



Strengthening the Resilience of EU Border Regions

Mapping Risks & Crisis Management Tools and Identifying Gaps

Border fiches and maps

Written by Technopolis Group, CMCC, and Nordregio
March – 2024

technopolis
group 



Nordregio

EUROPEAN COMMISSION

Directorate-General for Regional and Urban Policy
Directorate D — European Territorial Cooperation, Macro-Regions, INTERREG & Programmes Implementation I
Unit D.2 — INTERREG, Interregional Cooperation, Internal Borders

E-mail: REGIO-D2-CROSS-BORDER-COOPERATION@ec.europa.eu

*European Commission
B-1049 Brussels*

Strengthening the Resilience of EU Border Regions

Mapping Risks & Crisis Management Tools and Identifying Gaps

Border Fiches and Maps

Contract No 2021CE160AT171

Manuscript completed in March 2024

1st edition

The European Commission is not liable for any consequence stemming from the reuse of this publication.

Luxembourg: Publications Office of the European Union, 2024

© European Union, 2024



The reuse policy of European Commission documents is implemented based on Commission Decision 2011/833/EU of 12 December 2011 on the reuse of Commission documents (OJ L 330, 14.12.2011, p. 39). Except otherwise noted, the reuse of this document is authorised under a Creative Commons Attribution 4.0 International (CC-BY 4.0) licence (<https://creativecommons.org/licenses/by/4.0/>). This means that reuse is allowed provided appropriate credit is given and any changes are indicated.

For any use or reproduction of elements that are not owned by the European Union, permission may need to be sought directly from the respective rightholders.

Table of Contents

- 1. Gaps analysis and recommendations by individual borders 11**
 - 1.1. Analytical tables per individual border with recommendations, and visualisation maps 13

Tables (and maps)

Table 1 AUSTRIA - SWITZERLAND 13

Table 2 AUSTRIA - SLOVENIA..... 16

Table 3 BELGIUM - GERMANY 19

Table 4 BELGIUM – LUXEMBURG 22

Table 5 BELGIUM – NETHERLANDS..... 25

Table 6 BULGARIA - GREECE 28

Table 7 BULGARIA - NORTH MACEDONIA..... 31

Table 8 BULGARIA - SERBIA..... 34

Table 9 CZECH REPUBLIC - AUSTRIA 37

Table 10 CZECH REPUBLIC -SLOVAKIA 40

Table 11 SLOVAKIA - AUSTRIA..... 43

Table 12 SLOVAKIA - HUNGARY 46

Table 13 GERMANY - AUSTRIA 50

Table 14 GERMANY - SWITZERLAND 53

Table 15 GERMANY – CZECH REPUBLIC 56

Table 16 GERMANY - DENMARK 59

Table 17 GERMANY - POLAND 62

Table 18 DENMARK - SWEDEN 65

Table 19 ESTONIA - LATVIA..... 67

Table 20 GREECE - NORTH MACEDONIA..... 70

Table 21 SPAIN – FRANCE..... 73

Table 22 SPAIN - PORTUGAL..... 76

Table 23 FINLAND - NORWAY..... 79

Table 24 FRANCE - BELGIUM 82

Table 25 FRANCE - SWITZERLAND..... 85

Table 26 FRANCE - GERMANY	88
Table 27 FRANCE - ITALY	91
Table 28 FRANCE - LUXEMBURG.....	93
Table 29 CROATIA - SERBIA	96
Table 30 HUNGARY - AUSTRIA.....	99
Table 31 HUNGARY - CROATIA	102
Table 32 HUNGARY - ROMANIA	105
Table 33 HUNGARY - SLOVENIA	108
Table 34 IRELAND - UK	111
Table 35 ITALY - AUSTRIA	114
Table 36 ITALY - SWITZERLAND	117
Table 37 ITALY – CROATIA	118
Table 38 ITALY – MONTENEGRO	121
Table 39 LITHUANIA – POLAND.....	123
Table 40 LUXEMBURG – GERMANY.....	126
Table 41 LATVIA - LITHUANIA.....	129
Table 42 MALTA - ITALY	132
Table 43 NETHERLANDS - GERMANY	134
Table 44 POLAND - CZECH REPUBLIC	137
Table 45 POLAND – SLOVAKIA.....	140
Table 46 ROMANIA - BULGARIA	143
Table 47 ROMANIA - SERBIA	146
Table 48 SWEDEN - FINLAND.....	149
Table 49 SWEDEN - NORWAY	152
Table 50 SLOVENIA - CROATIA	155
Table 51 SLOVENIA – ITALY	158
Table 52 FINLAND – ESTONIA	161

Table 53 CENTRAL BALTIC 163

Abbreviations

Abbreviation	Full name
AEBR	Association of European Border Regions
APC EG	The Accident Prevention and Control Expert Group
CBC	Cross-border crisis
CBCRII	Cross-Border Crisis Response Integrated Initiative
CBRN	Chemical, biological, radiological, and nuclear
CBSS	Council of the Baltic Sea States
CCA	Climate change adaptation
CDP	Carbon Disclosure Project
CECIS	Common Emergency Communication and Information System
CEMS	Copernicus Emergency Management Service
CER	Critical Entities Resilience Directive
CMCC	Centro Euro-Mediterraneo sui Cambiamenti Climatici
CPI	Civil Protection Financial Instrument
DG ECHO	Directorate-General for European Civil Protection and Humanitarian Aid Operations
DG ENV	Directorate-General for Environment
DG RTD	Directorate-General for Research and Innovation
DG SANTE	Directorate-General for Health and Food Safety
DPEG	Disaster Prevention Expert Group
DRM	Disaster risk management
DRMKC	Disaster Risk Management Knowledge Centre
RDH	Risk Data Hub
DRR	Disaster risk reduction
EC	European Commission

Abbreviation	Full name
ECDC	European Centre for Disease Prevention and Control
EDO	European Drought Observatory
EEA	European Economic Area
EFAS	European Flood Awareness System
EFFIS	European Forest Fire Information System
EMRIC	Euregio Maas-Rhine Incident Response and Crisis Management
ERC	European River Catchments
ERCC	European Response Coordination Centre
ESG	Environmental, social, and corporate governance
ESSL	European Severe Storms Laboratory
ESWD	European Severe Weather Database
EU	European Union
EUSDR	EU Strategy for the Danube region
EWRS	Early Warning and Response System
FI	Flagship Initiative
GHSL	Global human settlement layer
GI	Green Infrastructure
GIS	Geographic information systems
HEU	Horizon Europe
HSC	Health Security Committee
ICLEI	Local Governments for Sustainability
ICPDR	International Commission for the Protection of River Danube
ICT	Information and communication technology
IHR	International Health Regulations
INFORM	Index for Risk Management

Abbreviation	Full name
IPA	Instrument for Pre-accession Assistance
JRC	Joint Research Centre
KCMD	Knowledge Centre on Migration and Demography
MAP	Mediterranean Action Plan
MIRG-EX	Maritime Incident Response Group
MoU	Model Memorandums of Understanding
MS	Member States
NGO	Non-governmental organization
NIS	National network and information systems
NRA	National risk assessment
NUTS	Nomenclature of territorial units for statistics
OECD	Organisation for Economic Co-operation and Development
PA	Priority Area
PAP/RAC	Priority Actions Programme/Regional Activity Centre
PHEIC	Public Health Emergencies of International Concern
PwD	Persons with Disabilities
RRF	Recovery and Resilience Fund
RVA	Risk and vulnerability assessment
TEN-T	Trans-European Transport Network
TMF	Tailings Management Facilities
ToR	Terms of Reference
UCPKN	Union Civil Protection Knowledge Network
UCPM	Union Civil Protection Mechanism
UN	United Nations
UNDRR	United Nations Office for Disaster Risk Reduction

Abbreviation	Full name
UNECE	United Nations Economic Commission for Europe
WFD	Water Framework Directive
WG	Working Group
WWF	World Wildlife Fund

Glossary

Concepts and terminology	Description
Border region	Region comprised in the NUTS 3 classification with a land border and NUTS 3 regions where more than half of the population lives 25 km from a land border.
Cross-border region	Territory comprised by two or more contiguous border regions on different sides of at least one national border.
Cross-border territory	Territory composed of the cross-border regions along the entire border.
Disaster risk	The potential loss of life, injury, or destroyed or damaged assets which could occur to a system, society or a community in a specific period of time, determined probabilistically as a function of hazard, exposure, vulnerability and capacity.
Disaster Risk Management	Disaster risk management is the application of disaster risk reduction policies and strategies to prevent new disaster risk, reduce existing disaster risk and manage residual risk, contributing to the strengthening of resilience and reduction of disaster losses. It covers four main phases: prevention, preparedness, response, and recovery and lessons learnt.
Exposure	The situation of people, infrastructure, housing, production capacities and other tangible human assets located in hazard-prone areas.
Hazard	A process, phenomenon or human activity that may cause loss of life, injury or other health impacts, property damage, social and economic disruption or environmental degradation. Also referred to as “risk” in the study.
Probability	Degree of likelihood for an event to occur.
Risk management capability	The ability of a Member State or its regions to reduce, adapt to or mitigate risks (impacts and likelihood of a disaster), identified in its risk assessments to levels that are acceptable in that Member State. Risk management capability is assessed in terms of the technical, financial and administrative capacity.
Vulnerability	The conditions determined by physical, social, economic and environmental factors or processes which increase the susceptibility of an individual, a community, assets or systems to the impacts of hazards.

Disclaimer

The information and views set out in this study are those of the authors and do not necessarily reflect the official opinion of the Commission.

The Commission does not guarantee the accuracy of the data included in this study.

Neither the Commission nor any person acting on the Commission's behalf may be held responsible for the use which may be made of the information contained therein.

The reuse policy of European Commission documents is implemented by the Commission Decision 2011/833/EU of 12 December 2011 on the reuse of Commission documents (OJ L 330, 14.12.2011, p. 39). Except otherwise noted, the reuse of this document is authorised under a Creative Commons Attribution 4.0 International (CC-BY 4.0) licence (<https://creativecommons.org/licenses/by/4.0/>). This means that reuse is allowed provided appropriate credit is given and any changes are indicated.

For any use or reproduction of elements that are not owned by the European Union, permission may need to be sought directly from the respective rightsholders.

1. Gaps analysis and recommendations by individual borders

This publication presents the key highlights deriving from the **in-depth gap analysis performed on each individual border** falling under the scope of the study on *Strengthening the resilience of EU border regions: Mapping risks & crisis management tools and identifying gaps*, as well as corresponding recommendations.

The information is provided through a set of clear and concise **analytical tables dedicated to the individual borders** with details covering an overall review of risks, discrepancies in risk assessment, exposures and vulnerabilities, potential impact of the relevant risks, governance readiness and gaps, availability/gaps of cross-border tools/agreements, recommendations, as well as data availability/quality and resulting impact on the reliability of the assessment.

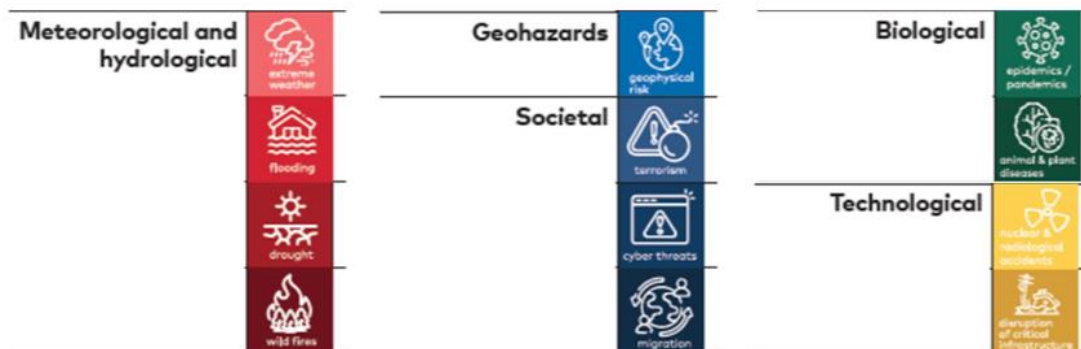
The data has been visualised as a **set of GIS-based maps for each border region with infographics describing risk assessment** (probability and impact).

The **capability of the countries to act jointly to address the risk** (all DRM phases) across the borders is presented in a table below the maps.

Such an approach gives an opportunity to get an overview of the whole range of hazards and spot the main risks and differences in assessment between the countries as well as weaknesses in terms of capabilities to address the risks in a joint collaborative manner across the border.

More specifically, for each non-maritime border there is a designated map that provides overview of key geographic features of the border region: landscape, hydrography, major cities. The border region is also marked according to the agreed definition. Each risk has been assigned an icon and each risk group a colour, as shown in the figure below.

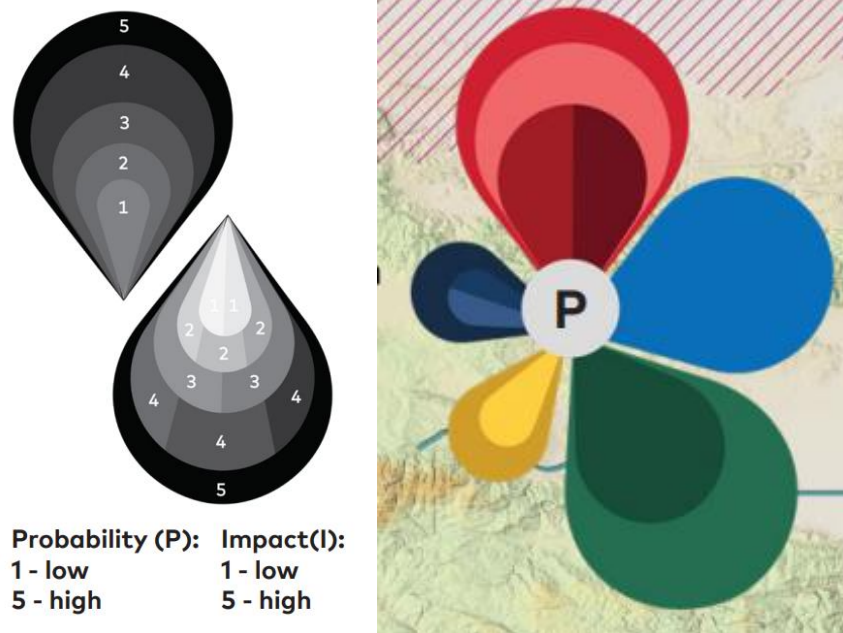
Figure 1 Hazard grouping and icons



Each map highlights the most critical information regarding the probability of risks and their potential impact by visualising 12 hazards in flower-shaped figures.

Hazard probability is formed in a 'flower', where each of the five petals represents a distinct hazard category. Probability levels from 1 to 5 correspond to a specific petal size. If two or more risks from the same group have the same probability, the petal is divided into a relevant number of same-sized parts (Figure 2 Flower infographic used). The legend is provided on the side to serve as a reference scale to the level of hazard probability or impact. For each map, there are four figures in total: two representing probabilities of risks on either side of the border, and the other two showcasing impacts on both sides.

Figure 2 Flower infographic used





A similar approach is used for visualising **potential impacts**. When displayed next to probability assessments, the potential impact draws attention to those hazards, that may not have a high probability, but potential impacts are significant. Unlike probabilities, impact calculation results produce bigger variations in scale. For the sake of keeping the infographic accessible and readable, the resulting number was rounded to two decimal places.

The information about the gaps in capability for joint action, which emerges from the juxtaposition of the two sides of the border, is presented in a table below the map, accompanied by an explanatory text to draw attention to the cases where there is one of the two cases: high probability/low capability and high impact/low capability. Risks with a high probability (above 3) and low capability (below 1,5) are highlighted in orange in the table, those with high impact (above 3) and low capability (below 1,5) are highlighted in red in the figure below, while those with low capability but both high probability and high impact are highlighted in dark red.

1.1. Analytical tables per individual border with recommendations, and visualisation maps

Table 1 AUSTRIA - SWITZERLAND

AUSTRIA - SWITZERLAND	 
<u>Overall review of risks</u>	
The most important risks are: Flooding (5); Geophysical risks (4). Low probability/likelihood is agreed for wildfires (1), epidemics/pandemics (1), and disruption of critical infrastructure (1).	
<u>Discrepancies in risk assessment</u>	
Flooding on both sides of the border has been assessed as high risk (5). As for geophysical risks, the expert assessment carried out on the Austrian side of the border indicates a higher probability (5) than the corresponding assessment undertaken in Switzerland (3). There are discrepancies for all other risks.	
<u>Exposures and vulnerabilities</u>	
The Austrian assessment shows that meteorological and technological risks mostly expose production capacities and infrastructure. Housing is assessed as being vulnerable to nuclear and radiological risks. On the Swiss side of the border, production capacities, infrastructure and housing are exposed to flooding and extreme weather risks. Production capacities and agriculture are highly vulnerable to droughts, while infrastructure and housing are highly vulnerable to geophysical risks.	
<u>Potential impact</u>	
On both sides of the border, the economy, supply security, infrastructure and international activities have the potential to be impacted by meteorological and technological risks as well as geohazards. Epidemics and pandemics would impact the functional capacity of the population and services.	
<u>Governance readiness and gaps</u>	
Austria and Switzerland show good capabilities to jointly manage meteorological/hydrological risks as well as nuclear/radiological accidents. Although there might be scope for improvements on the joint capabilities to manage all the other risks, there are several bilateral agreements in place to manage multi-risks.	
<u>Availability/gaps of cross-border tools/agreements</u>	
Several cross-border agreements were found for response to emergencies (from all type of disasters), specifically with regards to flooding, nuclear and radiological accidents. Although it appears that there are no instruments or projects which involve only the AT-CH border, a number of instruments and tools are implemented at the multi-border level, mainly in prevention (two for floodings and two multi-risks) and preparedness (wildfires, two for multi-risks, one for flooding); also, one multi-level project on the prevention of extreme weather was implemented.	
<u>Recommendations</u>	
Joint Capability Enhancement:	
Focus on strengthening the joint capability to manage geophysical risks, especially considering the discrepancies in risk assessment between Austria and Switzerland. This could involve collaborative research, knowledge sharing, and joint risk assessment exercises.	
Inclusion of Cross-Border Risks:	
Implement practices to include cross-border risks in national risk assessments in both Austria and Switzerland. This would improve the understanding of shared risks and enhance coordination in risk management efforts.	
Enhanced Cross-Border Coordination:	
Explore opportunities to improve cross-border coordination, particularly in the prevention phase of disaster management. Foster dialogue and cooperation between relevant authorities and stakeholders to develop joint strategies and action plans for risk prevention.	

AUSTRIA - SWITZERLAND



Utilization of Existing Agreements:

Make use of existing bilateral agreements for emergency response and management of specific hazards such as flooding and nuclear/radiological accidents. Ensure that these agreements are effectively implemented and reinforced to address emerging challenges.

Data Sharing and Quality Improvement:

Invest in initiatives to enhance data sharing and improve the quality of risk assessment data, especially on the Swiss side of the border where data availability is limited. Establish mechanisms for regular updates and maintenance of risk assessment databases.

Promotion of Multi-Border Projects:

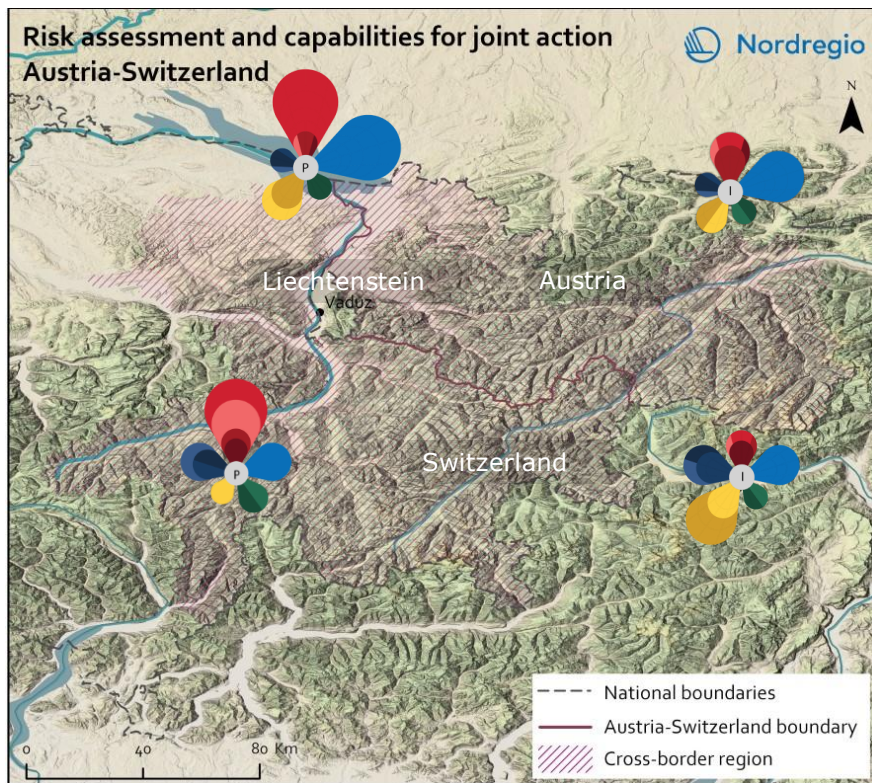
Encourage the implementation of multi-border projects that address shared risks and vulnerabilities across multiple countries. Support initiatives that focus on prevention, preparedness, and response to various hazards, including floods, wildfires, extreme weather events, and multi-risks.

Capacity Building and Training:

Provide support for capacity building and training programs aimed at enhancing the skills and capabilities of local authorities, emergency responders, and communities in disaster and risk management. Foster collaboration between relevant institutions and organizations to exchange best practices and lessons learned.

Data availability/quality and resulting impact on reliability of the assessment

Data availability and quality is assessed as high for the Austrian side of the border; only data on the likelihood of epidemic, terrorist or cyber risks is missing. For the Swiss border, the risk assessment scores for some hazards are missing due to the lack of publicly available data (biological and technological risks). Moreover, all scores included for the Swiss side are qualitative and subjective as the NRA does not include a specific quantitative assessment on this border. The other documents consulted provide information that is not fully in line with the methodology used in this study. The authors evaluated the scores using publicly available data and information.



LEGEND

Each side of the petal represents a different risk level, with the smallest petal indicating a low risk level (1).

When risk groups have identical values, they are depicted within the same petal, segmented by the color associated with each risk group.





