context

Galați County is located in southeastern Romania, near the Danube River and the Prut River. The area has a significant rural population density, with many localities situated in low-lying areas that are highly exposed to flooding, drought, and hydrological instability. The rural economy is predominantly based on agriculture, and access to modern public services is limited in many communes. In recent years, Galați has been affected by several natural disasters, which has led to increased interest in risk assessment and improving response capacities.

Main Risks Identified

Communities in Romania are exposed to a variety of hazards, which can be classified into several categories: natural, climatic, industrial, social, and health-related.

1. Natural Risks:

- Earthquakes: Romania is located in an active seismic zone, with the Vrancea region generating earthquakes that significantly impact Muntenia, Moldova, and southeastern Transylvania.
- Floods: Major rivers such as the Danube, Siret, Mureș, and Prut can cause severe flooding, damaging homes, infrastructure, and agricultural land.
- Landslides: Hilly regions and the Carpathian Mountains are prone to landslides, especially after deforestation or heavy rainfall.
- Soil subsidence: In certain areas, the soil may collapse, forming sinkholes and affecting infrastructure.

2. Climatic Risks:

- Heatwaves and drought: Increasingly hot summers lead to severe droughts, affecting agriculture and water resources.
- Blizzards and extreme temperatures: In winter, parts of Romania are affected by strong blizzards that block roads and isolate communities.
- Extreme weather events: Violent storms, tornadoes, and hail have become more frequent, causing significant material damage.

3. Industrial and Technological Risks:

- Industrial pollution: Cities like Bucharest, Ploiești, Brașov, and Galați face air, water, and soil pollution from industrial activities.
- Chemical accidents: There is a risk of toxic substance spills from factories, refineries, or chemical storage facilities.
- Fires and explosions in industrial zones: Fuel storage and production facilities pose a risk of major fires.

4. Social and Economic Risks:

- Unemployment and migration: The lack of jobs forces many Romanians to work abroad, affecting both the economy and demographic structure.
- Crime: Economic hardship can lead to rising crime, including theft, drug trafficking, or organized crime.

- Poverty and social exclusion: Rural communities and specific social groups are exposed to extreme poverty and lack essential services.

5. Health Risks:

- Epidemics and pandemics: Romania has faced influenza and measles outbreaks, as well as the recent COVID-19 pandemic, revealing weaknesses in the healthcare system.
- Limited access to medical services: In rural areas, hospitals are scarce, and the shortage of doctors affects the quality of healthcare.

6. Infrastructure Risks:

- Damaged roads and bridges: Many areas have outdated road infrastructure, increasing the risk of accidents and community isolation during disasters.
- Buildings vulnerable to earthquakes: Many old apartment blocks in large cities have not been retrofitted and pose a high seismic risk.

These hazards require effective preventive measures to protect communities and minimize the impact on the population and economy.

Major Past Emergency Situations

Romania has faced various types of disasters and emergencies that have highlighted infrastructure vulnerabilities, the responsiveness of authorities, and the population's level of preparedness.

1. Major Earthquakes:

- March 4, 1977 Earthquake (7.4 Mw) – The most devastating earthquake in Romania's modern history caused over 1,500 deaths (mostly in Bucharest) and destroyed numerous old buildings. It exposed the lack of building reinforcement and effective emergency systems.
- Vrancea Earthquakes (1990, 2004, 2016, 2022) – Although less destructive, these reminded the public of the ongoing vulnerability of older buildings in Bucharest and other cities.

2. Severe Floods:

- 2005 Floods – The worst floods in decades affected nearly the entire country, especially southern and eastern counties. Around 3,000 homes were destroyed and over 20,000 people evacuated.
- 2010 Floods – Severely impacted Moldova, particularly Suceava, Botoșani, and Galați counties, resulting in 24 deaths and the destruction of thousands of homes.

3. Extreme Weather Events:

- 2012 Blizzard – Blocked roads and entire communities in the southeast for days, especially in Buzău, Vrancea, and Brăila. This revealed the need for better snow removal equipment and emergency planning.
- 2017 Storms in Western Romania – A violent storm hit Timiș, Arad, and Cluj counties, killing 8 and injuring 137. The storm severely damaged infrastructure, highlighting vulnerabilities in electrical and transport systems.

4. Industrial and Technological Accidents:

- Mihăilești Explosion (2004) – A truck carrying ammonium nitrate exploded, killing 18 people. The incident revealed the lack of strict regulations for hazardous materials transport.
- Colectiv Nightclub Fire (2015) – This tragedy in Bucharest exposed poor fire safety enforcement and critical deficiencies in the healthcare system for burn victims.