Probability (P):
1 - low
5 - high

Impact (I):
1 - low
5 - high

		Probability		Impact		Capability
		Austria	Switzerland	Austria	Switzerland	Average
Meteorological and hydrological	extreme weather	1	4	3	2.33	2.5
	flooding	5	5	3	2.17	3
	drought	1	2	2.33	1.83	2.5
	wild fire	1	1	2.67	1	2.5
Geohazards	geophysical risk	5	3	3.67	3	1
Biological	epidemics/pandemics	-	2	1	1.33	1
	animal & plant diseases	1	2	1	1.33	0.5
Technological	nuclear & radiological accidents	3	1	1.67	2	3
	disruption of critical infrastructure	2	-	2.17	4	1
Societal	terrorism	1	3	1	3	1
	cyber threats	1	2	1	2	1
	migration	1	2	1	3	1

ORANGE: high probability (3 or higher) and low capability (1.5 or lower)
RED: high impact (3 or higher) and low capability (1.5 or lower)
DARK RED: low capability comes along with both high probability and high impact

Table 2 AUSTRIA - SLOVENIA

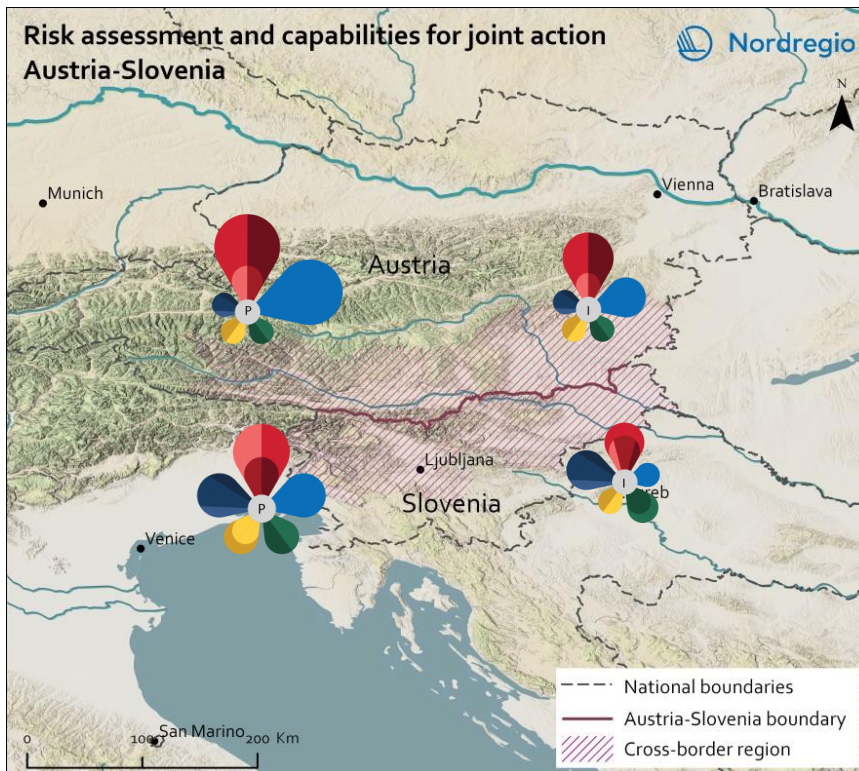
AUSTRIA - SLOVENIA	 
<p><u>Overall review of risks</u></p> <p>The risks with a high probability of occurring are: Flooding (4.5); Geophysical risks (4); Wildfires (3.5) are considered high risks. Average risks have been identified for extreme weather (3).</p>	
<p><u>Discrepancies in risk assessment</u></p> <p>There are some discrepancies in the assessment of the risks, especially for Wildfires (5 Austria, 2 Slovenia); Geophysical risks (5 Austria, 3 Slovenia); Migration (1 Austria, 3 Slovenia); Extreme weather (2 Austria, 4 Slovenia).</p>	
<p><u>Exposures and vulnerabilities</u></p> <p>The Austrian assessment shows that flooding, wildfires, and landslides would expose housing, production capacities, and infrastructure to such risks. In addition, all three would also be exposed to extreme weather and drought, although to a lesser degree.</p> <p>Similar goes for Slovenia: flooding and landslides could affect housing, production and infrastructure as seen in the floods in summer 2023. Extreme weather could have similar effects, while wildfires and drought would affect the area to a lesser degree.</p>	
<p><u>Potential impact</u></p> <p>On the Austrian side of the border, meteorological and geophysical risks would likely impact all aspects (economy, infrastructure, functional capacity of the population and services, international and EU activities, defence, and internal capabilities). The same goes for Slovenia, with high risks of floods.</p>	
<p><u>Governance readiness and gaps</u></p> <p>There are a few minor discrepancies in the assessment of capabilities to address risks (1 point difference). For extreme weather, the capability on the Slovenian border has been assessed as medium, while no capability was identified on the Austrian border.</p>	
<p><u>Availability/gaps of cross-border tools/agreements</u></p> <p>On the Austrian side of the border, no tools or agreement were identified for meteorological (except flooding), geophysical, and biological risks. However, the agreement on cooperation in prevention and mutual assistance in the event of disasters or severe accidents could be applied in these contexts. For risks of nuclear accidents, cyber threats, and migration risks, only one agreement is available. However, there is nothing or very little in addition to this agreement in terms of processes, tools, institutions, or projects.</p>	
<p><u>Recommendations</u></p> <p>Strengthen Capability through Cooperation Projects:</p> <p>Implement targeted cooperation projects and capacity-building initiatives to strengthen the capability of both Austria and Slovenia in addressing high and average risks identified in the border region. These projects should focus on areas such as flood management, wildfire prevention, and landslide mitigation.</p> <p>Focus on Additional Risks:</p> <p>Direct future cross-border cooperation projects towards addressing risks of nuclear accidents, cyber threats, and migration, which have been identified as areas lacking sufficient agreements, tools, and institutions. Develop joint strategies and action plans to enhance preparedness and response capabilities for these emerging risks.</p> <p>Improve Data Availability and Quality:</p> <p>Enhance cross-border information-sharing mechanisms and conduct joint risk assessments specific to the cross-border region to improve data availability and quality. Establish collaborative platforms for sharing risk-related data and conducting joint analyses to better understand shared risks and vulnerabilities.</p> <p>Transparency and Collaboration in Risk Assessment:</p> <p>Promote transparency and collaboration in risk assessment processes by engaging key experts from both countries and leveraging publicly available data. Foster dialogue and cooperation between relevant authorities to ensure comprehensive and accurate risk assessments that account for cross-border contexts.</p>	

AUSTRIA - SLOVENIA



Data availability/quality and resulting impact on reliability of the assessment

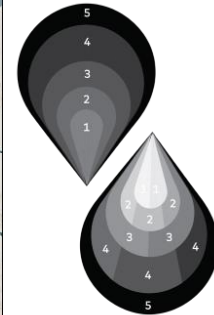
On the Slovenian side there are a number of national risk assessments available, but little or no information is available on risks in the border regions or cross-border territory. Data availability and quality is assessed as medium-to-low for the Austrian side of the border given that only five agreements were found, while data on the likelihood of risks happening is unavailable. The Austrian assessment is qualitative and subjective given the constraints met during data collection which included unavailability of key experts for interviews, unresearched risks (incl. their probability of happening, their impact and the exposure of society and economy) and when these have been researched, they may not be shared given their sensitivity (for example the risk of terrorism). Therefore, the assessment is based on a comprehensive body of publicly available data and information accessed through desk research or cutting edge AI tools such as Perplexity.



LEGEND

Each side of the petal represents a different risk level, with the smallest petal indicating a low risk level (1).

When risk groups have identical values, they are depicted within the same petal, segmented by the color associated with each risk group.





Probability (P):
 1 - low
 5 - high

Impact (I):
 1 - low
 5 - high

		Probability		Impact		Capability
		Austria	Slovenia	Austria	Slovenia	Average
Meteorological and hydrological	extreme weather	2	4	1	2.33	2
	flooding	5	4	3.67	2.83	1
	drought	2	2	1	2.17	0.5
	wild fires	5	2	3.5	2	0.5
Geohazards	geophysical risk	5	3	3	1.33	0.5
Biological	epidemics / pandemics	1	2	1	1.5	0.5
	animal & plant diseases	1	2	1	1.33	0.5
Technological	nuclear & radiological emergencies	1	1	1	1	1.5
	disruption of critical infrastructure	1	2	1	1.17	0.5
Societal	terrorism	1	3	1	2.83	1
	cyber threats	1	3	1	3.33	1
	migration	1	3	1	2.5	1.5

ORANGE: high probability (3 or higher) and low capability (1.5 or lower)
RED: high impact (3 or higher) and low capability (1.5 or lower)
DARK RED: low capability comes along with both high probability and high impact

Table 3 BELGIUM - GERMANY

BELGIUM - GERMANY	 
<p><u>Overall review of risks</u></p> <p>The following hazards emerge as having a high probability of occurring: Extreme weather (5); Drought (4); Wildfires (4); Epidemics/pandemics (4-BE and 3-DE); Cyber threats (5); Flooding (4).</p>	
<p><u>Discrepancies in risk assessment</u></p> <p>There are almost no discrepancies in the risk assessment along both sides of the border. The only significant discrepancy relates to flooding, which has a score of 4 in Germany and 2 in Belgium. The discrepancy results, in part, from a low assessment of flooding risk in the Belgian National Disaster Assessments. However, the 2021 floodings evidenced a high vulnerability of the region.</p>	
<p><u>Exposures and vulnerabilities</u></p> <p>There is an overall low exposure given that the region is rural with a low population and infrastructure density. Production capacities and housing are more exposed on the German side of the border, particularly to extreme weather. The risk of seismic activity is moderate but higher than in the rest of both countries, and is focused in zones with higher population density, commercial activity, and infrastructure.</p>	
<p><u>Potential impact</u></p> <p>The risks with the highest potential impact on both sides of the border include extreme weather, flooding, interruption of critical infrastructure, and pandemics. Infrastructure and functional capacity are at moderate risk of seismic activities.</p>	
<p><u>Governance readiness and gaps</u></p> <p>There is significant heterogeneity in terms of governance structure across hazards and across both sides of the border. Both countries seem more ready to address meteorological and hydrological hazards compared to the other risks.</p> <p>Gaps in governance are noted for seismic activity, with no agreements, risk assessments, or specific tools or projects addressing this risk at the border.</p>	
<p><u>Availability/gaps of cross-border tools/agreements</u></p> <p>There are gaps in seismic activity governance: no agreements, no risk assessment at the border, no processes, tools, institutions, or projects. However, there exists a comprehensive joint governance of disaster management for flooding and wildfire risks.</p>	
<p><u>Recommendations</u></p> <p>Strengthen Governance Capabilities:</p> <p>Allocate resources and develop comprehensive strategies to strengthen governance capabilities for extreme weather, drought, epidemics/pandemics, and cyber threats, which have been identified as higher-than-average risks. Establish joint governance structures and protocols to facilitate cross-border cooperation in managing these hazards effectively.</p> <p>Develop Region-Specific Risk Assessments:</p> <p>Conduct region-specific risk assessments to identify and assess hazards such as seismic activity, which currently lacks adequate governance mechanisms at the border. Collaborate with relevant stakeholders and experts to gather data, analyse risks, and develop tailored strategies for mitigating and managing these hazards in the border region.</p> <p>Enhance Data Availability and Quality:</p> <p>Improve data availability and quality, particularly for risks not covered in national assessments such as wildfires and migration. Invest in data collection infrastructure and collaborative platforms to facilitate the sharing of risk-related data between Belgium and Germany. Ensure that risk analyses are based on accurate and reliable data to inform decision-making and resource allocation.</p> <p>Promote Cross-Border Cooperation Mechanisms:</p> <p>Establish cross-border cooperation mechanisms and agreements to address gaps in governance for hazards like seismic activity. Foster collaboration between relevant authorities, emergency responders, and</p>	

BELGIUM - GERMANY



stakeholders to develop joint strategies, protocols, and response plans for managing disasters and emergencies in the border region.

Facilitate Knowledge Sharing and Capacity Building:

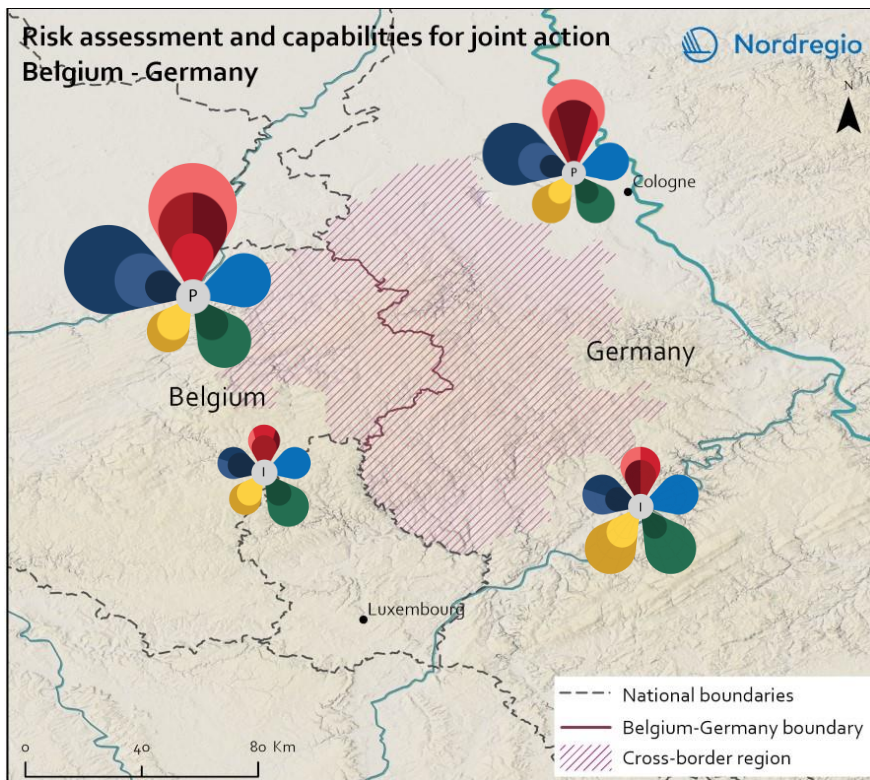
Organize workshops, training programs, and knowledge-sharing events to enhance the capacity of local communities, authorities, and organizations in disaster and risk management. Exchange best practices, lessons learned, and innovative solutions to build resilience and preparedness in the Belgium-Germany border region.

Ensure Continuity and Sustainability:

Ensure continuity and sustainability of cross-border cooperation initiatives beyond the duration of specific projects or funding cycles. Establish mechanisms for sustained interaction and collaboration across borders, including regular meetings, joint exercises, and information-sharing platforms, to maintain and enhance the effectiveness of disaster and risk management efforts in the long term.

Data availability/quality and resulting impact on reliability of the assessment

Wildfire and migration risks are not assessed in the Belgian National Risk Assessment – alternative sources were used (Thinkhazard, EFFIS). For Germany, the availability and quality of data on natural disasters is high. The analysis is primarily based on national risk assessments of the responsible authorities, which are partly based on GIS visualization. Risk analyses on animal and plant diseases are of high quality and are regularly updated. For man-made disasters such as nuclear accidents, the disruption of critical infrastructure, terrorism, and cyber-attacks, as well as epidemics/pandemics, it was only possible to draw on national analyses that were not region-specific.



LEGEND

Each side of the petal represents a different risk level, with the smallest petal indicating a low risk level (1).

When risk groups have identical values, they are depicted within the same petal, segmented by the color associated with each risk group.





Probability (P):
1 - low
5 - high

Impact (I):
1 - low
5 - high

		Probability		Impact		Capability
		Belgium	Germany	Belgium	Germany	Average
Meteorological and hydrological	extreme weather	5	5	2.33	2.83	2
	flooding	2	4	1.5	3	3
	draught	4	4	1.33	1.5	1.5
	wild fires	4	4	1.5	1.5	3
Geohazards	geophysical risk	3	3	2.17	2.5	0
Biological	epidemics / pandemics	4	3	2.67	3.67	2
	animal & plant diseases	1	1	1	1	0
Technological	nuclear & radiological accidents	1	1	1	2	0
	disruption of critical infrastructure	3	3	2.17	4	0
Societal	terrorism	3	3	2	3	2
	cyber threats	5	5	2.33	3	1
	migration	1	1	1	1	0

ORANGE: high probability (3 or higher) and low capability (1.5 or lower)
RED: high impact (3 or higher) and low capability (1.5 or lower)
DARK RED: low capability comes along with both high probability and high impact

Table 4 BELGIUM – LUXEMBURG

BELGIUM – LUXEMBURG	 
<p><u>Overall review of risks</u></p> <p>Two hazards were rated as overall more likely than average to occur: Cyber threats; Epidemics/pandemics.</p>	
<p><u>Discrepancies in risk assessment</u></p> <p>There are significant discrepancies across several hazards in this border. The most significant are the following:</p> <p>Flooding (3 Belgium, 5 Luxembourg); Extreme weather (4 Belgium, 2 Luxembourg); Wildfires (3 Belgium, 1 Luxembourg); Epidemics and pandemics (4 Belgium, 2 Luxembourg); Disruption of critical infrastructure (3 Belgium, 1 Luxembourg); Cyber threats (5 Belgium, 3 Luxembourg).</p>	
<p><u>Exposures and vulnerabilities</u></p> <p>The region is particularly exposed to risks of nuclear and radiological incidents (Tihange), as well as pandemics/epidemics (cross-border commuters, trade and Covid-19).</p>	
<p><u>Potential impact</u></p> <p>On both sides of the border, no risk is considered as a high impact risk. However, pandemics/epidemics, nuclear and radiological incidents, and cyber threats are considered average risks.</p>	
<p><u>Governance readiness and gaps</u></p> <p>There is strong governance readiness regarding flooding with multiple cross-border agreements, processes and tools available. Geohazards and technological risks are also covered by a cooperation agreement for crisis management, while specific tools and processes are in place for epidemics and pandemics. For other risks, the main mechanism for joint governance is the Benelux Union, a strong institution fostering cooperation, but the cross-border region lacks processes and agreements that are risk-specific.</p>	
<p><u>Availability/gaps of cross-border tools/agreements</u></p> <p>There is a lack of joint agreements for the risks of wildfires, biological hazards, cyber threats and migration. However, those risks are indirectly covered by agreements and tools that are not risk-specific.</p>	
<p><u>Recommendations</u></p> <p>Address Gaps in Risk Management Agreements:</p> <p>Establish specific risk management agreements between Belgium and Luxembourg, particularly for hazards such as wildfires, biological hazards, cyber threats, and migration. Develop cross-border protocols, processes, and tools tailored to address these risks effectively and ensure coordinated response efforts.</p> <p>Enhance Governance Structures:</p> <p>Strengthen the governance structures for risk management in the cross-border region by establishing risk-specific mechanisms and agreements. While in the Benelux there is a foundation for cooperation, there is a need for additional agreements and processes that focus on addressing specific hazards identified in the risk assessments.</p> <p>Improve Data Quality and Availability:</p> <p>Invest in improving the quality and availability of data related to disaster and risk management, especially in Luxembourg where data quality was found to be inadequate for most risks. Develop standardized data collection methods and enhance collaboration between relevant authorities to ensure accurate and reliable risk assessments.</p> <p>Focus on Cyber Threats:</p> <p>Given the high probability of cyber threats and the lack of specific risk management agreements in this area, prioritize efforts to address cyber security challenges in the cross-border region. Develop joint strategies, protocols, and response mechanisms to mitigate the impact of cyber-attacks and enhance the resilience of critical infrastructure and services.</p>	

BELGIUM – LUXEMBURG



Promote Cross-Border Collaboration:

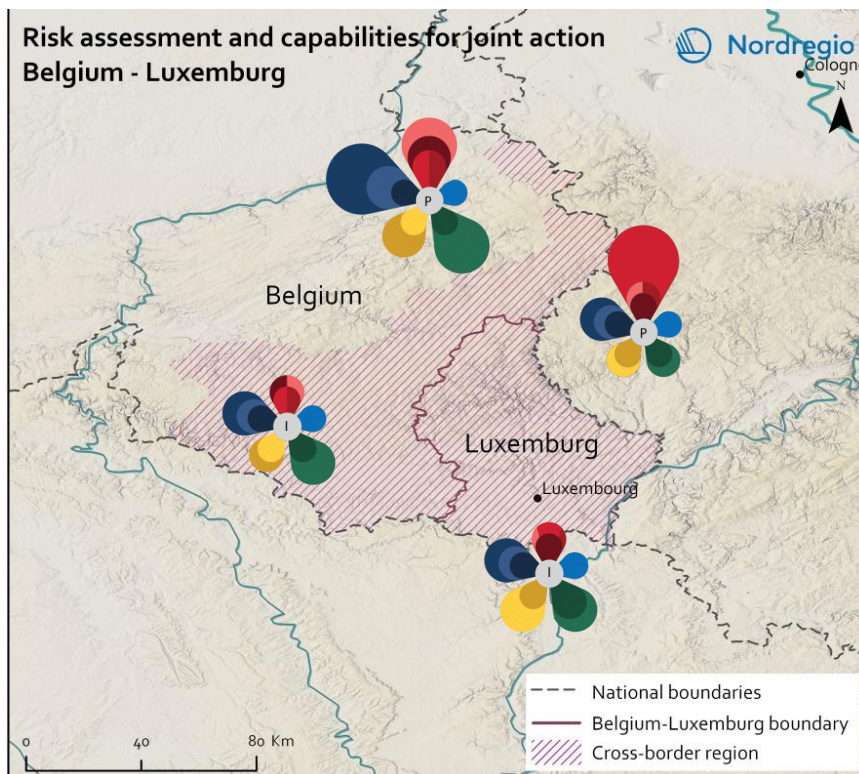
Facilitate collaboration and information-sharing between Belgium and Luxembourg on risk management initiatives. Encourage the exchange of best practices, lessons learned, and innovative solutions to strengthen disaster preparedness and response capabilities in the border region.

Ensure Risk-Specific Preparedness:

Develop risk-specific preparedness plans and measures to address the identified hazards, including pandemics/epidemics, nuclear and radiological incidents, and cyber threats. Conduct joint exercises and training programs to enhance the capacity of local authorities and emergency responders to effectively respond to emergencies and mitigate risks.

Data availability/quality and resulting impact on reliability of the assessment

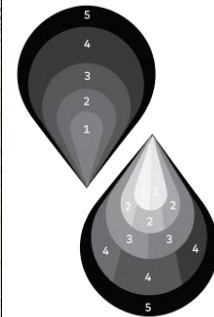
The data quality in Luxembourg was found to be inadequate for most risks, except for terrorism, flooding, and nuclear and radiological incidents. The Belgian National Risk Assessment does not evaluate wildfire and migration risks; alternative sources were used (Thinkhazard, EFFIS).



LEGEND

Each side of the petal represents a different risk level, with the smallest petal indicating a low risk level (1).

When risk groups have identical values, they are depicted within the same petal, segmented by the color associated with each risk group.




Probability (P):
1 - low
5 - high

Impact (I):
1 - low
5 - high

		Probability		Impact		Capability
		Belgium	Luxembourg	Belgium	Luxembourg	Average
Meteorological and hydrological	extreme weather	4	2	2.17	2	1
	flooding	2	5	1	2	2.5
	draught	2	2	1.33	2	2
	wild fire	3	1	1.83	1	0
Geohazards	geophysical risk	1	1	1	1	0.5
Biological	epidemics/pandemics	4	2	2.67	2.83	0.5
	animal & plant diseases	1	1	1	1.83	0
Technological	nuclear & radiological emergencies	1	2	1	3	1.5
	disruption of critical infrastructure	3	1	1.5	1	1
Societal	terrorism	3	2	2	2	0.5
	cyber threats	5	3	2.5	3	0
	migration	1	1	1	1	0

ORANGE: high probability (3 or higher) and low capability (1.5 or lower)
RED: high impact (3 or higher) and low capability (1.5 or lower)
DARK RED: low capability comes along with both high probability and high impact

Table 5 BELGIUM – NETHERLANDS

BELGIUM – NETHERLANDS	 
<p><u>Overall review of risks</u></p> <p>The following risks are scored as above average (in terms of probability) along the border: extreme weather (4 BE, 3 NL); flooding (5 BE, 3 NL); drought (4 BE, 4 NL); wildfires (4 BE, 5 NL); epidemics/pandemics (5 both); disruption of critical infrastructure (3 BE, 4 NL); cyberthreats (5 both).</p>	
<p><u>Discrepancies in risk assessment</u></p> <p>The risk assessment shows similarity between the two countries, except for flooding (5 Belgium, 3 Netherlands) and geophysical hazards (3 Belgium, 1 Netherlands).</p>	
<p><u>Exposures and vulnerabilities</u></p> <p>Production capacities, population, and infrastructure in the border region all face significant exposure to risks due to being highly urbanised and surrounded by several large cities, agglomerations, and industrial zones. The area is susceptible to meteorological and hydrological events, biological hazards, and disruptions to critical infrastructures.</p>	
<p><u>Potential impact</u></p> <p>On the Belgian side of the border, the most impactful hazards are floods and nuclear/radiological accidents. On the Netherlands side of the border, the primary risk is the disruption of critical infrastructure.</p>	
<p><u>Governance readiness and gaps</u></p> <p>The assessment of governance readiness is consistent on both sides of the border for all hazards. The primary mechanisms for joint governance include the Benelux Union, EMRIC and various cooperation agreements, including for mutual assistance. Most of these are not hazard-specific and encompass disaster response in general.</p>	
<p><u>Availability/gaps of cross-border tools/agreements</u></p> <p>With the exception of flooding, drought and critical infrastructure risks, the governance system presents significant gaps in terms of risk-specific disaster management agreement. Other risks are solely covered by general agreements for mutual assistance.</p>	
<p><u>Recommendations</u></p> <p>Address Gaps in Risk-Specific Agreements:</p> <p>Develop specific cross-border agreements and protocols to address high-probability risks such as wildfires, biological hazards, and cyber threats. While existing agreements cover hazards like extreme weather and flooding, additional agreements are needed to ensure comprehensive disaster management across all identified risks.</p> <p>Enhance Governance Structures:</p> <p>Strengthen the governance structures for risk management by establishing risk-specific mechanisms and agreements. While the Benelux Union and EMRIC provide a foundation for cooperation, efforts should be made to develop hazard-specific protocols and response mechanisms to address the unique challenges posed by different types of disasters.</p> <p>Promote Cross-Border Collaboration:</p> <p>Facilitate collaboration and information-sharing between Belgium and the Netherlands on risk management initiatives. Foster the exchange of best practices, lessons learned, and innovative solutions to enhance disaster preparedness and response capabilities in the border region.</p> <p>Improve Data Availability and Quality:</p> <p>Invest in improving the availability and quality of data related to disaster and risk management, particularly for risks not covered in national assessments such as wildfires and migration. Enhance collaboration between relevant authorities to ensure accurate and reliable risk assessments and support evidence-based decision-making.</p>	

BELGIUM – NETHERLANDS



Ensure Comprehensive Risk Assessment:

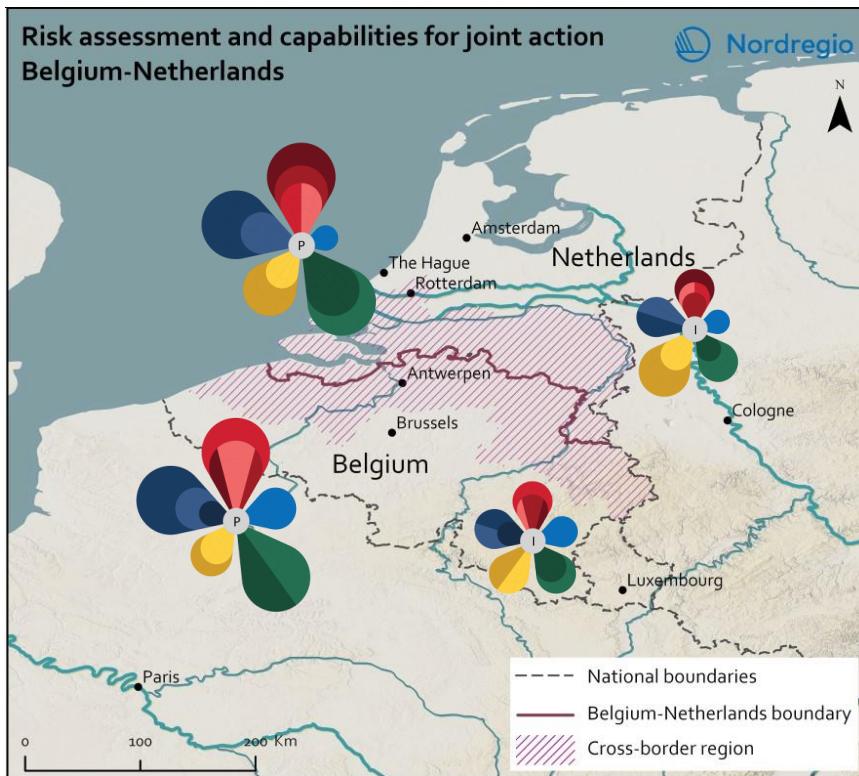
Conduct comprehensive risk assessments that take into account the specific vulnerabilities and exposures of the border region. This includes assessing the impact of hazards on production capacities, population, infrastructure, and critical facilities in urbanized areas and industrial zones along the border.

Develop Risk-Specific Preparedness Plans:

Develop risk-specific preparedness plans and measures to address the identified hazards, including wildfires, biological hazards, and cyber threats. Conduct joint exercises and training programs to enhance the capacity of local authorities and emergency responders to effectively respond to emergencies and mitigate risks.

Data availability/quality and resulting impact on reliability of the assessment

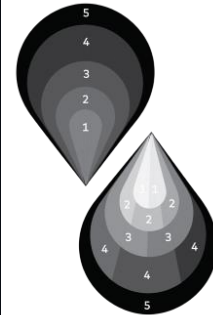
Wildfire and migration risks are not assessed in the Belgian National Risk Assessment – alternative sources were used (Thinkhazard, EFFIS).



LEGEND

Each side of the petal represents a different risk level, with the smallest petal indicating a low risk level (1).

When risk groups have identical values, they are depicted within the same petal, segmented by the color associated with each risk group.





Probability (P):
1 - low
5 - high

Impact (I):
1 - low
5 - high

ORANGE: high probability (3 or higher) and low capability (1.5 or lower)
RED: high impact (3 or higher) and low capability (1.5 or lower)
DARK RED: low capability comes along with both high probability and high impact

		Probability		Impact		Capability
		Belgium	Netherlands	Belgium	Netherlands	Average
Meteorological and hydrological	extreme weather	4	3	2.33	2.33	1
	flooding	5	3	3.33	2.33	3
	drought	4	4	1.67	1.33	2
	wild fire	4	5	2.17	3	1
Geohazards	geophysical risk	3	1	1.67	1	1
Biological	epidemics/pandemics	5	5	2.67	2.67	1
	animal & plant diseases	5	4	1.83	1.33	0
Technological	nuclear & radiological accidents	2	2	3.17	1.83	1
	disruption of critical infrastructure	3	4	2.67	4	2
Societal	terrorism	3	3	2.83	3	1
	cyber threats	5	5	2.5	3	0
	migration	1	-	1	-	0

Table 6 BULGARIA - GREECE

BULGARIA - GREECE	 
<p><u>Overall review of risks</u></p> <p>Epidemics/pandemics are regarded as the highest risks (5) on both sides of the border. Meteorological/hydrological/geophysical risks are assessed as above average, except for drought (2.5). Technological and societal risks, along with drought, have been assessed below average (< 3). The lowest probability is attributed to nuclear/radiological accidents and terrorism (1).</p>	
<p><u>Discrepancies in risk assessment</u></p> <p>There are slight discrepancies, with larger differences between: Geophysical risks (5 Bulgaria, 3 Greece), Cyber threats (1 Bulgaria, 3 Greece), Migration (3 Bulgaria, 1 Greece).</p>	
<p><u>Exposures and vulnerabilities</u></p> <p>According to the Bulgarian assessment on the Bulgarian side of the border, housing and infrastructure face exposure to flooding and wildfires, with production capacity being exposed to these risks to a lesser extent. All three—housing, infrastructure, and production capacity—are exposed to geophysical risks, with infrastructure facing the highest degree of exposure. The Greek assessment reveals similar findings, indicating that housing, production, and infrastructure are all vulnerable to flooding and wildfires, exceeding average levels of exposure. Additionally, all three are subject to geophysical risks, with housing having the highest exposure among them.</p>	
<p><u>Potential impact</u></p> <p>According to the Bulgarian and Greek assessment, flooding and wildfires have a significant impact on infrastructure, economic security, and the functional capacity of the population. While there is limited probability for drought, the potential economic impact is considered quite high in Bulgaria. On the Greek side, the most significant impact is attributed to geophysical events, particularly affected the functional capacity of the population and economic security.</p>	
<p><u>Governance readiness and gaps</u></p> <p>There are a few discrepancies between the two sides of the border. In general, both sides report low capability to address all risks, except for flooding (3 Bulgaria, 2 Greece) and nuclear/radiological accidents on the Bulgarian side (2). Nuclear/radiological accidents on the Greek side of the border are considered low (1).</p>	
<p><u>Availability/gaps of cross-border tools/agreements</u></p> <p>Many risks in the cross-border region lack agreements, risk assessments, processes, tools, institutions, or projects. The most comprehensive framework is related to flooding.</p>	
<p><u>Recommendations</u></p> <p>Strengthen Governance for Epidemic/Pandemic Preparedness:</p> <p>Given the high probability of epidemics/pandemics in the cross-border region and the inadequate governance readiness on both sides, there is a need to enhance mechanisms for sharing epidemiological data, disease surveillance information, and early warning alerts. Establish joint surveillance systems and develop standardized protocols and procedures for managing public health emergencies across borders.</p> <p>Enhance Governance for Floods, Wildfires, and Geophysical Risks:</p> <p>While governance readiness for floods is considered adequate, there are gaps in addressing wildfires and geophysical risks. Strengthen governance structures by conducting joint risk assessments and mapping exercises to identify high-risk areas. Develop protocols for early detection, rapid response, evacuation, and implement early warning systems and monitoring networks for wildfires and geophysical hazards along the border.</p> <p>Promote Cross-Border Cooperation:</p> <p>Foster collaboration between Bulgaria and Greece in disaster and risk management initiatives. Facilitate the exchange of best practices, lessons learned, and innovative solutions to enhance preparedness and response capabilities. Establish joint working groups or committees to coordinate efforts and address cross-border challenges.</p>	

BULGARIA - GREECE



Improve Data Availability and Quality:

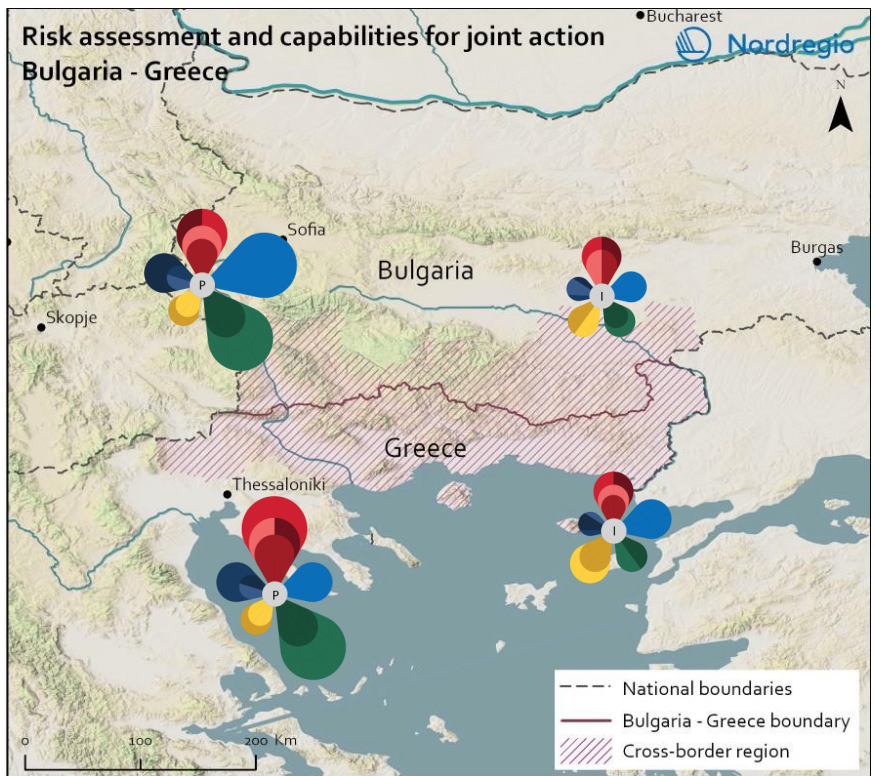
Invest in improving the availability and quality of data related to disaster and risk management in the border region. Enhance collaboration between relevant authorities to ensure accurate and reliable risk assessments. Incorporate comprehensive information on border regions into national risk assessments and disaster risk profiles.

Establish Coordination Mechanisms:

Establish formal coordination mechanisms between relevant agencies and stakeholders from both countries to ensure effective communication, information sharing, and joint decision-making during emergencies. Develop protocols for cross-border cooperation and mutual assistance in disaster response and recovery efforts.

Data availability/quality and resulting impact on reliability of the assessment

On the Bulgarian side, the national disaster risk profile and the technical annexes offer information, but there are gaps concerning the border regions. More comprehensive information on flooding is available in the respective river basin management plans. Data availability is assessed as medium for the Greek side of the border given that most of the risks have been assessed based on external sources and they are not included in the National Risk Assessment. Both countries are responsible for coordinating planning of measures in the cross-border region, although such information is incorporated into their respective RBMPs.



LEGEND

Each side of the petal represents a different risk level, with the smallest petal indicating a low risk level (1).

When risk groups have identical values, they are depicted within the same petal, segmented by the color associated with each risk group.

Probability (P):
 1 - low
 5 - high

Impact (I):
 1 - low
 5 - high



		Probability		Impact		Capability
		Bulgaria	Greece	Bulgaria	Greece	Average
Meteorological and hydrological	extreme weather	3	4	1.67	1.83	0
	flooding	4	5	2.83	2.83	2.5
	drought	2	3	1.5	1.33	0
	wild fire	4	4	2.5	2.67	1
Geohazards	geophysical risk	5	3	2	3	0.5
Biological	epidemics/pandemics	5	5	1.83	2	0
	animal & plant diseases	3	3	1.33	1.83	0
Technological	nuclear & radiological emergencies	1	1	2.33	2.5	1.5
	disruption of critical infrastructure	2	2	2.17	2.33	0
Societal	terrorism	1	1	1	1	0
	cyber threats	1	3	1	1.33	0
	migration	3	1	1.33	1	0.5

ORANGE: high probability (3 or higher) and low capability (1.5 or lower)

RED: high impact (3 or higher) and low capability (1.5 or lower)

DARK RED: low capability comes along with both high probability and high impact

Table 7 BULGARIA - NORTH MACEDONIA

BULGARIA - NORTH MACEDONIA	
	 
<u>Overall review of risks</u>	
The following hazards are considered more likely than average to occur: Wildfires; Geographical risks; Epidemics/pandemics.	
<u>Discrepancies in risk assessment</u>	
The risk profile is largely similar across the border, with the following exceptions:	
<ol style="list-style-type: none"> 1. Epidemics (5 Bulgaria, 2 North Macedonia) 2. Flooding (1 Bulgaria, 3 North Macedonia) 	
<u>Exposures and vulnerabilities</u>	
On the Bulgarian side of the border, production capacities and infrastructure face significant exposure to wildfires. Similarly, infrastructure is also exposed to geophysical risks, whereas housing and production capacity are exposed to this type of risk to a lesser extent.	
<u>Potential impact</u>	
According to the Bulgarian assessment on their side of the border, functional capacity is significantly impacted by extreme weather and epidemics/pandemics. Additionally, technological risks affect security of supply as well as international and EU activities.	
<u>Governance readiness and gaps</u>	
Governance readiness is consistently assessed across all hazards. There are, however, significant gaps in governance capabilities observed for all hazards except flooding and wildfires.	
<u>Availability/gaps of cross-border tools/agreements</u>	
A bilateral cooperation agreement exists for disaster management. Several cross-border projects under the INTERREG CBC/IPA Programme have been implemented to address flooding, focusing on governance aspects. Similarly, for forest fires, recognised as high risk, certain cross-border projects have enhanced governance and cooperation.	
However, the governance framework for specific risk types remains underdeveloped, necessitating efforts to address these gaps across all hazards. This is particularly crucial given the assessment of geohazards and epidemics/pandemics as high-probability risks. Further initiatives are necessary to strengthen coordination and capabilities on both sides of the border, for example by carrying out specific risk assessments, developing tools and processes, sharing of information, etc. Moreover, the risks of extreme weather and animal and plant diseases are assessed as average, suggesting the need for enhanced coordination and capabilities.	
<u>Recommendations</u>	
Address Governance Gaps:	
There are significant gaps in governance capabilities across all hazards except flooding and wildfires. Efforts should be made to strengthen governance frameworks for specific risk types. This includes conducting specific risk assessments, developing tools and processes, and improving information sharing between relevant authorities on both sides of the border.	
Enhance Cross-Border Cooperation:	
While bilateral cooperation agreements and certain cross-border projects exist, further initiatives are necessary to strengthen coordination and capabilities. Focus should be placed on developing joint strategies, protocols, and action plans to address high-probability risks such as geohazards and epidemics/pandemics. Promote collaboration through platforms like the INTERREG CBC/IPA Programme to address common challenges.	
Improve Data Availability and Quality:	
Enhance data collection and sharing mechanisms to ensure accurate and reliable risk assessments. Incorporate cross-border relevance into national disaster risk profiles and technical documents to better understand the regional context. Address data gaps concerning societal risks to ensure comprehensive risk assessments.	

BULGARIA - NORTH MACEDONIA



Enhance Preparedness for High-Risk Hazards:

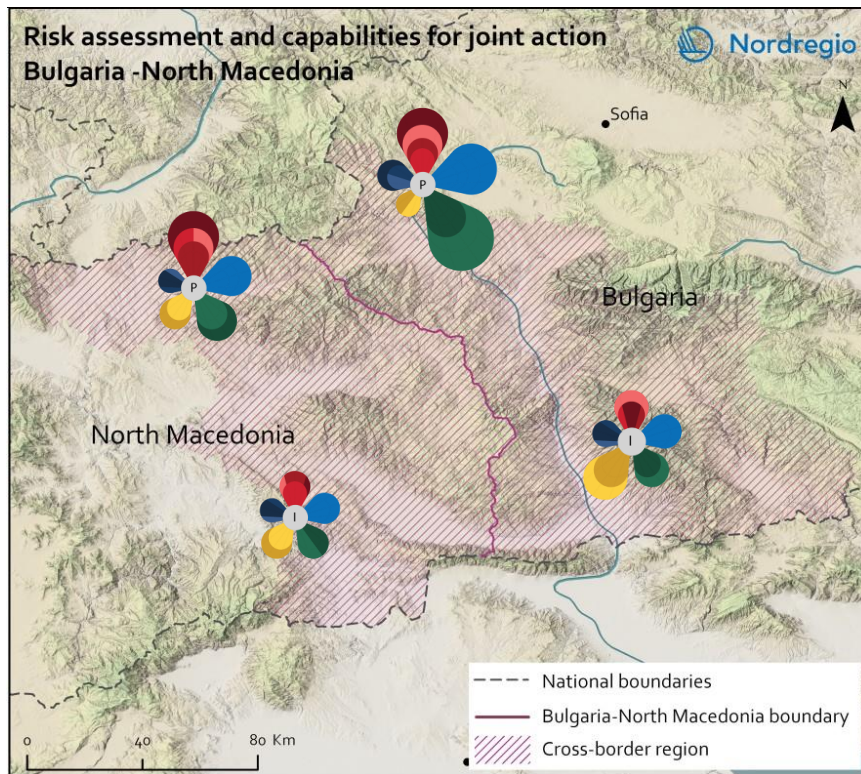
Given the high probability of wildfires, geohazards, and epidemics/pandemics, prioritize preparedness measures to mitigate their potential impacts. This may include developing early warning systems, conducting community awareness campaigns, and enhancing emergency response capabilities on both sides of the border.

Promote Capacity Building and Training:

Invest in capacity building and training programs to enhance the skills and knowledge of local authorities, emergency responders, and communities in disaster and risk management. Provide training on risk assessment methodologies, emergency response procedures, and coordination mechanisms to improve overall preparedness and response capabilities.

Data availability/quality and resulting impact on reliability of the assessment

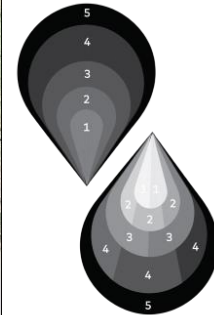
Regarding meteorological and hydrological risks, geohazards, biological, and technological risks, information is present in the National Disaster Risk Profile and respective technical aspects, but the cross-border relevance is not explicitly mentioned. Data gaps exist concerning societal risks. On the North Macedonian side of the border, information is more limited, although more details are available for meteorological and hydrological risks, as well as geohazards.



LEGEND

Each side of the petal represents a different risk level, with the smallest petal indicating a low risk level (1).

When risk groups have identical values, they are depicted within the same petal, segmented by the color associated with each risk group.





Probability (P):
1 - low
5 - high

Impact (I):
1 - low
5 - high

		Probability		Impact		Capability
		Bulgaria	Northern Macedonia	Bulgaria	Northern Macedonia	Average
Meteorological and hydrological	extreme weather	3	3	1.5	1.83	0
	flooding	1	3	1	1.17	3
	drought	2	2	1.33	2.17	0
	wild fires	4	4	1.33	2	3
Geohazards	geophysical risk	4	3	1.5	1.83	1
Biological	epidemics/pandemics	5	2	1.83	1.83	1
	animal & plant diseases	3	3	1.33	1.67	1
Technological	nuclear & radiological accidents	1	1	3.17	1.33	1
	disruption of critical infrastructure	1	2	2.17	2.33	1
Societal	terrorism	1	1	1	1	0
	cyber threats	1	1	1	1	0
	migration	2	1	1	1	1

ORANGE: high probability (3 or higher) and low capability (1.5 or lower)
RED: high impact (3 or higher) and low capability (1.5 or lower)
DARK RED: low capability comes along with both high probability and high impact

Table 8 BULGARIA - SERBIA

BULGARIA - SERBIA	
	 
<u>Overall review of risks</u>	
<p>Meteorological/Hydrological hazards are overall assessed as either average or high in the border, with few discrepancies. Technological and societal risks are assessed as either low or average across the border. The most relevant hazards (i.e. with an average above 3) are epidemics/pandemics (5), and wildfires (4).</p>	
<u>Discrepancies in risk assessment</u>	
<p>The expert assessment of risks is similar across the border, with few exceptions: Flooding (4 Bulgaria, 2 Serbia); Nuclear/radiological accidents (1 Bulgaria, 3 Serbia); Terrorism (2 Serbia, 1 Bulgaria).</p>	
<u>Exposures and vulnerabilities</u>	
<p>Serbia is vulnerable to extreme weather conditions, mostly to floods, droughts, and wildfires. As Serbia is part of the Western Balkan, which includes migration routes from Southern Europe to the Middle East, it is affected by migration. On the Bulgarian side, infrastructure is significantly exposed to flooding and production capacity is vulnerable to extreme weather.</p>	
<u>Potential impact</u>	
<p>Extreme weather risks for Serbia can have a significant impact on the economy, households, and production. On the Serbian side, other notable impacts include cyberattacks, epidemics, and pandemics. On the Bulgarian side, extreme weather and floods may impact the functional capacity of the population and services. Technological risks may also have an impact on the economy and the security of supply in international and EU activities.</p>	
<u>Governance readiness and gaps</u>	
<p>Governance readiness appears to be low on the Serbian side, with agreements available across hazards, but few other initiatives in place. On the Bulgarian side, governance readiness was assessed as generally low, with the exception of wildfires, flooding, and nuclear and radiological accidents. Bulgaria has developed relevant agreements, tools, and initiatives in these respective areas.</p>	
<u>Availability/gaps of cross-border tools/agreements</u>	
<p>At national level the governance framework is more developed with regards to the management of transboundary water bodies which also includes flood protection. As part of the related INTERREG-IPA Bulgaria – Serbia CBC Programme, projects on joint emergency interventions in the cross-border region dealt with addressing risk of floods, landslides and other natural and manmade disasters. In addition, projects under the IPA CBC programme have helped to develop joint training programmes and local joint intervention plans with regards to forest fire events.</p> <p>While an Agreement on cooperation in the field of protection against natural and man-made disasters has been established, there is a scarcity of tools or projects aimed at enhancing cooperation in the cross-border territory for managing a number of risks, for example epidemics/pandemics which is of high probability. With regards to extreme weather and drought, which are assessed as average, there is a lack of tools and processes. Migration poses an average risk, and while some steps, such as joint patrolling, have been taken to address migration pressure, further efforts are needed. Possible measures could be targeted at establishing a system and infrastructure for joint reactions and involvement in potential situations, information sharing, etc.</p>	
<u>Recommendations</u>	
Strengthen Governance Framework:	
<p>While some steps have been taken to establish governance frameworks for flood and forest fire risks, further efforts are needed to strengthen collaboration and coordination across all hazards. Develop joint training programs, intervention plans, and local response mechanisms to enhance preparedness and response capabilities on both sides of the border.</p>	
Enhance Cooperation for High-Probability Risks:	
<p>Focus on developing tools and projects aimed at enhancing cross-border cooperation for managing high-probability risks such as epidemics/pandemics, extreme weather, drought, and wildfires. Prioritize the establishment of joint early warning systems, intervention plans, and resource-sharing mechanisms to mitigate potential impacts.</p>	

BULGARIA - SERBIA



Address Data Gaps:

Improve data collection and sharing mechanisms to ensure accurate and reliable risk assessments in the cross-border region. Foster collaboration between relevant authorities to address data gaps and incorporate cross-border relevance into national risk assessments and disaster management plans.