5. Health Emergencies:

- COVID-19 Pandemic (2020–2022) – Tested the healthcare system’s capacity, exposing issues such as the lack of medical equipment, poor hospital infrastructure, and staff shortages.

Vulnerabilities of Romanian Communities

1. Infrastructure Vulnerabilities:

- Old buildings with high seismic risk – Especially in Bucharest and other major cities.
- Fragile road and bridge systems – Poorly developed road networks hinder emergency response.

- Power infrastructure problems – Strong storms and heavy snow frequently cause long power outages in rural areas.

2. Social and Economic Vulnerabilities:

- Poverty and social exclusion – Many rural communities lack access to essential services like healthcare, education, and utilities.
- Depopulation of villages – Massive migration has weakened local capacity for organized emergency response.
- Lack of disaster education – The population is generally unprepared to respond properly to emergencies.

3. Institutional Vulnerabilities:

- Lack of effective prevention strategies – Most protective measures are reactive rather than proactive.
- Underfunded emergency services – ISU (Inspectorate for Emergency Situations) lacks modern equipment and sufficient staff.
- Poor inter-institutional coordination – Communication and decision-making delays occur during critical events.

Galați County – Key Risks Identified

According to historical data and official reports, Galați County faces the following major risks:

- **Flooding:** The most significant events occurred in 2005, 2013, and 2024, causing deaths and affecting thousands of households. Floods are frequent due to overflows of the Prut, Siret, and Danube Rivers, as well as torrents formed on unprotected slopes.
- **Drought:** A recurring issue impacting agriculture. In 2006, 2007, and 2022, crop losses exceeded 60%, severely affecting farmers' incomes.
- **Landslides:** Common in hilly areas like Nicorești, Corod, and Valea Mărului, especially after heavy rainfall.

- Extreme Weather: Strong winds, blizzards, and hail have affected Galați. Storms in 2019 and 2020 caused major damage to electrical infrastructure and rural buildings.
- Earthquakes: While not in the epicentral zone, Galați is under the influence of the Vrancea seismic area. Moderate earthquakes can still cause damage in villages with old, non-retrofitted buildings.

Response Capacity and Prevention

1. Responsible Institutions in Romania:

- Department for Emergency Situations (DSU) – Coordinates interventions and collaborates with other authorities.
- General Inspectorate for Emergency Situations (IGSU) – Handles fire departments, rescuers, and coordination of rapid interventions.
- SMURD – The Mobile Emergency Service for Resuscitation and Extrication, essential in critical medical situations.
- Romanian Gendarmerie and Police – Support interventions and maintain public order.

2. Equipment and Infrastructure:

- Modern warning systems – RO-ALERT has been implemented to quickly inform the population in case of emergency.
- SMURD fleet of emergency vehicles and helicopters – Assist in rapid interventions, though resources are still limited.
- Coordination and command centers – These exist at both national and county levels, but decisions are sometimes delayed due to bureaucracy.

3. Prevention Programs and Measures:

- Awareness campaigns – Periodically carried out to inform the population about earthquakes, fires, and other disasters.
- Simulation exercises – Test response capacity in the event of earthquakes or other catastrophes.

- Infrastructure modernization projects – Some public buildings have been retrofitted, but progress is slow.

Community Involvement and Risk Education

Citizen participation in prevention activities is increasing, especially after the dramatic events of 2013 and 2024. However, organized volunteering remains limited.

- Educational programs on civil protection in schools are implemented occasionally through ISU or NGO projects.
- Awareness campaigns are mainly conducted through official channels (websites, posters, local radio), but they do not effectively reach all rural residents.
- Training local volunteer teams is a critical need, but few communes have trained groups.

Identified Needs

- Expanding rural intervention points, equipped with emergency vehicles and trained personnel.
- Regular training for local authorities to manage emergency plans.
- Public simulations in schools, markets, and other community spaces.
- Creation of local volunteer networks, in collaboration with ISU and NGOs.
- Investments in hydrotechnical infrastructure (levees, drainage channels, slope rehabilitation).
- Digitizing emergency alerts and disseminating them through SMS, mobile apps, and rural information networks.

Conclusion

Galați County has made significant steps in professionalizing disaster response, but it remains vulnerable in rural areas, where exposure to natural hazards is high, and resources are insufficient. Strengthening response capacity, community involvement, and developing public-private partnerships are priorities for reducing risks and increasing local resilience.