Mitigate Epidemic/Pandemic Risks:

Given the high probability of epidemics/pandemics, conduct joint training exercises for healthcare professionals, share best practices in disease surveillance and control, and align public health policies to ensure a coordinated response to health emergencies. Strengthen cross-border cooperation in disease surveillance, information sharing, and resource allocation to effectively manage public health crises.

Improve Readiness for Meteorological and Hydrological Hazards:

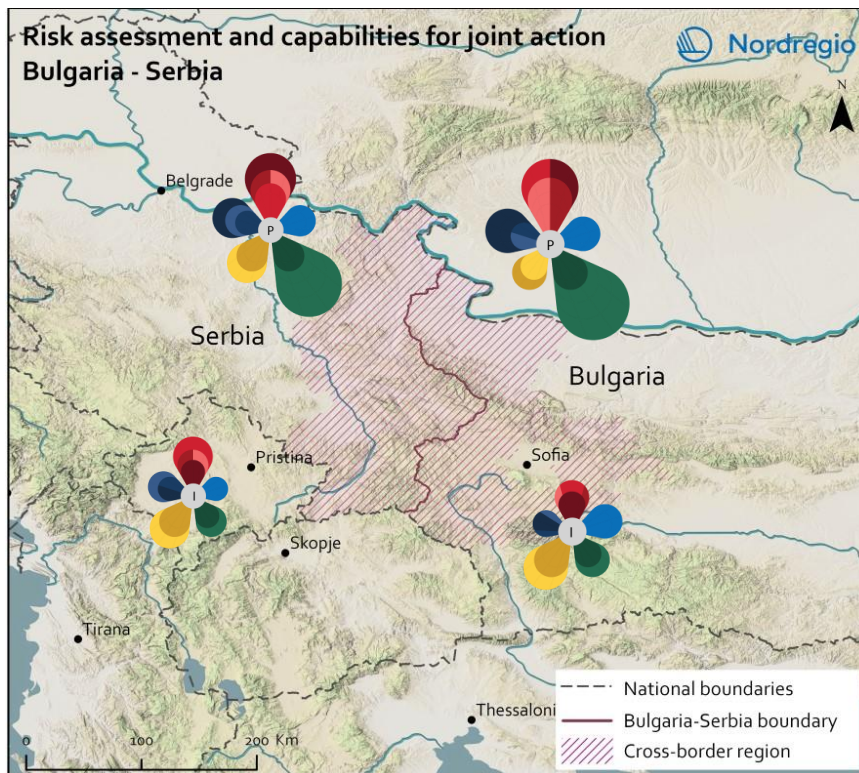
Implement joint early warning systems, formulate intervention plans, and foster resource-sharing mechanisms to mitigate the impacts of extreme weather, floods, and droughts. Enhance collaboration between meteorological agencies, emergency responders, and local communities to improve preparedness and response capabilities.

Enhance Cooperation on Migration:

While migration is assessed as an average risk, further collaborative efforts are needed to address migration pressures in the border region. Strengthen joint patrolling initiatives and establish systems for coordinated responses and information sharing to manage migration flows effectively.

Data availability/quality and resulting impact on reliability of the assessment

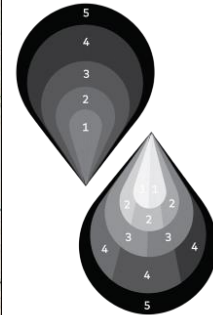
Data have been modest for potential risks, especially in cross-border region, reflecting the lack of bilateral agreements.



LEGEND

Each side of the petal represents a different risk level, with the smallest petal indicating a low risk level (1).

When risk groups have identical values, they are depicted within the same petal, segmented by the color associated with each risk group.





Probability (P):
1 - low
5 - high

Impact (I):
1 - low
5 - high

		Probability		Impact		Capability
		Bulgaria	Serbia	Bulgaria	Serbia	Average
Meteorological and hydrological	extreme weather	3	3	1.67	1.67	0.5
	flooding	4	2	1.83	3.17	2
	draught	3	3	1.5	1.67	0.5
	wild fires	4	4	1.33	1.33	2
Geohazards	geophysical risk	2	2	1.5	1.33	1
Biological	epidemics / pandemics	5	5	1.83	1.83	1
	animal & plant diseases	2	2	1.17	1.17	1
Technological	nuclear & radiological accidents	1	3	3.17	3.17	1.5
	disruption of critical infrastructure	2	2	2.17	2.17	1
Societal	terrorism	1	2	1	2	0.5
	cyber threats	1	1	1	1	1
	migration	3	3	1	1	1

ORANGE: high probability (3 or higher) and low capability (1.5 or lower)
RED: high impact (3 or higher) and low capability (1.5 or lower)
DARK RED: low capability comes along with both high probability and high impact

Table 9 CZECH REPUBLIC - AUSTRIA

CZECH REPUBLIC - AUSTRIA	
	 
<u>Overall review of risks</u>	
<p>The risk of flooding stands as the most pressing concern, rated at a very high level. This is followed by an average risk posed by wildfires and disruption of critical infrastructure. However, extreme weather, geophysical risks, and societal issues such as terrorism, cyber threats, and migration are regarded as low-risk factors.</p>	
<u>Discrepancies in risk assessment</u>	
<p>Most risks were similarly assessed, apart from the following: Wildfires (1 Czechia, 5 Austria); Drought (3 Czechia, 1 Austria); Epidemics / pandemics (3 Czechia, 1 Austria); Nuclear / radiological accidents (1 Czechia, 3 Austria).</p>	
<u>Exposures and vulnerabilities</u>	
<p>The Austrian risk assessment shows that meteorological and technological risks mostly expose production capacities, with housing to a lesser extent. The Czech risk assessment mainly points out drought, which exposes the agriculture and forestry sectors, as well as floods, which expose housing and the disruption of critical infrastructure.</p>	
<u>Potential impact</u>	
<p>On the Austrian side of the border, the economy/supply security, infrastructure, and international/EU activities would be impacted by meteorological and technological risks, as well as geohazards. On the Czech side, drought can mainly affect agriculture (production) and forestry (tree illnesses). The impact from nuclear accidents is substantial, but the probability is assessed as low.</p>	
<u>Governance readiness and gaps</u>	
<p>Regarding wildfires, there seems to be an opportunity for further strengthening governance readiness in the cross-border region. Likewise, further measures could be explored regarding cooperation for the management of the disruption of critical infrastructure, which appears to be relatively more prepared on the Czech side than on the Austrian side of the border. Increasing data information sharing, supporting knowledge transfer, aiding innovations and sustainable solutions, improving external communication and presentation, and supporting the collection and sharing of good practices across countries and borders are all crucial steps.</p> <p>The assessment on the Austrian border indicates low governance readiness for almost all risks, except for flooding (3) and disruption of critical infrastructure (2). The assessment on the Czech side of the border, on the other hand, shows higher capabilities to address risks for flooding, drought, epidemics/pandemics, nuclear/radiological accidents, and disruption of critical infrastructure.</p>	
<u>Availability/gaps of cross-border tools/agreement</u>	
<p>Tools such as INTERREG projects (DriDanube, Adapt region AT-CZ) have been identified for addressing various risks. However, gaps persist, particularly in improving data sharing. On the Austrian side of the border, no tools or agreements could be identified for geophysical, biological, meteorological risks (except flooding), and societal risks (except for cyber threats). One to two agreements were found for technological risks and cyber threats, and three for flooding. On the Czech side of the border, there is an Intersucho tool (best practice) focusing on problems related to drought and severe weather, primarily in the CZ/SK region, but with some products covering the entire EU.</p>	
<u>Recommendations</u>	
Focus on Flooding Preparedness:	
<p>Flooding is identified as the highest-risk hazard in the cross-border region. Both countries demonstrate a relatively high level of governance readiness to address flooding. Building on this, it's essential to continue strengthening flood preparedness measures, including early warning systems, infrastructure resilience, and community awareness programs.</p>	
Address Discrepancies in Risk Assessment:	
<p>Discrepancies in risk assessments, particularly regarding wildfires, drought, epidemics/pandemics, and nuclear/radiological accidents, should be addressed through improved data sharing, harmonization of</p>	

CZECH REPUBLIC - AUSTRIA



methodologies, and joint risk assessment exercises. This will ensure a more comprehensive understanding of shared risks and facilitate coordinated response efforts.

Enhance Cooperation for Wildfire Management:

Given the significant discrepancy in wildfire risk assessment between the Czech Republic and Austria, there is an opportunity to enhance cross-border cooperation for wildfire management. This may involve joint training exercises, sharing best practices, and developing standardized protocols for wildfire response and prevention.

Strengthen Governance Readiness for Critical Infrastructure Disruption:

While the Czech Republic demonstrates relatively higher readiness for managing the disruption of critical infrastructure compared to Austria, further measures should be explored to enhance cross-border cooperation in this area. This may include joint risk assessments, development of contingency plans, and investment in infrastructure resilience measures.

Improve Data Sharing and Collaboration:

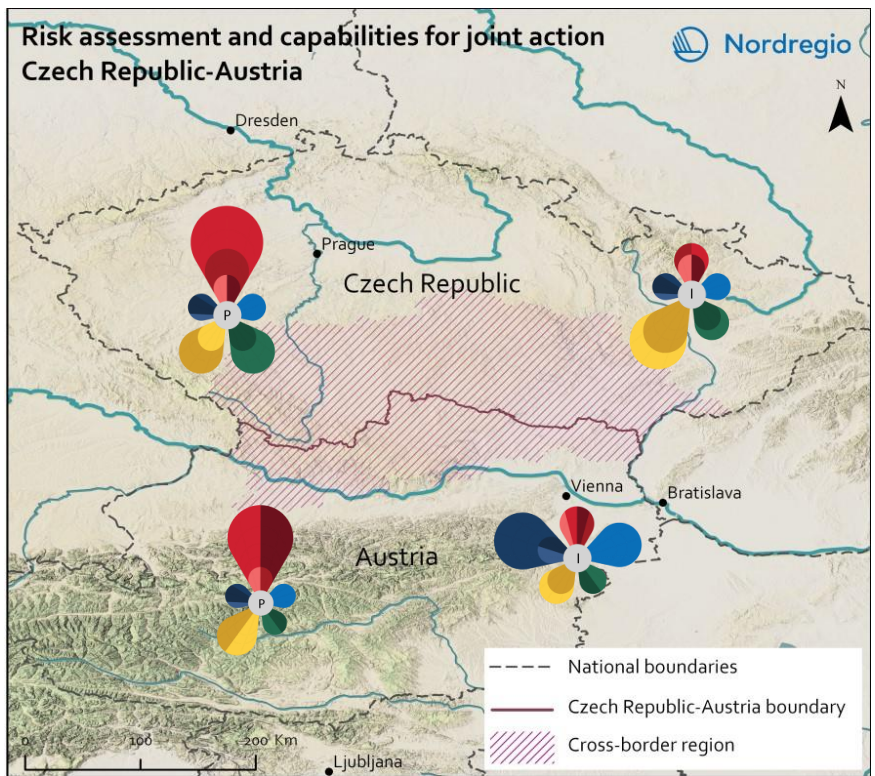
Enhancing data sharing mechanisms and collaboration platforms will be crucial for improving the reliability of risk assessments and facilitating cross-border cooperation. Efforts should focus on improving data availability, harmonizing data standards, and establishing information-sharing protocols for relevant stakeholders.

Utilize Existing Tools and Agreements:

Leverage existing tools and agreements, such as INTERREG projects and bilateral agreements, to enhance cross-border cooperation in disaster risk management. Identify gaps in existing frameworks and explore opportunities for developing new tools or agreements to address specific risks identified in the border region.

Data availability/quality and resulting impact on reliability of the assessment

Data availability and quality are assessed as medium to high for the Austrian side of the border, with six agreements found and the ability to assess most risks based on external sources. Data availability connected to drought, flood, and climate is assessed as high. However, there is a challenge in assessing data connected with illegal migration.



		Probability		Impact		Capability
		Czech Republic	Austria	Czech Republic	Austria	Average
Meteorological and hydrological	extreme weather	1	1	1	2	0.5
	flooding	5	5	2.33	2	3
	drought	3	1	2	1.83	1.5
	wild fire	1	5	1	1.83	0.5
Geohazards	geophysical risk	1	1	1	2.67	0.5
Biological	epidemics / pandemics	3	1	2.33	1	1.5
	animal & plant diseases	1	1	1	1	0.5
Technological	nuclear & radiological accidents	1	3	3.67	2.33	2
	disruption of critical infrastructure	3	3	3.33	0.83	2.5
Societal	terrorism	1	1	1	1	0.5
	cyber threats	1	1	1	3.67	1
	migration	1	1	1	1	0.5

ORANGE: high probability (3 or higher) and low capability (1.5 or lower)
RED: high impact (3 or higher) and low capability (1.5 or lower)
DARK RED: low capability comes along with both high probability and high impact

Table 10 CZECH REPUBLIC -SLOVAKIA

CZECH REPUBLIC -SLOVAKIA	
<u>Overall review of risks</u>	<p>For both sides of the border, flooding is assessed as a high risk (5), and disruption of critical infrastructure is considered a medium risk (3). Drought has also been assessed with an average probability/likelihood, but there is a discrepancy between the two borders. The least likely risks to occur are wildfires and geophysical risks, assessed at 0.5, followed by terrorism (1), and animal/plant diseases (1.5).</p>
<u>Discrepancies in risk assessment</u>	<p>There are discrepancies in several of the risks assessed: drought (1 Czechia, 5 Slovakia); animal and plant diseases (0 Czechia, 3 Slovakia); cyber threats (1 Czechia, 4 Slovakia); migration (1 Czechia, 4 Slovakia); epidemics/pandemics (1 Czechia, 3 Slovakia).</p>
<u>Exposures and vulnerabilities</u>	<p>The Czech and Slovak risk assessments indicate that drought risk mostly exposes the agriculture and forestry sectors. Floods cause disturbances in critical infrastructures, such as flooded roads. The current migration crisis also highlights that the security of the border region is highly affected by migration criminality. Animal and plant diseases can expose the border forest area to issues such as invasive plants.</p>
<u>Potential impact</u>	<p>The governance level is assessed as high for some risks and low for others on the Czech side. A similar assessment can be observed for the Slovakian border, although with a few discrepancies.</p>
<u>Governance readiness and gaps</u>	<p>To enhance collaboration, there should be an increase in sharing data information, support for knowledge transfer, and assistance for innovations and sustainable solutions. Additionally, efforts should focus on improving external communication and presentation. Clear and understandable documentation of the current legal analysis (EU and National policy) in the As-Is context is essential. The design of the target To-Be status, extending from the strategic to the implementation level, should involve the identification of relevant gaps. Establishing synergies within the legal framework is crucial, especially in connecting Disaster risk legislation with other pertinent domains such as environment, ICT, and eGov legal framework. Lastly, it is important to support the collection and sharing of good practices across countries and borders.</p>
<u>Availability/gaps of cross-border tools/agreements</u>	<p>Tools:</p> <ul style="list-style-type: none">• INSPIRE/NSDI ESPUS trainings (https://drive.geocloud.sk/s/2yDQffi8HAz8tkC) for the crisis management)• INTERREG projects• Visegrad group• Intersucho service• Spatial data registry / National Geoportal – Civil protection• European Geoportal <p>However, several gaps need attention for a more comprehensive approach. There is a shortage of skilled capacities in the domain, ICT, and communication, hindering effective crisis management. The absence of robust data availability and sharing mechanisms across domains poses a challenge. Furthermore, the lack of services for data sharing and a limited number of applications/websites providing support for involved stakeholders need to be addressed to strengthen crisis management infrastructure and capabilities.</p>
<u>Recommendations</u>	<p>Address Discrepancies in Risk Assessment:</p> <p>Discrepancies in risk assessments, particularly regarding drought, animal and plant diseases, cyber threats, migration, and epidemics/pandemics, should be addressed through improved data sharing, harmonization of methodologies, and joint risk assessment exercises. This will ensure a more comprehensive understanding of shared risks and facilitate coordinated response efforts.</p> <p>Enhance Collaboration and Governance Readiness:</p> <p>Efforts should be focused on enhancing collaboration and governance readiness across both sides of the border. This includes increasing data sharing, supporting knowledge transfer, and improving external</p>

CZECH REPUBLIC -SLOVAKIA



communication and presentation. Clear documentation of legal frameworks and identification of gaps will help in establishing synergies within the legal framework.

Utilize Existing Tools and Agreements:

Leverage existing tools and agreements, such as INTERREG projects, the Visegrad group, and the Intersucho service, to enhance cross-border cooperation in disaster risk management. Identify gaps in existing frameworks and explore opportunities for developing new tools or agreements to address specific risks identified in the border region.

Combat Illegal Migration:

Address the challenge of combating criminal activities related to illegal migration across the border. This area requires focused attention and coordinated efforts between relevant stakeholders to strengthen overall risk management infrastructure and improve border security.

Improve Data Availability and Quality:

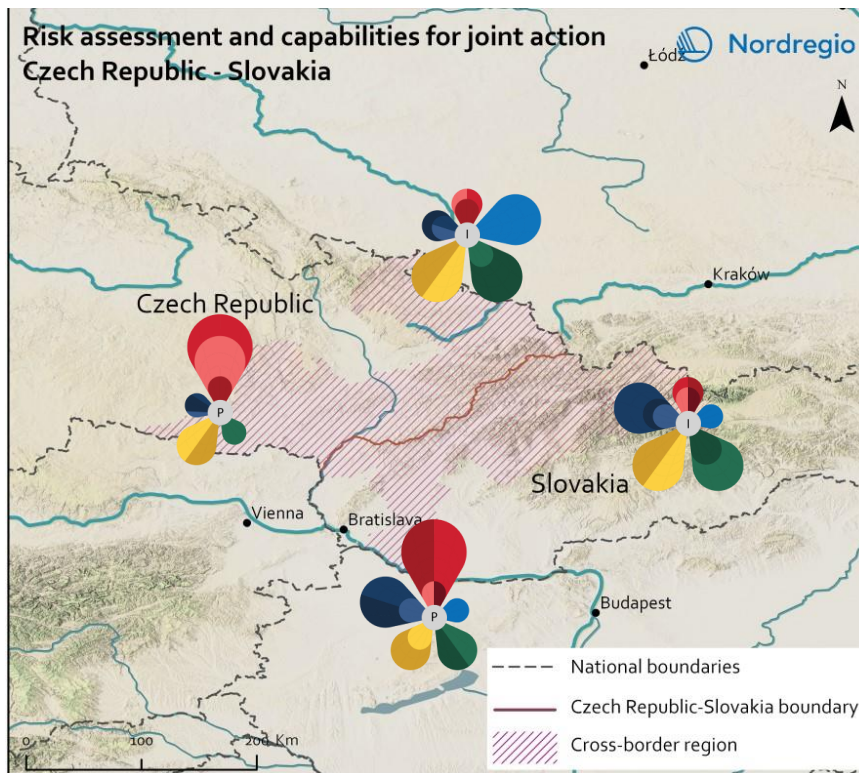
Enhance data availability and quality, particularly in areas related to illegal migration, to support more effective management of migration-related challenges. This may involve improving data sharing mechanisms, enhancing data collection efforts, and establishing robust data infrastructure.

Invest in Capacity Building:

Invest in capacity building initiatives to enhance skills and capabilities in disaster risk management, ICT, communication, and crisis management. This will help in building a more resilient border region and improving response capabilities to various hazards and challenges.

Data availability/quality and resulting impact on reliability of the assessment

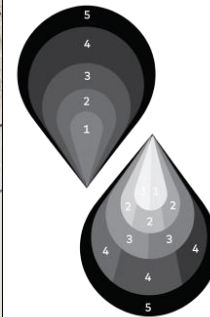
Data availability for drought, floods, and severe weather is assessed as very good (4), thanks to tools such as Intersucho, INTERREG, and the Visegrad group, as well as the connection between Czech and Slovak Hydro-metric services with no language barrier. However, a notable issue exists in terms of data availability that could be beneficial in addressing illegal migration. This area requires attention to enhance the availability of relevant data for more effective management of migration-related challenges.



LEGEND

Each side of the petal represents a different risk level, with the smallest petal indicating a low risk level (1).

When risk groups have identical values, they are depicted within the same petal, segmented by the color associated with each risk group.



Probability (P):
1 - low
5 - high

Impact (I):
1 - low
5 - high

		Probability		Impact		Capability
		Czech Republic	Slovakia	Czech Republic	Slovakia	Average
Meteorological and hydrological	extreme weather	4	1	2	1	2
	flooding	5	5	1.67	2.17	3
	drought	1	5	1	1.83	2
	wild fire	-	1	-	1	0.5
Geohazards	geophysical risk	-	1	3.67	1	0.5
Biological	epidemics/pandemics	1	3	1	3.67	2
	animal & plant diseases	-	3	3.5	1.5	1.5
Technological	nuclear & radiological accidents	3	1	4	3.83	3
	disruption of critical infrastructure	3	3	4	4.33	3
Societal	terrorism	1	1	1	1	1
	cyber threats	1	4	1	3.83	1
	migration	1	4	1.67	1.67	2

ORANGE: high probability (3 or higher) and low capability (1.5 or lower)

RED: high impact (3 or higher) and low capability (1.5 or lower)

DARK RED: low capability comes along with both high probability and high impact

Table 11 SLOVAKIA - AUSTRIA

SLOVAKIA - AUSTRIA	
<u>Overall review of risks</u>	The following hazards are considered more likely than average to occur: Flooding (4.5); Drought (4.5); Disruption of critical infrastructure (3); Migration (4.5).
<u>Discrepancies in risk assessment</u>	The probabilities for flooding and drought have been assessed slightly higher in Austria (5), against 4 in Slovakia. All other risks have been assessed similarly.
<u>Exposures and vulnerabilities</u>	Slovakia's risk assessment indicates that flooding primarily exposes road infrastructure and housing, but it can also affect agriculture. Drought mainly impacts the agricultural sector. Disruption of critical infrastructure affects production capacities, housing, and critical infrastructure. Additionally, migration poses a threat to security in border regions.
<u>Potential impact</u>	The impacts of floods vary depending on their magnitude, ranging from flooded streets to potentially flooded cities such as Bratislava. Drought exerts a significant impact on agriculture, production capacities, and water supply. Disruption of critical infrastructure, including effects on gas and crude oil for industry and water for housing, can have widespread consequences. Migration, on the other hand, influences criminality in the border regions, adding a layer of complexity to security concerns.
<u>Governance readiness and gaps</u>	The governance readiness for floods is at a high level. However, there is room for improvement in addressing droughts, particularly in the need for drought mitigation tools. Regarding the disruption of critical infrastructure, there are multiple agreements in place, indicating a certain level of preparedness. Migration emerges as a pressing and current theme, with Slovakian and Austrian police forces actively renewing border controls in an effort to maintain control over migration. Despite these efforts, there remains a substantial number of migrants who continue to illegally cross the border, posing ongoing challenges.
<u>Availability/gaps of cross-border tools/agreements</u>	Various tools are in place to address different risks. For floods, there are regulations for the Danube River, initiatives on the Morava River, and bilateral agreements on early warning and cross-border assistance. Regarding drought, there are multiple INTERREG initiatives in place. To manage the disruption of critical infrastructures, there are bilateral agreements and contracts for the supply of critical infrastructures. For migration, tools include bilateral agreements and police cooperation. However, certain gaps have been identified. For drought, there is a need to improve the data-sharing process. Regarding migration, there is a need to enhance cooperation and minimize the flow of migration.
<u>Recommendations</u>	<p>Enhance Data Sharing and Information Exchange:</p> <p>Establish a common platform or mechanism for sharing data related to drought, migration, and other key risks between Slovakia and Austria.</p> <p>Implement interoperable systems and protocols to facilitate seamless data exchange among relevant agencies and stakeholders.</p> <p>Promote the use of standardized formats and protocols to improve the compatibility and usability of shared data.</p> <p>Strengthen Early Warning Systems:</p> <p>Invest in the development and enhancement of early warning systems for floods, droughts, and other hazards affecting the border region.</p> <p>Ensure that early warning systems are comprehensive, timely, and accessible to all stakeholders, including local communities, emergency responders, and decision-makers.</p> <p>Conduct regular drills and exercises to test the effectiveness of early warning systems and improve response readiness.</p>

SLOVAKIA - AUSTRIA



Invest in Infrastructure Resilience:

Identify and prioritize critical infrastructure assets that are vulnerable to natural disasters, cyber threats, and other hazards.

Implement measures to enhance the resilience of infrastructure systems, including retrofitting, reinforcement, and redundancy measures.

Incorporate risk-informed decision-making into infrastructure planning, design, and maintenance practices to minimize vulnerabilities and enhance adaptive capacity.

Promote Community Engagement and Awareness:

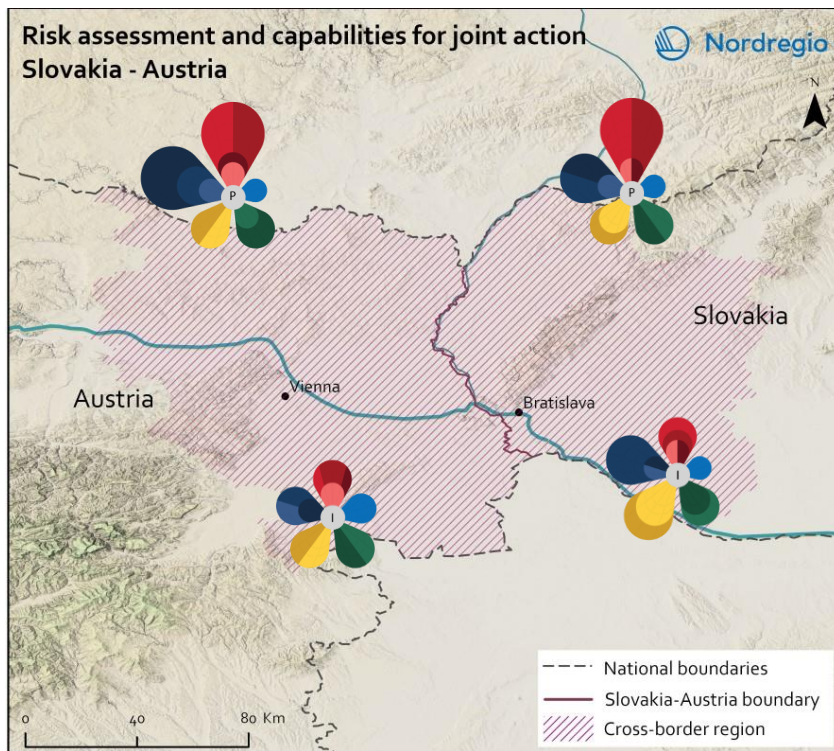
Empower local communities through awareness campaigns, training programs, and capacity-building initiatives on disaster preparedness, response, and recovery.

Foster community participation in risk assessment, planning, and decision-making processes to ensure inclusivity and resilience.

Encourage the establishment of community-based early warning systems and volunteer networks to enhance local resilience and response capabilities.

Data availability/quality and resulting impact on reliability of the assessment (1 low – 5 very good)

Flooding is rated at 5, indicating a high level of data reliability. For drought, a rating of 3 suggests that data availability could be enhanced with the implementation of the Intersucho drought monitoring service, necessitating action from the Austrian side. Similarly, the disruption of critical infrastructure is also rated at 3, emphasizing the need for a common platform to facilitate data sharing. In the case of migration, a rating of 3 signifies the potential for improvement in data availability, especially concerning instances of many migrants still illegally crossing the border.



LEGEND

Each side of the petal represents a different risk level, with the smallest petal indicating a low risk level (1).

When risk groups have identical values, they are depicted within the same petal, segmented by the color associated with each risk group.





Probability (P):
1 - low
5 - high

Impact (I):
1 - low
5 - high

		Probability		Impact		Capability
		Slovakia	Austria	Slovakia	Austria	Average
Meteorological and hydrological	extreme weather	1	1	1	1	1
	flooding	5	5	2.5-	2.5	3
	drought	5	5	1.67	2.67	2
	wild fires	1	2	1	2.5	1
Geohazards	geophysical risk	1	1	1	2.33	1
Biological	epidemics / pandemics	3	1	3.17	3.17	2
	animal & plant diseases	3	3	1.5	2.5	1.5
Technological	nuclear / radiological accidents	2	3	3.33	2.5	2
	disruption of critical infrastructure	3	3	3.5	3.33	2
Societal	terrorism	1	1	1	2.83	1
	cyber threats	4	3	3.5	2.5	1.5
	migration	4	5	1.33	1	2

ORANGE: high probability (3 or higher) and low capability (1.5 or lower)
RED: high impact (3 or higher) and low capability (1.5 or lower)
DARK RED: low capability comes along with both high probability and high impact

Table 12 SLOVAKIA - HUNGARY

SLOVAKIA - HUNGARY	
	 
<u>Overall review of risks</u>	
<p>The following hazards are considered more likely than average to occur: flooding (5); drought (5); epidemics (4); animal and plant diseases (4); cyber threats (4.5); and mass migration (4).</p>	
<u>Discrepancies in risk assessment</u>	
<p>There are discrepancies in the risk assessment, particularly regarding animal and plant diseases. The risk is rated as very highly probable on the Hungarian side of the border, whereas it is rated as of average probability on the Slovakian side.</p>	
<u>Exposures and vulnerabilities</u>	
<p>The Slovak Nuclear Regulatory Authority's safety assessment indicates that nuclear and radiological accidents have a substantial negative effect on each sector, with three nuclear power plants near the Slovak-Hungarian border (Jaslovské Bohunice, Mochovce, and Paks in Hungary). The sector most affected depends on the size and type of the accident, including soil contamination, spread of a radioactive cloud, or decommissioning of a nuclear power plant from the electricity grid. The National Office for the Regulation of Network Industries highlights that disruptions in gas and crude oil supply would have a destructive effect on housing, production companies, and infrastructure, especially during the winter months when most Slovakian facilities use gas for heating. Additionally, Slovakia has direct cross-border connections with the electricity systems of neighbouring countries. Regarding cybersecurity, Slovakia's National Cyber Security Strategy 2021 to 2025 emphasizes that as IT technologies are used in each sector, an attack on the IT sector would negatively affect all industries and non-industrial sectors. Regarding migration, the Slovak Republic's migration policy until 2025 addresses recent migration crises from the Middle East.</p> <p>As regards the Hungarian side of the border, extreme weather poses a significant risk to housing, major infrastructure (such as border bridges), and agriculture, particularly from floods and droughts. Flooding is highly likely due to bordering rivers and streams in hilly areas, which can severely damage low-quality housing and adobe houses. Droughts can cause extensive agricultural damage, especially in regions distant from major rivers. The presence of forests and meadows in neighbouring regions increases the risk of wildfires, particularly dangerous for forestry and wildlife reserves. Landslides are also a possibility according to the geophysical risk map. The high number of cross-border commuters increases the likelihood of epidemic transmission. Animal migration, such as that of wild boars, leads to the regular occurrence of animal diseases like swine fever. While the chance of a nuclear accident is very low, the impact would be high due to the proximity of several nuclear power plants. Major floods, which happen regularly along the bordering rivers, can disrupt and damage agriculture, housing, and infrastructure. The Danube, in particular, is vital for European infrastructure for goods and tourism, including its bridges between Hungary and Slovakia. While there is no evidence of any terroristic attacks, the presence of strategic bridges increases the possibility of threats. No mass migration movements were found.</p>	
<u>Potential impact</u>	
<p>Extreme weather, including storms and extreme wind, impacts housing. Flooding affects both housing and agriculture, particularly evident in multiple floods in the SK–HU cross-border region. Drought affects agricultural production, forestry, and water supply. Epidemics impact the functional capacity of the population and services. Animal and plant diseases impact the economy and security of supply. Cyber-threats and migration impact internal security.</p>	
<u>Governance readiness and gaps</u>	
<ul style="list-style-type: none"> • Extreme weather: bilateral agreement and initiatives (2) • Flooding: multiple bilateral agreements and initiatives, comprehensive approach (3) • Drought: multiple bilateral agreements and initiatives, comprehensive approach (3) • Epidemics: bilateral agreements and initiatives (2) • Animal and plant diseases: bilateral agreements and initiatives (2) • Cyber threats: bilateral agreements and initiative (2) • Migration: bilateral agreements and initiatives, police cooperation, comprehensive approach (3) 	

SLOVAKIA - HUNGARY



Availability/gaps of cross-border tools/agreements

Tools:

- Extreme weather: INTERREG initiatives in the Danube region, early warning
- Flooding: INTERREG initiatives, synchronization on the Danube River water structures manipulation, early warning
- Drought: INTERREG initiatives in the Danube region
- Epidemics: INTERREG initiatives, medical centre cooperation during COVID-19
- Animal and plant diseases: Initiatives and early warning system
- Cyber threats: initiatives
- Migration: police cooperation, early warning

Gaps:

- Flooding: cooperation on cross border projects (Nagymaros water structure)
- Drought: cooperation on the drought monitoring initiative Intersucho
- Epidemics: better preparedness for the epidemic situations
- Migration: improve the cooperation of the police and military forces.

Recommendations

Improve Climate-Connected Data Sharing:

Develop and implement data sharing tools and platforms specifically focused on climate-related hazards such as extreme weather, flooding, and drought.

Establish standardized protocols and formats for data sharing to enhance interoperability and accessibility among relevant stakeholders.

Strengthen collaboration between meteorological agencies, research institutions, and governmental organizations to improve the collection, analysis, and dissemination of climate-related data.

Enhance Cooperation in Flood Risk Management:

Address existing gaps in cross-border cooperation on flood risk management, particularly concerning joint projects such as the Nagymaros water structure.

Facilitate information exchange and joint planning initiatives to enhance flood resilience and response capabilities along the Slovakia-Hungary border.

Strengthen collaboration between water management authorities, emergency responders, and local communities to develop and implement effective flood mitigation strategies.

Promote Collaboration in Drought Monitoring and Management:

Enhance cooperation on drought monitoring initiatives such as Intersucho to improve data availability and early warning capabilities.

Foster cross-border partnerships and information sharing mechanisms to address common challenges related to agricultural drought, water scarcity, and ecosystem resilience.

Support the development of joint drought response plans and adaptive measures to mitigate the socio-economic impacts of drought events on both sides of the border.

Enhance Preparedness for Epidemic Situations:

Strengthen bilateral agreements and coordination mechanisms for epidemic preparedness and response, building on lessons learned from the COVID-19 pandemic.

Enhance capacity building and training programs for healthcare professionals, emergency responders, and public health authorities to effectively manage epidemic situations.

Improve communication and information sharing channels to facilitate rapid and coordinated responses to emerging infectious disease threats along the Slovakia-Hungary border.

Improve Collaboration on Cyber Threats and Migration:

Enhance cooperation between law enforcement agencies, cybersecurity experts, and relevant government bodies to address cyber threats and ensure the security of critical infrastructure.

Strengthen police and military cooperation to improve border security and minimize the flow of illegal migration across the Slovakia-Hungary border.

SLOVAKIA - HUNGARY



Implement joint initiatives and information sharing mechanisms to enhance situational awareness and response capabilities in addressing cybercrime and migration-related challenges.

Invest in Data Sharing Infrastructure:

Develop and implement platforms for data sharing and information exchange on cyber threats, migration patterns, and other security-related issues.

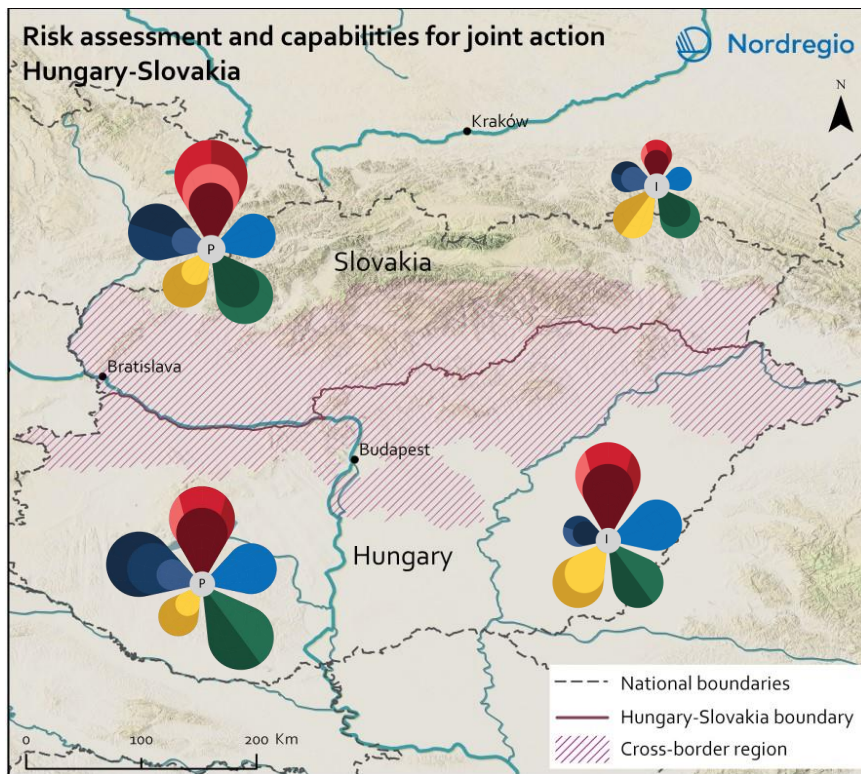
Invest in the development of interoperable data sharing infrastructure to facilitate seamless collaboration and decision-making among relevant stakeholders.

Promote the adoption of advanced technologies such as data analytics, artificial intelligence, and machine learning to enhance the analysis and interpretation of shared data for risk management purposes.

Data availability/quality and resulting impact on reliability of the assessment

Data availability (1 low -5 very good):

- Extreme weather (3) - the data availability can be improved (missing of the platform for the data sharing)
- Flooding (5)
- Drought (3) - the data availability can be improved (missing of the platform for the data sharing)
- Epidemics (5)
- Animal and plant diseases (5)
- Cyber threats (3) - the data availability can be improved (missing of the platform for the data sharing)
- Migration (4) - the data availability can be improved (still a multiple migrant illegally cross the border)



LEGEND

Each side of the petal represents a different risk level, with the smallest petal indicating a low risk level (1).

When risk groups have identical values, they are depicted within the same petal, segmented by the color associated with each risk group.





Probability (P):
1 - low
5 - high

Impact (I):
1 - low
5 - high

		Probability		Impact		Capability
		Slovakia	Hungary	Slovakia	Hungary	Average
Meteorological and hydrological	extreme weather	4	5	1.67	4.67	2
	flooding	5	5	2.33	4.67	3
	drought	5	5	1.83	4.5	3
	wild fire	3	4	1	3.5	2
Geohazards	geophysical risk	3	4	1	4	2
Biological	epidemics/pandemics	4	5	2.83	4.33	2.5
	animal & plant diseases	3	5	1.67	3.83	2.5
Technological	nuclear & radiological emergencies	1	1	3	3	3
	disruption of critical infrastructure	3	3	3.33	3.83	3
Societal	terrorism	1	2	1	2	2
	cyber threats	4	5	1.67	1.5	2.5
	migration	4	4	1.5	1	3

ORANGE: high probability (3 or higher) and low capability (1.5 or lower)
RED: high impact (3 or higher) and low capability (1.5 or lower)
DARK RED: low capability comes along with both high probability and high impact

Table 13 GERMANY - AUSTRIA

GERMANY - AUSTRIA	
	 
<u>Overall review of risks</u>	
<p>Flooding and Extreme weather are considered more likely than average to occur. Data is incomplete for Terrorism and Cyber Threats (missing for Austria). However, they are both considered as more likely than average in Germany.</p>	
<u>Discrepancies in risk assessment</u>	
<p>There are some significant disparities in the risk assessment across border. In the case of extreme weather, Germany assessed the hazard as very likely (score 5) compared to 2 for Austria. In the case of Drought, the score of the former was 4, whereas that of the latter was 1. In the case of wildfires Germany has a score of 1, against a score of 3 in Austria. The opposite pattern emerges in Animal and Plant Diseases.</p>	
<u>Exposures and vulnerabilities</u>	
<p>The Austrian assessment shows that flooding, wildfires, landslides, and avalanches mostly expose production capacities and housing to a lesser extent. On the German side, residential areas are also considered to be at risk.</p>	
<u>Potential impact</u>	
<p>On the Austrian side of the border, meteorological, technological, and geophysical risks would mainly impact the economy/ supply security, infrastructure and international/ EU activities. On the German side, increased risks are seen in relation to terrorism and cyber threats as well as geophysical disasters.</p>	
<u>Governance readiness and gaps</u>	
<p>Governance readiness is low except for Flooding and Wildfires, for which both sides of the border register a set of initiatives and agreements.</p>	
<u>Availability/gaps of cross-border tools/agreements</u>	
<p>From the Austrian side of the border, at least 1 agreement was found for each risk. For flooding and wildfires, an agreement and 1 or more tools/ processes were found but there is room for improvement.</p>	
<u>Recommendations</u>	
<p>Enhance Collaboration and Information Sharing:</p> <p>Establish a bilateral mechanism or platform for sharing risk assessment data, best practices, and lessons learned between Germany and Austria to address discrepancies in risk assessments.</p> <p>Foster cross-border cooperation in conducting joint risk assessments, especially for hazards like extreme weather, drought, wildfires, and geophysical risks, to ensure a comprehensive understanding of shared risks.</p>	
<p>Improve Governance Readiness for Emerging Risks:</p> <p>Develop and implement cross-border initiatives to enhance governance readiness for emerging risks such as terrorism and cyber threats, which are identified as more likely in Germany but lack assessment in Austria.</p> <p>Strengthen coordination between national and regional authorities, law enforcement agencies, and emergency responders to mitigate the impacts of man-made disasters and cyber-attacks effectively.</p>	
<p>Invest in Early Warning Systems and Preparedness Measures:</p> <p>Enhance early warning systems and preparedness measures for hazards like flooding, extreme weather, wildfires, landslides, and avalanches, which pose significant risks to both Germany and Austria.</p> <p>Implement joint initiatives for monitoring and forecasting extreme weather events, sharing real-time data, and issuing timely warnings to at-risk communities on both sides of the border.</p>	
<p>Promote Cross-Border Cooperation in Risk Reduction:</p> <p>Facilitate the exchange of best practices and expertise in risk reduction and disaster management through joint training programs, workshops, and capacity-building initiatives.</p> <p>Establish bilateral agreements and cooperation frameworks to support joint response efforts, resource sharing, and mutual assistance during emergencies and disasters along the Germany-Austria border.</p>	

GERMANY - AUSTRIA



Address Gaps in Governance Readiness and Tools:

Identify and address gaps in governance readiness for hazards like drought, wildfires, and geophysical risks, where disparities exist between Germany and Austria.

Develop and implement cross-border initiatives to improve governance readiness, enhance coordination mechanisms, and strengthen institutional capacities to address shared risks effectively.

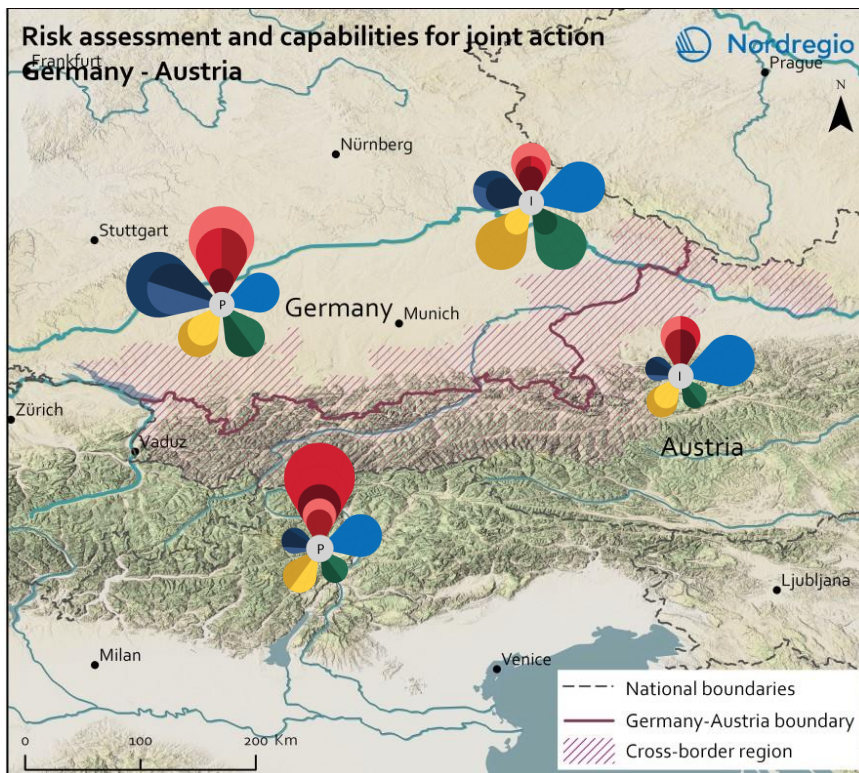
Enhance Data Availability and Quality:

Improve data sharing and information exchange mechanisms for hazards and risks with incomplete data, such as terrorism and cyber threats, to ensure a comprehensive understanding of cross-border vulnerabilities.

Invest in enhancing data availability and quality for man-made disasters and emerging threats, including nuclear accidents, critical infrastructure disruptions, terrorism, cyber-attacks, and epidemics/pandemics, through collaborative efforts between Germany and Austria.

Data availability/quality and resulting impact on reliability of the assessment

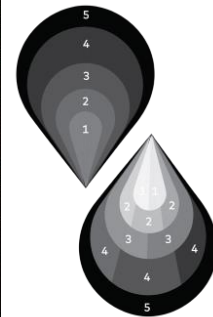
The assessment of data availability and quality for the Austrian side of the border leans towards medium to high, as indicated by the discovery of six agreements. Most risks can be evaluated using information from external sources. For Germany, there is a high availability and quality of data related to natural disasters. The analysis predominantly relies on national risk assessments conducted by responsible authorities, which also incorporate GIS visualization. Risk analyses concerning animal and plant diseases are of high quality and undergo regular updates. However, when it comes to man-made disasters such as nuclear accidents, critical infrastructure disruptions, terrorism, cyber-attacks, and epidemics/pandemics, the information primarily comes from national analyses that lack region-specific details.



LEGEND

Each side of the petal represents a different risk level, with the smallest petal indicating a low risk level (1).

When risk groups have identical values, they are depicted within the same petal, segmented by the color associated with each risk group.