7. Conclusions and Strategic Recommendations

This report has provided a detailed analysis of the risks, vulnerabilities, and capacities of rural communities in four partner regions of the Black Sea Basin – **Galați (Romania), Cahul (Republic of Moldova), Varna (Bulgaria), and Imereti (Georgia)**. The findings highlight a shared reality across all these regions: **rural communities are exposed to a wide range of natural and man-made hazards, yet they lack the necessary capacity to manage them effectively**. This combination of high exposure and low institutional capacity generates **systemic risk**, threatening sustainable development, citizen safety, and social cohesion.

Despite geographic and institutional differences, several common patterns emerge. **Floods and landslides** are recurring hazards with significant economic and social impact. In many localities, the same areas are affected repeatedly, without sustainable preventive measures being implemented. Additionally, **drought, storms, fires, and technological risks** are growing concerns, intensified by **climate change, environmental degradation, and the lack of responsible spatial planning**.

Beyond natural risks, **social risks** such as mass migration, population aging, economic precarity, and limited access to infrastructure and public services must also be emphasized. These factors contribute to **low community resilience** and hinder emergency interventions. Often, **local authorities are the only actors on the ground** in the critical first hours of a disaster, but they are overwhelmed by the lack of human, logistical, and financial resources. Even where civil protection plans exist, they are often outdated, formal in nature, or unknown to citizens.

At the same time, important institutional development efforts have been made, particularly in **Bulgaria and Romania**, through access to **EU funding**. In **Georgia and Moldova**, support from international partners (UNDP, Red Cross, international NGOs) has helped launch promising initiatives, though these remain insufficiently widespread. **Risk education, simulation exercises, and community involvement** are still sporadic, but they hold strong potential to become pillars of local resilience.

In this context, the report outlines several **strategic directions** that can contribute to reducing risks and strengthening the capacity of rural communities in the Black Sea Basin:

1. Invest in Prevention, Not Only in Response

Public policies and funding must shift toward **preventive measures**—such as hydrotechnical infrastructure, stabilization of unstable slopes, modernization of drainage systems, and development of access roads for intervention teams. **Prevention is cheaper, more efficient, and more sustainable** than reacting to emergencies.

2. Strengthen Local Authorities—Capacity

There is a need for **trained personnel, modern equipment**, and clear coordination mechanisms within municipalities. Ongoing training of civil protection officers, updating local emergency plans, and organizing regular practical exercises are essential steps. Collaboration between local administrations and specialized county/district institutions must also be supported.

3. Foster a Community Culture of Resilience

Citizens must not be mere beneficiaries of interventions but **active participants** in prevention and response. Through **training, simulations, and volunteering**, communities can become better prepared and more united in the face of crises. Schools, churches, cultural centers, and even local markets can become hubs for civic education and information.

4. Integrate Risk into Spatial Planning and Economic Development

Rural development must take into account **climatic and geological realities**. Risk maps should be used in construction projects, unstable zones must be avoided for new developments, and more **resilient economic activities** should be promoted—such as drought-adapted agriculture, sustainable agrotourism, or local creative industries.

5. Encourage Cross-Border and Regional Cooperation

Shared problems require shared solutions. Partnerships between authorities from the four countries, exchange of best practices, joint simulation exercises, and the

development of **shared databases** are concrete tools for increasing the coherence and efficiency of disaster response.

6. Ensure Equitable Access to Funding and Resources

National and international funding programs must genuinely support rural communities, including **small or isolated ones**, which often lack the administrative capacity to access competitive funds. **Technical assistance, project writing support, and mechanisms for inter-municipal cooperation** can help reduce these inequalities.

This report demonstrates that **reducing risk and increasing the resilience of rural communities in the Black Sea Basin** is not just a necessity—it is an opportunity. Through a **data-driven, collaborative, and accountable approach**, these communities can transition from being **frequent victims of disasters** to becoming **capable, aware, and prepared actors**. It will take **political will, civic engagement, and institutional continuity** to make this transformation a reality.



**National Society of Red Cross Romania - Galati
Branch, Romania**



**Cross-border Cooperation and European
Integration Agency**



Union of Bulgarian Black Sea Local Authorities



Imereti Scientists' Union "Spectri"

The responsibility for the content of this material lies with the National Society of Red Cross Romania - Galati Branch. The content of this material does not necessarily reflect the official position of the European Union. Reproduction is authorised, provided the source is acknowledged and any changes are indicated.