Probability (P):
1 - low
5 - high

Impact (I):
1 - low
5 - high

		Probability		Impact		Capability
		Germany	Austria	Germany	Austria	Average
Meteorological and hydrological	extreme weather	5	2	2.5	3	1.5
	flooding	4	5	2.17	3	2
	drought	4	1	1.5	1.67	0.5
	wild fire	1	3	1	2	2
Geohazards	geophysical risk	3	3	3.67	3.67	1
Biological	epidemics/pandemics	3	1	3.67	1	1
	animal & plant diseases	3	1	1.33	1	0.5
Technological	nuclear & radiological accidents	2	2	1	1	0.5
	disruption of critical infrastructure	3	2	4	2.33	0.5
Societal	terrorism	4	1	3	1	0.5
	cyber threats	5	1	3	1	1
	migration	4	1	1.33	1	0.5

ORANGE: high probability (3 or higher) and low capability (1.5 or lower)
RED: high impact (3 or higher) and low capability (1.5 or lower)
DARK RED: low capability comes along with both high probability and high impact

Table 14 GERMANY - SWITZERLAND

GERMANY - SWITZERLAND	 
<p><u>Overall review of risks</u></p> <p>Flooding and geophysical risks are rated as more likely to occur than average across this border. According to the assessment on the German side, the likelihood of terrorism and cyber threats is also estimated as high – this is not a border-specific risk, but it is based on the NRA. On the Swiss side, these threats are also assessed at national level in the NRA, but the likelihood is estimated as low-medium.</p>	
<p><u>Discrepancies in risk assessment</u></p> <p>There are some discrepancies in the risk assessment across this border. While the main hazards are commonly identified, for Extreme Weather and Drought, Germany provides a score of 4, whereas Switzerland provides a score of 2. Discrepancies in the assessment of Disruption of Critical Infrastructure exist as Switzerland assessed it higher than Germany; Cyber threats and terrorism are scored high for Germany and average for Switzerland.</p>	
<p><u>Exposures and vulnerabilities</u></p> <p>The exposure is considered on both sides of the cross-border region to be medium to high for extreme weather and flooding events. Inconsistencies in the exposure assessment are seen in relation to forest fires (Germany: 1, Switzerland: 3 to 5).</p>	
<p><u>Potential impact</u></p> <p>The greatest impact identified would be in the event of a disruption to critical infrastructure, terrorism and cyber-attacks. The German side also has a high risk of epidemics/pandemics.</p>	
<p><u>Governance readiness and gaps</u></p> <p>With regards to bilateral agreements, it appears that the joints capabilities to respond to disasters are supported by five agreements with regards to the response phase (multi-risks) and to the management of the nuclear and radiological risks and industrial and chemical risks.</p>	
<p><u>Availability/gaps of cross-border tools/agreements</u></p> <p>There seems to be no tools or joint projects specific only for this cross-border region, there is a set of tools and institutions established which involve more cross-border regions, including this one. These tools/institutions deal mostly, but not only, with the prevention and preparedness phases, mainly for flooding and multi-risks. Capabilities are especially high in the area of nuclear safety.</p>	
<p><u>Recommendations</u></p> <p>Explore Financing for Joint Projects:</p> <p>Investigate opportunities for financing joint projects specific to the Germany-Switzerland cross-border territory, focusing on managing risks such as geophysical hazards, flooding, and extreme weather. This could involve seeking funding from national governments, international organizations, or cross-border cooperation initiatives.</p> <p>Strengthen Capabilities for Epidemic/Pandemic Management:</p> <p>Enhance capabilities for managing epidemics and pandemics along this cross-border region by investing in training, resources, and coordination mechanisms. Develop joint response plans and protocols to address public health emergencies collaboratively.</p> <p>Improve Data Availability and Quality:</p> <p>Enhance data sharing and information exchange between Germany and Switzerland to support more comprehensive risk assessments and decision-making processes. Ensure that data on hazards, vulnerabilities, and impacts are readily accessible, standardized, and up to date.</p> <p>Enhance Preparedness for Critical Infrastructure Disruptions:</p> <p>Develop strategies and measures to enhance preparedness for disruptions to critical infrastructure, including transportation networks, utilities, and communication systems. Conduct joint assessments of critical infrastructure vulnerabilities and develop contingency plans for mitigating potential disruptions.</p>	

GERMANY - SWITZERLAND



Address Discrepancies in Risk Assessments:

Collaborate to address discrepancies in risk assessments, particularly for hazards like extreme weather, drought, and forest fires. Align methodologies, criteria, and data sources to ensure consistency and comparability in risk assessments conducted on both sides of the border.

Explore Joint Tools and Projects:

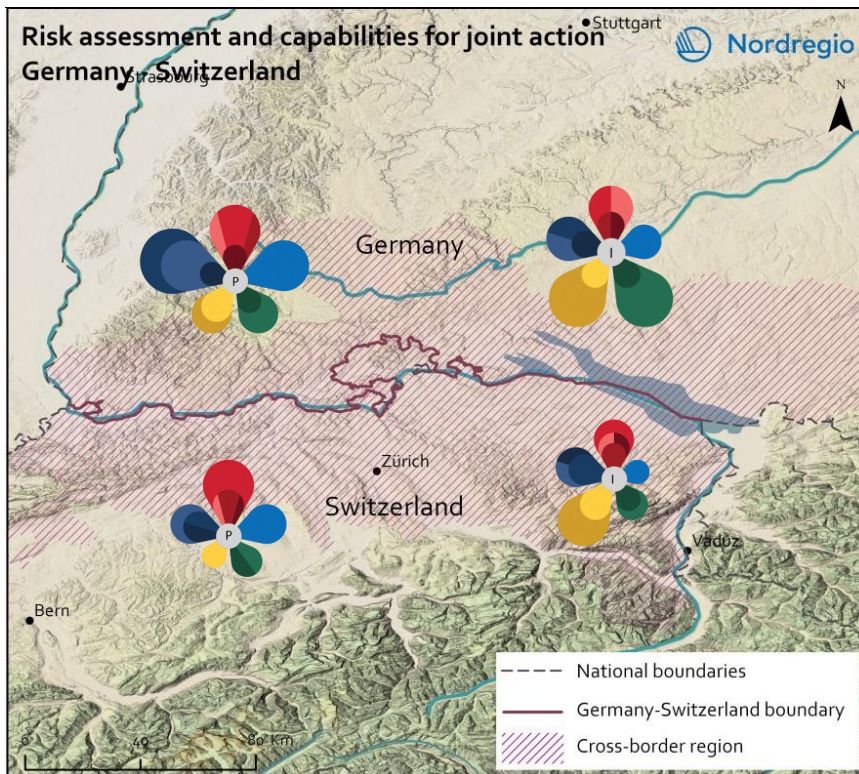
Explore the development of joint tools and projects specifically tailored to address the unique risks and challenges faced by the Germany-Switzerland cross-border region. This could involve leveraging existing frameworks, institutions, and initiatives to enhance cross-border cooperation on disaster risk management.

Enhance Nuclear Safety Measures:

Strengthen capabilities and resources for nuclear safety along the cross-border region, particularly in areas where there may be risks associated with nuclear and radiological accidents. Enhance coordination between relevant authorities and institutions to ensure effective response and communication in the event of nuclear incidents.

Data availability/quality and resulting impact on reliability of the assessment

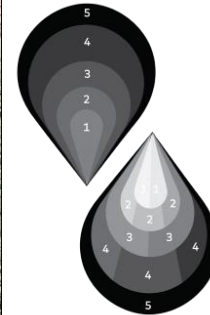
For Germany, the availability and quality of data on natural disasters is high. The analysis is mainly based on the national risk assessments of the responsible authorities, which are also partly based on GIS visualisation. Risk analyses on animal and plant diseases were of high quality and are regularly updated. For the Swiss border region, the risk assessment scores for some hazards are missing due to the lack of publicly available data. Also, all the scores included for the Swiss side are qualitative and subjective, as the NRA does not include a specific quantitative assessment on this border and the other documents consulted provide information not fully in line with the methodology used in this study. The authors evaluated the scores based on publicly available data and information. Regarding man-made disasters such as nuclear accidents, the disruption of critical infrastructure, terrorism and cyber-attacks, as well as epidemics/pandemics, it was only possible to draw on national analyses that were not region-specific. On the Swiss side, biological risks and nuclear and radiological accidents analyses are not publicly available.



LEGEND

Each side of the petal represents a different risk level, with the smallest petal indicating a low risk level (1).

When risk groups have identical values, they are depicted within the same petal, segmented by the color associated with each risk group.





Probability (P):
1 - low
5 - high

Impact (I):
1 - low
5 - high

		Probability		Impact		Capability
		Germany	Switzerland	Germany	Switzerland	Average
Meteorological and hydrological	extreme weather	4	2	2.5	1.67	1
	flooding	4	4	2.67	2.67	2.5
	drought	4	2	1.33	1.33	0.5
	wild fire	1	2	1	1.67	1
Geohazards	geophysical risk	4	3	1.83	1	1
Biological	epidemics/pandemics	3	2	3.67	1.5	0.5
	animal & plant diseases	1	2	1	1.33	1
Technological	nuclear & radiological accidents	2	1	1	2	2
	disruption of critical infrastructure	3	-	4	4	0.5
Societal	terrorism	4	3	3	3	0.5
	cyber threats	5	2	3	2	1
	migration	1	2	1	3	0.5

ORANGE: high probability (3 or higher) and low capability (1.5 or lower)
RED: high impact (3 or higher) and low capability (1.5 or lower)
DARK RED: low capability comes along with both high probability and high impact

Table 15 GERMANY – CZECH REPUBLIC

GERMANY – CZECH REPUBLIC	
	 
<u>Overall review of risks</u>	
The hazards that are more pressing across the border are: Flooding; Drought; and Disruption of Critical Infrastructure.	
<u>Discrepancies in risk assessment</u>	
Significant discrepancies emerge for both meteorological and hydrological hazards and societal hazards. As for meteorological and hydrological hazards: Extreme weather is scored as a 4 in Germany vs 1 in the Czech Republic; Drought is scored as a 5 in Germany and 3 in the Czech Republic; Wildfires is scored as 3 in Germany and 1 in the Czech Republic. As for societal hazards: Terrorism and Migration are scored as 4 in Germany and 1 in the Czech Republic, whereas Cyber threats are scored as 5 in Germany and 1 in the Czech Republic.	
<u>Exposures and vulnerabilities</u>	
There are large discrepancies in the exposure assessment for hydrological hazards. While the average rating from the German side for households, production capacities and infrastructure is around 4 out of 5, the Czech side rates these at around 2. The Czech side also rates the risk of exposure lower than the German side with regard to societal hazards (mean values: 1 vs. 2.33). The assessment from the Czech side shows that drought exposes the agriculture and forestry sectors. Flooding exposes housing and disruption of the critical infrastructures. Disruption of the critical infrastructure can expose the industry and housing, but probability of this risk is low.	
<u>Potential impact</u>	
Both sides see a major potential impact in the event of epidemics/pandemics. However, while in Germany the potential is also rated as high for the disruption of critical infrastructure (score: 4), terrorism and cyber attacks (3 in each case), the Czech side only sees this for flood events (score of 3). The drought impact on the agriculture sector can cause the disruption of plants production, in forestry sector can cause the problems with plants diseases. The disruption of the critical infrastructure can have a huge impact on industry.	
<u>Governance readiness and gaps</u>	
<ul style="list-style-type: none"> - There is a good governance preparedness for floods - Droughts and Disruption of critical infrastructure need a more attention - There is a room for the improvement in data sharing 	
The governance system appears as more developed in the Czech side of the border across hazards (with a full governance system recorded in Flooding, Drought, Nuclear and Radiological accidents, Disruption of Critical Infrastructure). In Germany, except for Geophysical risks (where agreements and initiatives were recorded), there are limited or no relevant initiatives, across hazards.	
<u>Availability/gaps of cross-border tools/agreements</u>	
Tools:	
<ul style="list-style-type: none"> - INTERREG projects, cooperation through the INTERREG, but almost all projects are focused on floods 	
Gaps:	
<ul style="list-style-type: none"> - There is a need for stronger support for other tool or INTERREG projects oriented to drought and disruption of critical infrastructure. 	
Agreements that address these were identified for all the disasters analysed. However, except for flood and drought events, there is a lack of joint projects.	
Availability of the tools connected with droughts, floods and severe weather is assess as very good (4) because of many INTERREG initiatives. Disruption of the critical infrastructure is mainly covered by the European agreements and agreements between CZ and DE.	

GERMANY – CZECH REPUBLIC



Recommendations

Address Discrepancies in Risk Assessment:

Collaborate to align methodologies and criteria for risk assessment to ensure consistency and comparability across borders. Exchange best practices and data sources to improve the accuracy of risk assessments for meteorological, hydrological, and societal hazards.

Strengthen Exposure and Vulnerability Assessment:

Enhance efforts to assess exposure and vulnerability to hazards, particularly for hydrological and societal hazards, on both sides of the border. Conduct joint assessments to identify common vulnerabilities and prioritize areas for intervention and risk reduction measures.

Improve Governance Readiness:

Focus on strengthening governance readiness for droughts and disruption of critical infrastructure on both sides of the border. Develop comprehensive response plans, coordination mechanisms, and capacity-building initiatives to enhance preparedness and response capabilities.

Promote Joint Projects and Initiatives:

Invest in joint projects and initiatives specifically focused on addressing droughts and disruption of critical infrastructure in the cross-border region. Leverage existing frameworks such as INTERREG to support the development and implementation of collaborative projects.

Improve Data Sharing and Information Exchange:

Enhance data sharing and information exchange mechanisms to improve the availability and quality of data related to natural and man-made hazards. Establish common platforms or protocols for sharing data and research findings across borders.

Strengthen Support for Risk Reduction Tools:

Provide stronger support for the development and implementation of risk reduction tools and initiatives targeting droughts and disruption of critical infrastructure. Allocate resources and funding to support research, innovation, and capacity-building efforts in these areas.

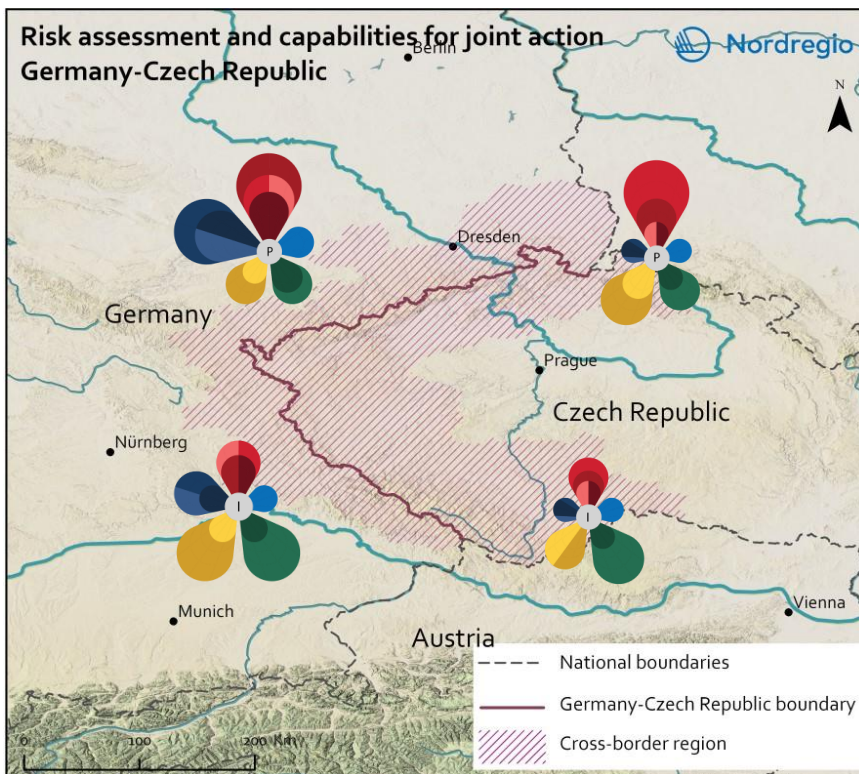
Address Data Availability Challenges:

Address challenges related to data availability for disruption of critical infrastructure, particularly in unstable geopolitical situations. Explore alternative data sources and collaboration opportunities to ensure reliable and up-to-date information for risk assessment and decision-making processes.

Data availability/quality and resulting impact on reliability of the assessment

For Germany, the availability and quality of data on natural disasters is high. The analysis is mainly based on the national risk assessments of the responsible authorities, which are also partly based on GIS visualisation. Risk analyses on animal and plant diseases were of high quality and are regularly updated. Regarding man-made disasters such as nuclear accidents, the disruption of critical infrastructure, terrorism and cyber-attacks, as well as epidemics/pandemics, it was only possible to draw on national analyses that were not region-specific.

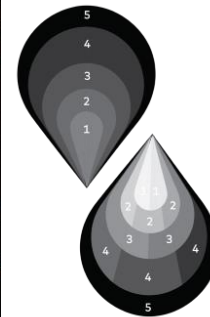
Data availability for drought, floods and severe weather is assessed as very good. The quality of the data is also assessed as very good (high level of research institutions). The data availability connected with the disruption of the critical infrastructure, like crude oil and gas, can be problematic because of the unstable situation with Russia.



LEGEND

Each side of the petal represents a different risk level, with the smallest petal indicating a low risk level (1).

When risk groups have identical values, they are depicted within the same petal, segmented by the color associated with each risk group.





Probability (P):
 1 - low
 5 - high

Impact (I):
 1 - low
 5 - high

ORANGE: high probability (3 or higher) and low capability (1.5 or lower)
RED: high impact (3 or higher) and low capability (1.5 or lower)
DARK RED: low capability comes along with both high probability and high impact

		Probability		Impact		Capability
		Germany	Czech Republic	Germany	Czech Republic	Average
Meteorological and hydrological	extreme weather	4	1	2.67	1	1
	flooding	4	5	2.5	3	2
	drought	5	3	2	1.67	1.5
	wild fires	3	1	1.83	1	1
Geohazards	geophysical risk	2	1	1	1	1.5
Biological	epidemics/pandemics	3	3	3.67	3.67	1.5
	animal & plant diseases	2	1	1.33	1	0.5
Technological	nuclear & radiological accidents	1	2	1	2.67	1.5
	disruption of critical infrastructure	3	4	4	2.5	1.5
Societal	terrorism	4	1	3	1	0.5
	cyber threats	5	1	3	1	1
	migration	4	1	1.33	1	0.5

Table 16 GERMANY - DENMARK

GERMANY - DENMARK	 
<u>Overall review of risks</u>	
The hazards with highest probability are: Extreme weather; Flooding; Animal and plant diseases; Terrorism and cyberthreats; and Disruption of critical infrastructure.	
<u>Discrepancies in risk assessment</u>	
There are only minor discrepancies in the risk assessment across all hazards.	
<u>Exposures and vulnerabilities</u>	
Extreme weather and risks associated with animal and plant diseases are assessed as high in both countries. Cyber threats against Denmark and Germany are assessed as very high, although not directly tied to the cross-border regions.	
<u>Potential impact</u>	
On the Danish side, the potential impact of extreme weather is assessed as average and for animal and plant diseases as high, affecting mainly economy and security of supply.	
<u>Governance readiness and gaps</u>	
There is a good governance preparedness for some risks, and gaps for some (however, this is mostly in the case when the risk is deemed unlikely). Some agreements and initiatives have been uncovered across the exercise. For example, there are agreements/initiatives regarding Extreme Weather and Flooding, Wildfires and Disruption of critical infrastructure.	
<u>Availability/gaps of cross-border tools/agreements</u>	
With the "Emergency Response without Borders version 2.0" programme, institutional capacity in emergency response in the border region was expanded, thereby strengthening resilience to extreme weather, flooding, wildfires and the disruption of critical infrastructure. However, there is a lack of agreements, tools and processes in the event of epidemics.	
<u>Recommendations</u>	
Strengthen Capability for Managing Epidemics/Pandemics:	
Develop joint action plans and protocols between local healthcare facilities in Germany and Denmark to effectively respond to epidemics and pandemics. Establish mechanisms for sharing resources, information, and expertise to enhance coordination and response capabilities.	
Enhance Cross-Border Cooperation in Emergency Response:	
Expand and strengthen the "Emergency Response without Borders" programme to include agreements, tools, and processes specifically tailored for epidemics and pandemics. Foster collaboration between emergency response agencies and healthcare authorities on both sides of the border to ensure a coordinated and effective response to health emergencies.	
Build Joint Material Reserve:	
Establish a joint material reserve comprising essential medical supplies, equipment, and pharmaceuticals to support emergency response efforts during epidemics and pandemics. Ensure that the reserve is strategically located and easily accessible to healthcare facilities in the border region.	
Improve Data Sharing and Information Exchange:	
Enhance data sharing and information exchange mechanisms between Germany and Denmark to improve the availability and quality of data related to epidemics and pandemics. Develop common platforms or protocols for sharing epidemiological data, surveillance reports, and outbreak information in real-time.	
Conduct Joint Training and Exercises:	
Organize joint training sessions and exercises involving healthcare professionals, emergency responders, and public health authorities from both countries. Simulate scenarios related to epidemic and pandemic response to test coordination, communication, and decision-making processes.	

GERMANY - DENMARK



Establish Early Warning Systems:

Implement early warning systems for detecting and monitoring infectious disease outbreaks in the border region. Enhance surveillance capabilities and data collection mechanisms to facilitate early detection and rapid response to emerging health threats.

Promote Public Awareness and Education:

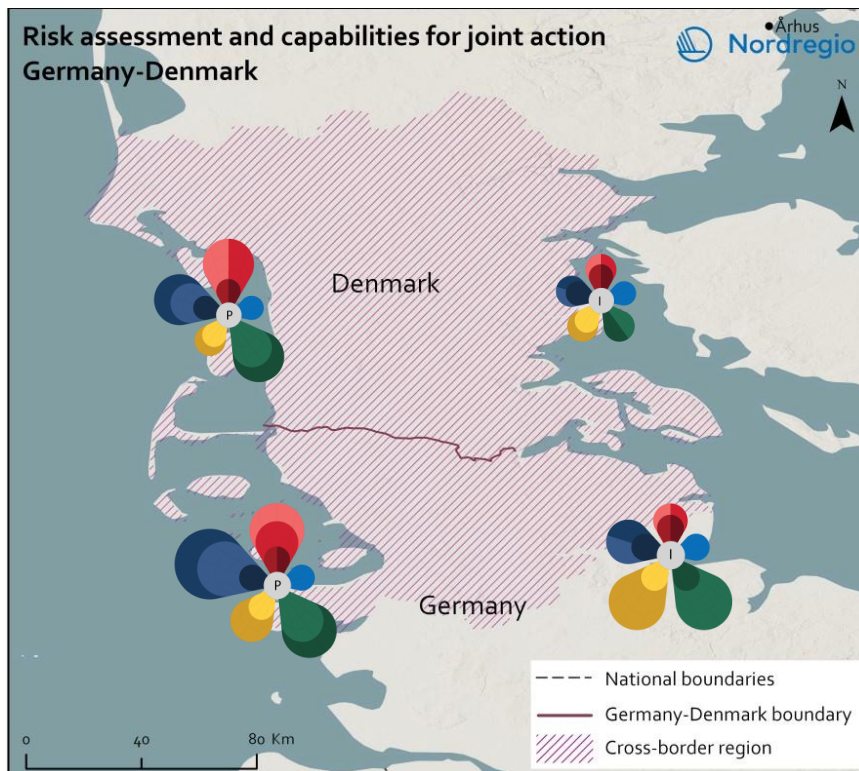
Launch public awareness campaigns to educate residents and stakeholders in the border region about epidemic and pandemic preparedness. Provide information on preventive measures, vaccination programmes, and healthcare resources available on both sides of the border.

Foster Collaboration with International Health Organizations:

Strengthen collaboration with international health organizations, such as the World Health Organization (WHO) and the European Centre for Disease Prevention and Control (ECDC), to access expertise, resources, and best practices in epidemic and pandemic management.

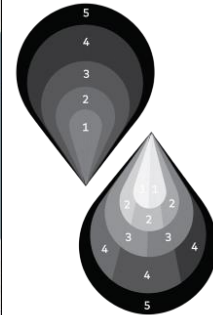
Data availability/quality and resulting impact on reliability of the assessment

For Denmark, the data quality and availability are good. The analysis draws from national and regional risk assessments, supplemented with expert interviews. For Germany, the availability and quality of data on natural disasters is high. The analysis is mainly based on the national risk assessments of the responsible authorities, which are also partly based on GIS visualization. Risk analyses on animal and plant diseases were of high quality and are regularly updated. Regarding man-made disasters such as nuclear accidents, the disruption of critical infrastructure, terrorism and cyber-attacks, as well as epidemics/pandemics, it was only possible to draw on national analyses that were not region-specific.



LEGEND
 Each side of the petal represents a different risk level, with the smallest petal indicating a low risk level (1).

When risk groups have identical values, they are depicted within the same petal, segmented by the color associated with each risk group.





Probability (P):
 1 - low
 5 - high

Impact (I):
 1 - low
 5 - high

		Probability		Impact		Capability
		Germany	Denmark	Germany	Denmark	Average
Meteorological and hydrological	extreme weather	4	4	1.67	2	1.5
	flooding	3	4	2.17	2	1.5
	draught	1	1	1	1.17	0
	wild fire	1	1	1	1.17	1
Geohazards	geophysical risk	1	1	1	1	0
Biological	epidemics/pandemics	3	3	3.67	1.67	0
	animal & plant diseases	4	4	1.33	1.5	0
Technological	nuclear & radiological emergencies	1	1	1	1	0
	disruption of critical infrastructure	3	2	4	1.67	1
Societal	terrorism	4	3	3	1.83	0
	cyber threats	5	4	3	2.33	0.5
	migration	1	1	1	1	0

ORANGE: high probability (3 or higher) and low capability (1.5 or lower)
RED: high impact (3 or higher) and low capability (1.5 or lower)
DARK RED: low capability comes along with both high probability and high impact

Table 17 GERMANY - POLAND

GERMANY - POLAND	 
<p><u>Overall review of risks</u></p> <p>The hazards that appear most likely to occur are extreme weather; flooding; epidemic/pandemics; animal and plant disease; terrorism; cyber-threats; and migration.</p>	
<p><u>Discrepancies in risk assessment</u></p> <p>The risk assessment is overall similar across the two sides of the border; the only exception being Epidemics and Pandemics, scored as 5 in Germany and 3 in Poland.</p>	
<p><u>Exposures and vulnerabilities</u></p> <p>The cross-border territory between Germany and Poland is significantly affected by strong winds in its northern area and by floods in the southern area. This border is particularly vulnerable to flood risks. In addition, between July 2022 and September 2022, a significant fish die-off was extensively documented in the area.</p>	
<p><u>Potential impact</u></p> <p>The border regions are not heavily populated. It seems that despite the high probability of flooding and extreme weather, the risk can be assessed as average, many retention infrastructures have been developed and the recent initiatives of the Government of Poland and the Federal Republic of Germany to work together on the Oder River in 2015 should prevent the risk of flooding in the area. Finally, the recent fish die-off has had a strong impact on the entire ecosystem of the Oder River, with potential consequences for the years to come on the environment of the border region.</p>	
<p><u>Governance readiness and gaps</u></p> <p>Cooperation in the border region is quite robust, supported by a substantial body of international, national, and regional agreements. This foundation fosters strong ties of collaboration, including at the regional and land level.</p>	
<p><u>Availability/gaps of cross-border tools/agreements</u></p> <p>Cross-border cooperation is effectively defined through existing agreements, particularly in the areas of flood protection and water management, which serve as the structural foundation for most cross-border collaborative efforts.</p> <p>However, regulatory gaps hinder cross-border cooperation due to a lack of understanding of the functioning of cross-border cooperation at regional and local levels. Governmental unawareness often results in reliance on centralised decisions during crises. Despite an established regulatory framework, crises reveal confusion about coordinating effective responses, given the lack of understanding of competencies across authorities and their responsibilities, as well as the absence of general information points (e.g. Covid-19). Sometimes, the effectiveness of cooperation may depend on the political party overseeing the region.</p>	
<p><u>Recommendations</u></p> <p>Strengthen Capability for Managing Epidemics/Pandemics, Terrorism, and Cyber Threats:</p> <p>Develop joint action plans and protocols between Germany and Poland to effectively respond to epidemics, terrorism, and cyber threats. Establish mechanisms for sharing information, intelligence, and resources to enhance coordination and response capabilities in the border region.</p> <p>Enhance Cooperation in Wildfire and Drought Management:</p> <p>Foster collaboration between Germany and Poland in wildfire and drought management through joint projects, initiatives, and capacity-building programmes. Exchange best practices, technologies, and expertise to improve preparedness, prevention, and response to these hazards.</p> <p>Establish Cross-Border Information Point:</p> <p>Establish a cross-border information point to coordinate actions and communication during times of crisis, such as epidemics or natural disasters. This information point could serve as a central hub for sharing real-time data, updates, and emergency protocols between relevant authorities and stakeholders on both sides of the border.</p>	

GERMANY - POLAND



Improve Regulatory Framework for Border Regions:

Enhance the regulatory framework at the national level to better recognize and accommodate the specificities of border regions. This includes facilitating cross-border cooperation, clarifying competencies and responsibilities across authorities, and promoting decentralized decision-making processes during crises.

Deepen Cross-Border Cooperation Beyond Flood Events:

Explore opportunities to deepen cross-border cooperation beyond flood events by initiating joint projects, initiatives, and partnerships focused on other hazards, such as extreme weather, epidemics, terrorism, and cyber threats. Invest in building trust, collaboration, and mutual understanding between authorities and stakeholders from both countries.

Facilitate Discussions and Collaboration Along the Berlin-Warsaw Axis:

Promote discussions and collaboration along the Berlin-Warsaw axis to strengthen bilateral ties and foster regional cooperation between Germany and Poland. Encourage dialogue, information sharing, and joint initiatives between governmental and non-governmental actors to address common challenges and enhance resilience in the border region.

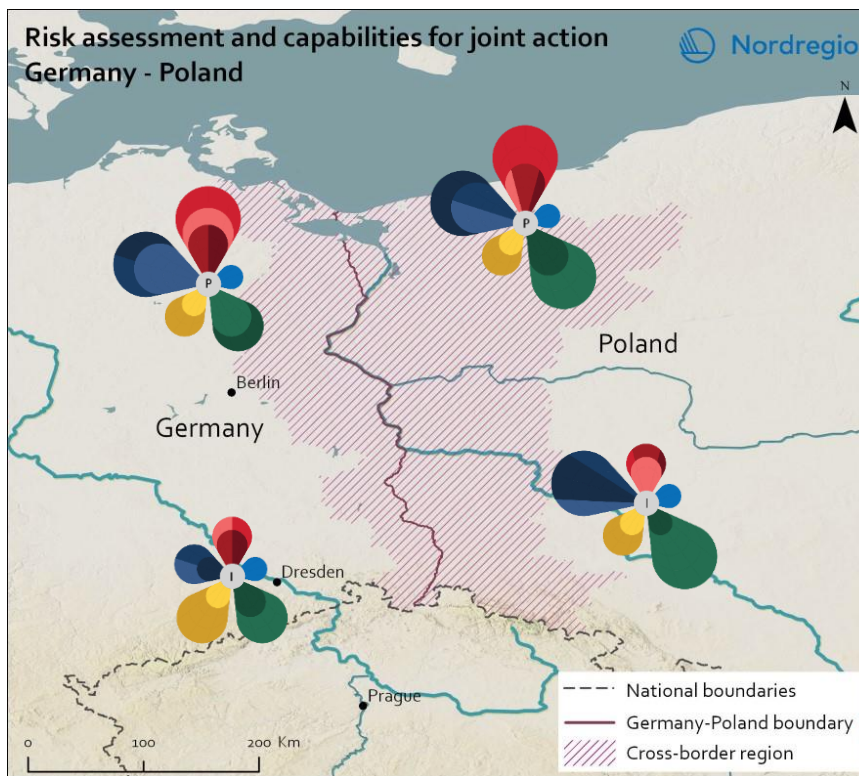
Utilize Comprehensive IT Systems for Risk Assessment:

Utilize comprehensive IT systems, such as Poland's IT Country Protection System for flood risk assessment, to improve data availability, visualization, and analysis for natural disasters. Invest in enhancing GIS capabilities and digital infrastructure to support evidence-based decision-making and risk management efforts.

Data availability/quality and resulting impact on reliability of the assessment

The data quality and availability are relatively strong and well-documented, particularly due to the high risk of flooding in the region. The analysis is based on national and regional risk assessments. Poland has developed a comprehensive IT Country Protection System for preliminary flood risk assessment, including GIS visualization, which provides a robust dataset.

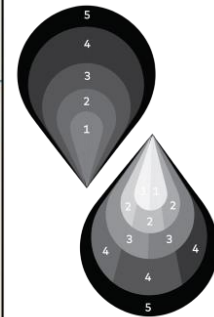
For Germany, the availability and quality of data on natural disasters is high. The analysis is mainly based on the national risk assessments of the responsible authorities, which are also partly based on GIS visualisation. Risk analyses on animal and plant diseases were of high quality and are regularly updated. Regarding man-made disasters such as nuclear accidents, the disruption of critical infrastructure, terrorism and cyber-attacks, as well as epidemics/pandemics, it was only possible to draw on national analyses that were not region-specific.



LEGEND

Each side of the petal represents a different risk level, with the smallest petal indicating a low risk level (1).

When risk groups have identical values, they are depicted within the same petal, segmented by the color associated with each risk group.





Probability (P):
 1 - low
 5 - high

Impact (I):
 1 - low
 5 - high

	Probability		Impact		Capability	
	Germany	Poland	Germany	Poland	Average	
Meteorological and hydrological	extreme weather	4	3	2.83	2	1
	flooding	5	5	3.17	3	2.5
	drought	3	3	1.83	3.17	0.5
	wild fires	3	3	1.83	3	1
Geohazards	geophysical risk	1	1	1	1	0.5
Biological	epidemics / pandemics	3	5	3.67	5	0.5
	animal & plant diseases	4	3	1.83	1.33	0.5
Technological	nuclear & radiological emergencies	1	1	1	1	0.5
	disruption of critical infrastructure	3	3	4	3.17	0.5
Societal	terrorism	4	4	3	5	0.5
	cyber threats	5	4	3	5	1
	migration	5	5	1.33	5	0.5

ORANGE: high probability (3 or higher) and low capability (1.5 or lower)
RED: high impact (3 or higher) and low capability (1.5 or lower)
DARK RED: low capability comes along with both high probability and high impact

Table 18 DENMARK - SWEDEN

DENMARK - SWEDEN  
<p><u>Overall review of risks</u></p> <p>The hazards that, according to the expert assessment, are more likely to occur are: Extreme weather; Flooding; Epidemics/pandemics; Disruption of critical infrastructure; and Cyber-threats.</p>
<p><u>Discrepancies in risk assessment</u></p> <p>The assessment is similar across borders, with limited or no difference. The only exceptions are wildfires (1 Denmark, 3 Sweden) and terrorism (4 Denmark, 2 Sweden).</p>
<p><u>Exposures and vulnerabilities</u></p> <p>Disruption of critical infrastructure has received the highest assessment due to the Öresund bridge connecting the countries; followed by flooding and epidemics and pandemics. Vulnerability to nuclear and radiological accidents is assessed as high on the Swedish side due to close proximity to Barsebäck nuclear power plant in Skåne region.</p>
<p><u>Potential impact</u></p> <p>Highest impact is associated with extreme weather events, disruption of critical infrastructure, as well as terrorist and cyber threats.</p>
<p><u>Governance readiness and gaps</u></p> <p>Governance capabilities for joint action have been established to address a wide range of natural and human-induced risks. This is demonstrated through agreements between fire brigades and initiatives like joint exercises and knowledge sharing under the auspices of the Nordred.</p>
<p><u>Availability/gaps of cross-border tools/agreements</u></p> <p>Cooperation among rescue services is operational within the framework of Nordred. Additionally, there is a solidarity agreement between Denmark and Sweden, which aims to secure the gas supply in case of emergencies.</p>
<p><u>Recommendations</u></p> <p>Strengthen Cross-Border Governance for Epidemics/Pandemics:</p> <p>Enhance cross-border governance readiness for epidemics and pandemics by establishing joint protocols, communication channels, and response mechanisms between Denmark and Sweden. Develop coordinated action plans to address public health emergencies and ensure effective collaboration in managing disease outbreaks, as demonstrated by the recent COVID-19 pandemic.</p> <p>Enhance Cross-Border Cooperation in Risk Management:</p> <p>Foster closer cooperation between Denmark and Sweden in risk management, particularly for hazards such as extreme weather, flooding, disruption of critical infrastructure, and cyber threats. Expand existing agreements and initiatives to include comprehensive risk assessment, joint exercises, and knowledge sharing to enhance resilience and response capabilities across the border region.</p> <p>Utilize Existing Cross-Border Tools and Agreements:</p> <p>Leverage existing cross-border tools and agreements, such as Nordred and the solidarity agreement between Denmark and Sweden, to facilitate collaboration and coordination in emergency response and disaster management. Ensure that these frameworks are effectively utilized and regularly reviewed to address evolving risks and challenges.</p> <p>Improve Data Availability and Quality:</p> <p>Enhance data availability and quality for risk assessment and disaster management in the border region. Invest in comprehensive regional risk assessments, including hazard mapping, vulnerability assessments, and scenario planning, to provide a more accurate understanding of cross-border risks and vulnerabilities.</p> <p>Promote Information Sharing and Exchange:</p> <p>Promote information sharing and exchange between Denmark and Sweden on risk assessment, early warning systems, and best practices in disaster management. Establish mechanisms for sharing real-time data, updates, and lessons learned to facilitate mutual learning and continuous improvement in cross-border resilience and response.</p>

DENMARK - SWEDEN



Address Vulnerabilities to Critical Infrastructure:

Address vulnerabilities to critical infrastructure, such as the Öresund bridge connecting Denmark and Sweden, by implementing risk mitigation measures and contingency plans. Collaborate on infrastructure resilience initiatives, including maintenance, monitoring, and emergency preparedness, to ensure the uninterrupted flow of essential services and connectivity across the border.


Enhance Public Awareness and Community Resilience:

Enhance public awareness and community resilience in the cross-border region through education, training, and outreach initiatives. Empower local communities with the knowledge and resources to prepare for and respond to emergencies, including access to emergency services, evacuation procedures, and communication channels.

Data availability/quality and resulting impact on reliability of the assessment

For Denmark, the data quality and availability are good. The analysis draws from national and regional risk assessments, supplemented with expert interviews. Data availability and quality for Sweden are significantly lower. No regional risk assessments are publicly available, while the national risk assessment is rather broad.

Table 19 ESTONIA - LATVIA

ESTONIA - LATVIA	
<p><u>Overall review of risks</u></p> <p>Only wildfires, epidemics/pandemics and animal and plant diseases are considered high risk. The risks with the lowest probability are geophysical risk, nuclear and radiological accidents, and cyber threats.</p>	
<p><u>Discrepancies in risk assessment</u></p> <p>The evaluation of most risks is similar across borders except for: Extreme weather (1 Estonia, 4 Latvia); Flooding (1 Estonia, 4 Latvia); Drought (1 Estonia, 3 Latvia); Wildfires (2 Estonia, 5 Latvia); Epidemics/pandemics (2 Estonia, 4 Latvia).</p>	
<p><u>Exposures and vulnerabilities</u></p> <p>The border is mostly covered by forests, meadows, wetlands and fields. The population density is low, thus the area vulnerable for wildfires and animal and plant diseases.</p>	
<p><u>Potential impact</u></p> <p>The potential impact of fires is the highest for agriculture and wildlife in forests.</p>	
<p><u>Governance readiness and gaps</u></p> <p>Governance readiness is generally medium to low on both sides, except for Latvia when it comes to meteorological/hydrological risks and animal/plant diseases.</p> <p>Governance readiness is generally on medium level to low on both sides – there are cooperation agreements in place covering the most hazards. However, the capacity to jointly react on geophysical risks and disruption of physical infrastructure are not enough addressed, except for Latvia when it comes to meteorological/hydrological risks and animal/plant diseases.</p>	
<p><u>Availability/gaps of cross-border tools/agreements</u></p> <p>Cross-border cooperation is covered for environmental risks as well as animal and plant diseases. Cyber threats are covered with cooperation agreements. However, there was no data found on capability to jointly react on nuclear and radiological accidents as well as geophysical risks.</p>	
<p><u>Recommendations</u></p> <p>Strengthen Capacity for Managing Animal and Plant Diseases:</p> <p>Develop joint action plans and response mechanisms to effectively manage the risk of animal and plant diseases in the border region. Enhance collaboration between Estonia and Latvia in surveillance, early detection, and control measures to prevent the spread of diseases and minimize their impact on agriculture and wildlife.</p> <p>Address Technological and Societal Hazards:</p> <p>Improve preparedness and response capabilities for technological and societal hazards, including wildfires, epidemics/pandemics, and cyber threats. Enhance coordination between Estonian and Latvian authorities, emergency services, and relevant stakeholders to mitigate the effects of these hazards and protect public health, infrastructure, and critical systems.</p> <p>Enhance Preparedness for Nuclear and Radiological Accidents:</p> <p>Strengthen capacity to respond to nuclear and radiological accidents, despite their low probability of occurrence. Develop joint protocols and contingency plans for rapid response, evacuation, and communication in the event of a nuclear incident, considering the potential cross-border impact and the proximity of nuclear facilities in neighbouring countries.</p> <p>Address Geophysical Risks:</p> <p>Improve readiness to manage geophysical risks, such as earthquakes and landslides, by enhancing cooperation and sharing resources between Estonia and Latvia. Develop risk assessment tools, early warning systems, and response plans tailored to the specific hazards faced by the border region, considering the geological characteristics and vulnerabilities of the area.</p>	

ESTONIA - LATVIA



Promote Cross-Border Cooperation and Agreements:

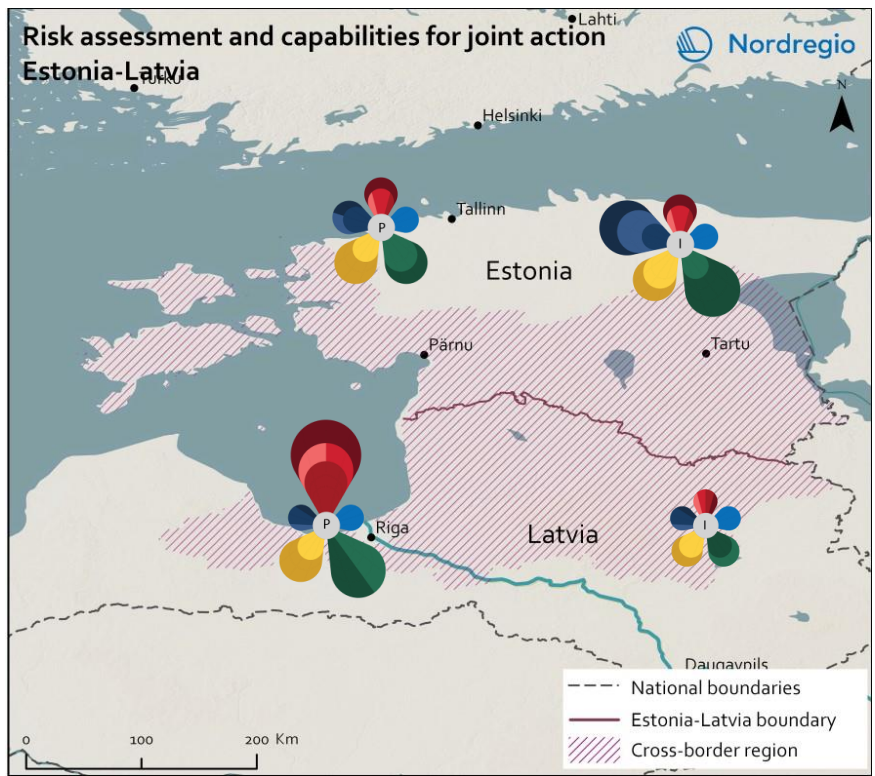
Strengthen cross-border cooperation and agreements to address a wide range of hazards, including environmental risks and animal and plant diseases. Enhance communication channels, information sharing, and joint exercises to build trust, interoperability, and resilience in the face of emergencies.

Improve Data Availability and Quality:

Invest in improving data availability and quality for risk assessment, particularly for societal risks, nuclear and radiological accidents, and geophysical hazards. Enhance data sharing mechanisms, surveillance systems, and monitoring networks to provide timely and accurate information for decision-making and response coordination.

Data availability/quality and resulting impact on reliability of the assessment

Data was sufficiently available for environmental risks, but not sufficient for societal risks (epidemics/pandemics, terrorism, migration), nuclear and radiological accidents as well as geophysical risks.



LEGEND

Each side of the petal represents a different risk level, with the smallest petal indicating a low risk level (1).

When risk groups have identical values, they are depicted within the same petal, segmented by the color associated with each risk group.

Probability (P):
1 - low
5 - high

Impact (I):
1 - low
5 - high



		Probability		Impact		Capability
		Estonia	Latvia	Estonia	Latvia	Average
Meteorological and hydrological	extreme weather	1	4	1.33	1.17	2
	flooding	1	4	1.33	1	2
	drought	1	3	1.17	1.17	2
	wild fires	2	5	1.67	1.33	2
Geohazards	geophysical risk	1	1	1	1	1
Biological	epidemics / pandemics	2	4	1.33	2.33	1.5
	animal & plant diseases	3	4	3.5	1.17	2
Technological	nuclear & radiological emergencies	1	1	2.17	1.17	1.5
	disruption of critical infrastructure	3	3	3.33	1.83	1.5
Societal	terrorism	2	1	2.67	1	2
	cyber threats	1	1	1	1	2
	migration	2	1	3.5	1	2

ORANGE: high probability (3 or higher) and low capability (1.5 or lower)

RED: high impact (3 or higher) and low capability (1.5 or lower)

DARK RED: low capability comes along with both high probability and high impact

Table 20 GREECE - NORTH MACEDONIA

GREECE - NORTH MACEDONIA ¹	 
<u>Overall review of risks</u>	
Geophysical, technological and societal hazards are not considered as high risks in this border. All meteorological and hydrological hazards are above average in terms of risk, with exception of drought. Hazards with the highest probability are wildfires, flooding, epidemic/pandemics and extreme weather.	
<u>Discrepancies in risk assessment</u>	
The risk assessment is largely similar across the border, with either limited or no variation. The only significant exceptions are epidemics/pandemics (scored as 5 in Greece and 3 in North Macedonia), Cyber threats (scored as 3 in Greece and 1 in North Macedonia) and Migration (scored as 1 in Greece and 4 in North Macedonia).	
<u>Exposures and vulnerabilities</u>	
On the Greek side of the border, infrastructure and housing are highly exposed to flooding and wildfires. Production capacities are also exposed to wildfires. This is less the case on the North Macedonian side of the border. On the Greek side of the border housing is highly exposed to earthquakes and landslides and slightly less so on the North Macedonian side of the border.	
<u>Potential impact</u>	
The potential impact is highest for flooding, earthquakes, and wildfires, particularly on the Greek side of the border compared to the North Macedonian side. Epidemics/pandemics, as well as animal and plant diseases, also have a significant impact.	
<u>Governance readiness and gaps</u>	
There are extreme capability gaps identified across all hazards in both countries, except for wildfires and flooding events, where significant governance efforts are observed in both areas.	
<u>Availability/gaps of cross-border tools/agreements</u>	
There is an Action plan on the intensification and enrichment of cooperation between the Hellenic Republic and the Republic of North Macedonia (as provided for in the Prespa Agreement with particular focus on preventing and dealing with natural and manmade disasters. Several projects under INTERREG 2014-2020 have been implemented to improve the efficient detection and management of forest fires, conduct risk assessments, and provide solutions for prevention. Several INTERREG projects were implemented to address policies for addressing flooding.	
Despite some positive steps with regards to the risks of forest fires and floods the governance framework for high-probability hazards like extreme weather and epidemics/pandemics is underdeveloped. Additionally, while migration is assessed as a high risk on the North Macedonian side of the border, coordination efforts are scarce.	
<u>Recommendations</u>	
Strengthen Governance Framework for High-Probability Hazards:	
Develop comprehensive governance frameworks and action plans specifically targeting high-probability hazards such as extreme weather events, epidemics/pandemics, and wildfires. These frameworks should outline clear roles, responsibilities, and coordination mechanisms between relevant authorities and agencies in both Greece and North Macedonia.	
Enhance Collaboration on Biological Risks:	
Strengthen collaboration and information-sharing mechanisms between Greece and North Macedonia to effectively manage biological risks, including epidemics/pandemics and animal and plant diseases. Implement integrated surveillance systems, early warning systems, and joint risk assessments to detect and monitor outbreaks and mitigate their impact on public health and agriculture.	
Improve Preparedness for Extreme Weather Events:	
Enhance preparedness measures and response capabilities for extreme weather events, including floods and landslides, on both sides of the border. Develop joint risk assessments, early warning systems, and	

¹ The patterns in migration and governance readiness warrant further investigation.

GREECE - NORTH MACEDONIA¹



emergency response plans to mitigate the impact of these hazards on infrastructure, housing, and local communities.

Enhance Coordination on Migration Issues:

Strengthen coordination and cooperation between Greece and North Macedonia to address migration-related challenges, particularly along Balkan migration routes passing through the cross-border region. Develop joint strategies, protocols, and initiatives to ensure the safety, security, and well-being of migrants and local communities.

Utilise INTERREG Programmes for Collaborative Projects:

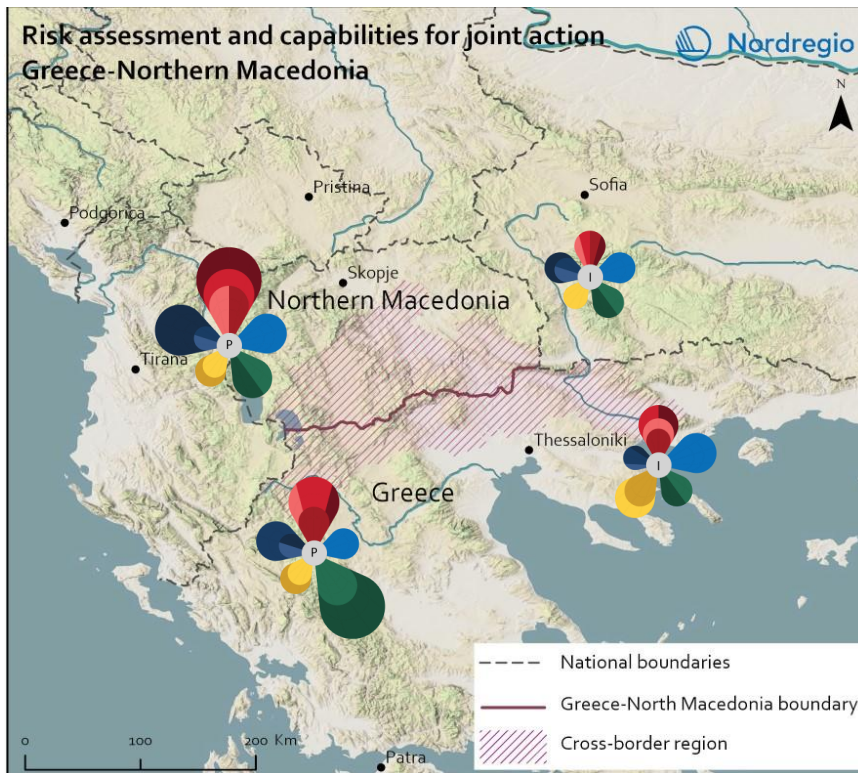
Leverage existing INTERREG programmes and initiatives to support collaborative projects and activities aimed at enhancing disaster preparedness and risk management in the cross-border region. Explore opportunities for funding and implementing projects focused on forest fire management, flood prevention, and other relevant areas.

Enhance Data Availability and Quality:

Improve data availability and quality for risk assessment by enhancing national risk assessment processes and incorporating border-specific risks into the assessment framework. Invest in data collection, monitoring, and analysis tools to provide reliable and up-to-date information for decision-making and planning purposes.

Data availability/quality and resulting impact on reliability of the assessment

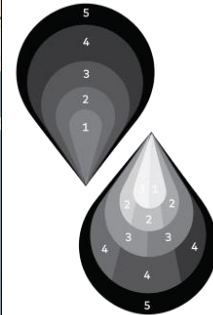
Data availability is assessed as medium for the Greek side of the border given that most of the risks have been assessed based on external sources and they are not included in the National Risk Assessment.



LEGEND

Each side of the petal represents a different risk level, with the smallest petal indicating a low risk level (1).

When risk groups have identical values, they are depicted within the same petal, segmented by the color associated with each risk group.





Probability (P):
1 - low
5 - high

Impact (I):
1 - low
5 - high

		Probability		Impact		Capability
		Greece	North Macedonia	Greece	North Macedonia	Average
Meteorological and hydrological	extreme weather	4	3	1.83	1.83	0
	flooding	4	4	3.17	1.67	2.5
	drought	2	3	1.33	2.17	0
	wild fire	4	5	2.67	2	2.5
Geohazards	geophysical risk	2	3	2.67	2	0
Biological	epidemics / pandemics	5	3	2	2	1
	animal & plant diseases	3	3	1.83	1.67	0
Technological	nuclear & radiological accidents	1	1	2.5	1.33	0
	disruption of essential infrastructure	2	2	2.33	-	0
Societal	terrorism	1	1	1	1	1
	cyber threats	3	1	1.33	1	0
	migration	1	4	1	1.5	0.5

ORANGE: high probability (3 or higher) and low capability (1.5 or lower)
RED: high impact (3 or higher) and low capability (1.5 or lower)
DARK RED: low capability comes along with both high probability and high impact

Table 21 SPAIN – FRANCE

SPAIN – FRANCE	
	 
<u>Overall review of risks</u>	
Drought, wildfires and geophysical hazards are considered of high risk across the two sides of the border. Data for biological risks is not available on the Spanish side.	
<u>Discrepancies in risk assessment</u>	
There are discrepancies in the assessment of the probability of societal hazards at the border: for France it has been assessed as high, whereas for Spain as low. This warrants further investigation. The situation is similar for the Disruption of critical infrastructure. There is no discrepancy in the assessments for Meteorological and Hydrological risks.	
<u>Exposures and vulnerabilities</u>	
The most significant exposure and vulnerability effects on both sides of the border are observed concerning meteorological and hydrological risks, as well as geohazards and technological risks. Disparities exist in terms of societal risks, and there is a lack of exposure data in terms of biological risks on the Spanish border.	
<u>Potential impact</u>	
The potential impacts on both sides of the border are primarily observed in relation to the economy, security of supply, infrastructure, functional capacity of the population, and services. Less impact is observed on international and EU activities, defence capability, and internal security. The assessment on both sides of the border is largely aligned, with the French side of the border reporting slightly higher exposure to societal risks.	
<u>Governance readiness and gaps</u>	
The governance system for all meteorological and hydrological hazards and for Geophysical risks is overall well developed on the French side of the border. On the Spanish side of the border, there is an advanced governance structure for Extreme Weather and a good structure for Wildfires. All the other hazards present significant governance gaps. Data for Spain on Societal risks is missing.	
<u>Availability/gaps of cross-border tools/agreements</u>	
Cross-border cooperation between Spain and France is well defined in terms of existing agreements (6 identified) and working models with the Working Community of the Pyrenees (CTP) providing structural basis for the majority of cross-border cooperation in the region.	
<u>Recommendations</u>	
Address Discrepancies in Risk Assessment:	
Investigate and reconcile discrepancies in the assessment of societal hazards and disruption of critical infrastructure between Spain and France. This could involve conducting joint risk assessments, sharing data and expertise, and fostering dialogue between relevant authorities on both sides of the border.	
Strengthen Management of High-Risk Hazards:	
Focus efforts on strengthening the management of high-risk hazards such as drought, wildfires, and geophysical hazards. Develop comprehensive risk mitigation strategies, early warning systems, and emergency response plans tailored to the specific challenges and vulnerabilities of the cross-border region.	
Enhance Governance Structures for All Hazards:	
Improve governance structures and capabilities for managing a wide range of hazards, including meteorological, hydrological, geophysical, technological, and societal risks. Allocate resources and establish coordination mechanisms to ensure effective preparedness, response, and recovery efforts across the border.	
Improve Data Availability and Quality:	
Address data gaps and limitations, particularly regarding biological risks and societal hazards on the Spanish side of the border. Enhance collaboration between national risk assessment agencies, civil protection authorities, and other relevant stakeholders to collect, analyse, and share data on emerging threats and vulnerabilities.	
Strengthen Cross-Border Cooperation:	
Build upon existing agreements and working models, such as the Working Community of the Pyrenees (CTP), to enhance cross-border cooperation and coordination. Foster collaboration between regional authorities,	

SPAIN – FRANCE



emergency services, and other stakeholders to exchange best practices, share resources, and implement joint projects aimed at improving disaster resilience.

Invest in Cyber Risk Preparedness:

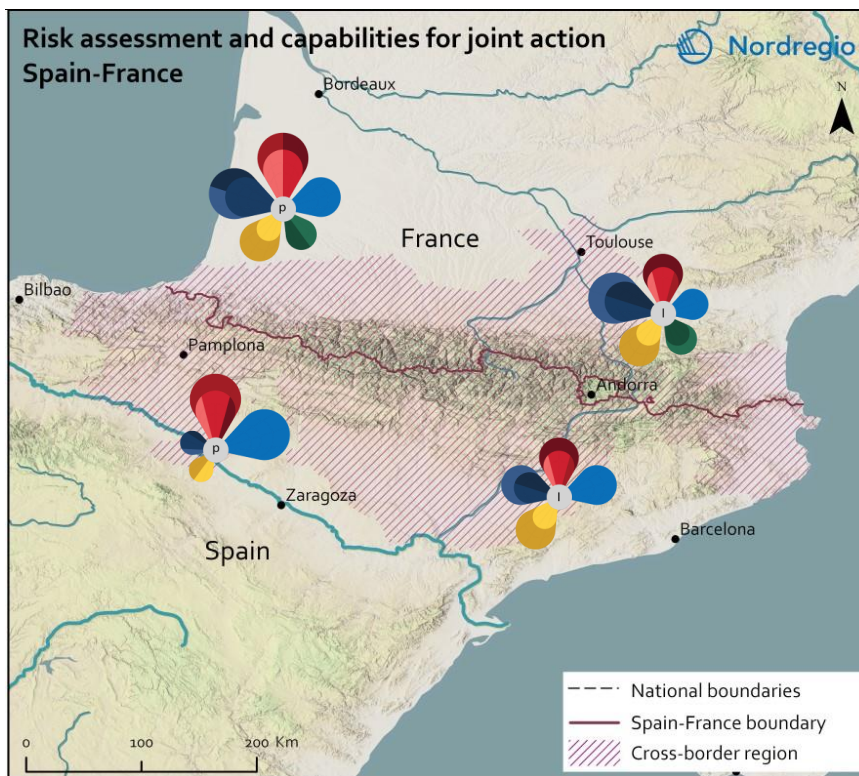
Recognize the importance of cyber threats and invest in cybersecurity preparedness measures on both sides of the border. Develop protocols, training programs, and information-sharing mechanisms to mitigate the risks of cyberattacks and ensure the resilience of critical infrastructure and essential services.

Promote Knowledge Sharing and Capacity Building:

Promote knowledge sharing and capacity building initiatives to empower local communities, emergency responders, and relevant stakeholders to effectively prepare for and respond to hazards. Organize training exercises, workshops, and awareness campaigns to enhance public awareness and resilience at the grassroots level.

Data availability/quality and resulting impact on reliability of the assessment

On the Spanish side of the border, data gaps exist in terms of biological risks because these risks are not covered by the national risk assessment of civil protection. Additionally, there are data gaps in societal risks due to a lack of evidence to support these risks. The justifications provided for risk assessment, exposure and impact predominantly stem from official public sources. The availability and quality of the data was sufficient, but not sufficient for the cyber risk. There is cooperation between Catalonia and the French regions close to the Spanish border. Cooperation takes the form of data sharing, particularly on seismic risks, wildfire and drought.



LEGEND

Each side of the petal represents a different risk level, with the smallest petal indicating a low risk level (1).

When risk groups have identical values, they are depicted within the same petal, segmented by the color associated with each risk group.


Probability (P):
1 - low
5 - high

Impact (I):
1 - low
5 - high

		Probability		Impact		Capability
		Spain	France	Spain	France	Average
Meteorological and hydrological	extreme weather	3	3	2.17	2.17	3
	flooding	3	3	2.17	1.83	1.5
	drought	4	4	2.33	2.17	2
	wild fire	3	4	2.5	3	2.5
Geohazards	geophysical risk	4	3	2.67	2	4
Biological	epidemics/pandemics	-	2	-	2	0
	animal & plant diseases	-	2	-	1.33	0
Technological	nuclear & radiological accidents	1	1	1	1	0
	disruption of critical infrastructure	1	3	3	3.17	0
Societal	terrorism	1	4	3	3.83	0
	cyber threats	1	3	2	3	0
	migration	1	4	2.33	3	0

ORANGE: high probability (3 or higher) and low capability (1.5 or lower)
RED: high impact (3 or higher) and low capability (1.5 or lower)
DARK RED: low capability comes along with both high probability and high impact

Table 22 SPAIN - PORTUGAL

SPAIN - PORTUGAL	 
<p><u>Overall review of risks</u></p> <p>All meteorological and hydrological hazards are, overall, above average, with limited or no discrepancy across the border. Data on biological and societal risks is missing from both sides of the border.</p>	
<p><u>Discrepancies in risk assessment</u></p> <p>There is very limited discrepancy in the risk assessments across hazards from the two sides of the border. The only exception is Disruption of critical Infrastructure, which is rated slightly higher in Portugal than in Spain.</p>	
<p><u>Exposures and vulnerabilities</u></p> <p>The most significant exposure and vulnerability effects on both sides of the border are observed concerning meteorological and hydrological risks. Disparities exist in terms of the identified exposure and vulnerability of nuclear and radiological accidents, which are evaluated as high on the Portuguese side of the border and low on the Spanish side.</p>	
<p><u>Potential impact</u></p> <p>The potential impacts on both sides of the border are primarily observed in relation to the economy, security of supply, infrastructure, functional capacity of the population, and services. Less impact is observed on international and EU activities, defence capability, and internal security. The assessment on both sides of the border is largely aligned, with the Portuguese side of the border reporting slightly higher impacts of meteorological and hydrological risks (with the exception of flooding).</p>	
<p><u>Governance readiness and gaps</u></p> <p>Spain appears ready to address meteorological and hydrological risks, except for extreme weather, and nuclear threats. Governance capabilities generally appear more limited on the Portuguese side, apart from flooding and wildfires.</p>	
<p><u>Availability/gaps of cross-border tools/agreements</u></p> <p>Cross-border cooperation between Spain and Portugal is well-defined in terms of existing agreements and working models. Existing bilateral agreements cover all regions of Spain and Portugal, with the cross-border mutual assistance protocol on a national level encompassing the entire cross-border territory.</p>	
<p><u>Recommendations</u></p> <p>Address Discrepancies in Risk Assessment:</p> <p>Investigate and reconcile discrepancies in the assessment of disruption of critical infrastructure between Spain and Portugal. This could involve conducting joint risk assessments, sharing data and expertise, and fostering dialogue between relevant authorities on both sides of the border.</p> <p>Strengthen Management of Meteorological and Hydrological Risks:</p> <p>Focus efforts on strengthening the management of meteorological and hydrological risks, which are identified as above average on both sides of the border. Develop comprehensive risk mitigation strategies, early warning systems, and emergency response plans tailored to address extreme weather events, drought, flooding, and other related hazards.</p> <p>Enhance Governance Structures for Nuclear Threats:</p> <p>Improve governance capabilities for addressing nuclear and radiological accidents, particularly on the Portuguese side of the border where higher exposure and vulnerability effects are observed. Invest in training, capacity building, and coordination mechanisms to ensure effective preparedness and response measures are in place to mitigate the impacts of such risks.</p> <p>Improve Data Availability and Quality:</p> <p>Address data gaps and limitations, particularly regarding biological risks and societal hazards on both sides of the border. Enhance collaboration between national risk assessment agencies, civil protection authorities, and other relevant stakeholders to collect, analyse, and share data on emerging threats and vulnerabilities.</p> <p>Strengthen Cross-Border Cooperation:</p> <p>Build upon existing agreements and working models to enhance cross-border cooperation and coordination between Spain and Portugal. Foster collaboration between regional authorities, emergency services, and</p>	

SPAIN - PORTUGAL



other stakeholders to exchange best practices, share resources, and implement joint projects aimed at improving disaster resilience.

Invest in Governance for Drought Management:

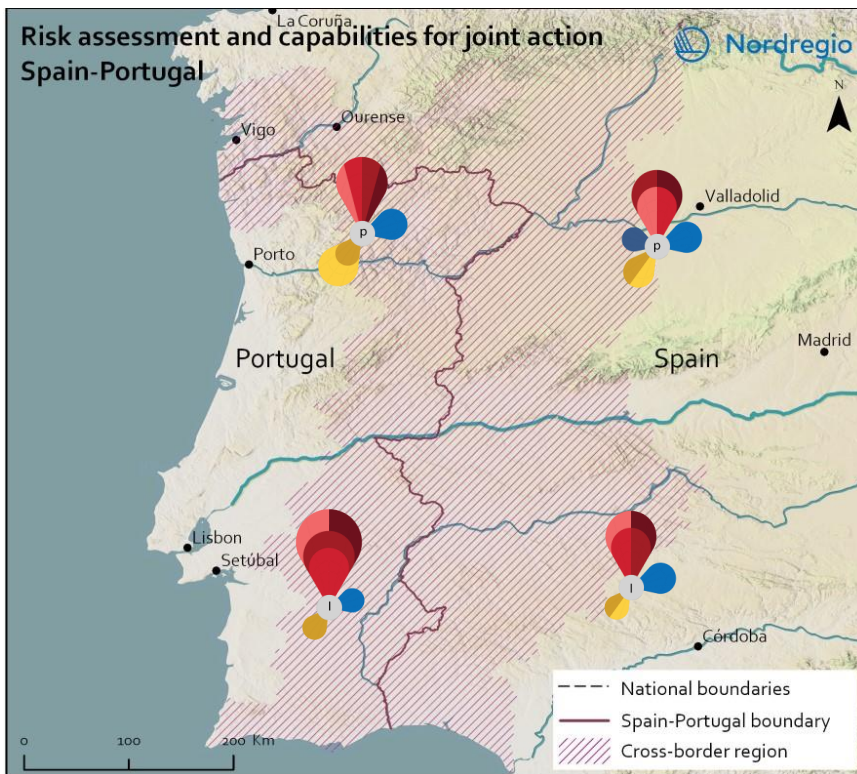
Recognize the importance of drought management and invest in governance structures and capabilities to address this hazard effectively. Support ongoing regional processes in both countries, such as those in Alentejo, Algarve, and Andalucía, with additional resources and attention to ensure comprehensive drought preparedness and response measures are in place.

Promote Knowledge Sharing and Capacity Building:

Promote knowledge sharing and capacity building initiatives to empower local communities, emergency responders, and relevant stakeholders to effectively prepare for and respond to hazards. Organize training exercises, workshops, and awareness campaigns to enhance public awareness and resilience at the grassroots level.

Data availability/quality and resulting impact on reliability of the assessment

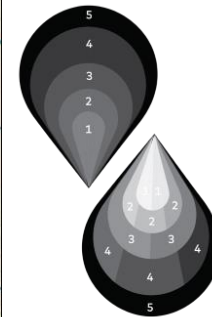
On both sides of the border, data gaps exist in terms of biological risks because these risks are not covered by the national risk assessment of civil protection. Additionally, there are data gaps in societal risks due to a lack of evidence to support these risks. On both sides of the border the justifications provided for risk assessment, exposure and impact predominantly stem from official public sources (national risk assessments, regional risks assessments, public geo-information portals).



LEGEND

Each side of the petal represents a different risk level, with the smallest petal indicating a low risk level (1).

When risk groups have identical values, they are depicted within the same petal, segmented by the color associated with each risk group.




Probability (P):
1 - low
5 - high

Impact (I):
1 - low
5 - high

		Probability		Impact		Capability
		Spain	Portugal	Spain	Portugal	Average
Meteorological and hydrological	extreme weather	3	4	3.5	5	0.5
	flooding	3	4	3.33	2.83	2.5
	drought	4	4	3	3.5	1.5
	wild fire	4	4	4	5	2.5
Geohazards	geophysical risk	2	2	2	1.33	0.5
Biological	epidemics/pandemics	-	-	-	-	0
	animal & plant diseases	-	-	-	-	0
Technological	nuclear & radiological accidents	2	3	1	-	1
	disruption of critical infrastructure	2	1	1	1	0
Societal	terrorism	1	-	-	-	0
	cyber threats	-	-	-	-	0
	migration	-	-	-	-	0

ORANGE: high probability (3 or higher) and low capability (1.5 or lower)
RED: high impact (3 or higher) and low capability (1.5 or lower)
DARK RED: low capability comes along with both high probability and high impact

Table 23 FINLAND - NORWAY

FINLAND - NORWAY	 
<p><u>Overall review of risks</u></p> <p>All risks are identified as high risk with average above 3.5 except for geophysical risks, nuclear/radiological risks, and terrorism. The most relevant risks are: Cyber threats (5); Flooding (4.5); Wildfires (4.5); Disruption of critical infrastructure (4.5); Migration (4.5).</p>	
<p><u>Discrepancies in risk assessment</u></p> <p>The probability of risks occurring is similar across borders, with the exceptions of: Extreme weather (5 Finland, 3 Norway); Drought (5 Finland, 2 Norway); Geophysical risks (4 Finland, 2 Norway); Nuclear / radiological accidents (4 Finland, 2 Norway).</p>	
<p><u>Exposures and vulnerabilities</u></p> <p>The exposure to wildfires is assessed as high on both sides of the border, as well as to nuclear and radiological accidents to some extent. The exposure to geophysical risks and terrorism is assessed as high in Finland and low in Norway.</p>	
<p><u>Potential impact</u></p> <p>There are discrepancies in the assessment on both side of the border. For Norway, the potential impact of disruption of critical infrastructure and epidemics and pandemics is considered high. For Finland, it is wildfires, geophysical risks, nuclear and radiological accidents, and terrorism that are considered medium to high impact.</p>	
<p><u>Governance readiness and gaps</u></p> <p>There are limited governance gaps across impactful hazards on the two sides of the border. Cooperation among rescue services is established within the Nordred framework, alongside the previously active Barents Rescue initiative. The recent establishment of the Governors North further strengthens the governance capabilities to address a diverse range of risks.</p>	
<p><u>Availability/gaps of cross-border tools/agreements</u></p> <p>The ability to collectively manage risks is considerably enhanced by existing frameworks for cross-border collaboration, such as Governors North, a platform for civil protection that is anchored at the regional level. The cross-border regions' increased emphasis on civil preparedness and total defence in recent years has channelled additional resources into the area. This holds the potential to further bolster joint approaches to risk management and emergency response.</p>	
<p><u>Recommendations</u></p> <p>Address Discrepancies in Risk Assessment:</p> <p>Investigate and reconcile discrepancies in the assessment of extreme weather, drought, geophysical risks, and nuclear/radiological accidents between Finland and Norway. This could involve conducting joint risk assessments, sharing data and expertise, and fostering dialogue between relevant authorities on both sides of the border.</p> <p>Strengthen Management of High-Impact Hazards:</p> <p>Focus efforts on strengthening the management of hazards with high potential impact, such as wildfires, disruption of critical infrastructure, and epidemics/pandemics. Develop comprehensive risk mitigation strategies, early warning systems, and emergency response plans tailored to address these risks effectively.</p> <p>Enhance Governance Structures and Capabilities:</p> <p>Further strengthen governance structures and capabilities to address a diverse range of risks, including wildfires and animal and plant diseases. Invest in training, capacity building, and coordination mechanisms to ensure effective preparedness and response measures are in place on both sides of the border.</p> <p>Promote Cross-Border Collaboration:</p> <p>Build upon existing frameworks for cross-border collaboration, such as Governors North, to enhance joint approaches to risk management and emergency response. Foster collaboration between regional authorities, rescue services, and other stakeholders to exchange best practices, share resources, and implement joint projects aimed at improving disaster resilience.</p>	

FINLAND - NORWAY



Explore Opportunities for Additional Tools and Processes:

Identify opportunities for developing additional tools, agreements, and processes to address emerging risks and vulnerabilities, particularly in areas where gaps have been identified, such as wildfires and animal and plant diseases. Foster innovation and collaboration to develop new approaches and solutions to enhance cross-border cooperation.

Ensure Data Availability and Quality:

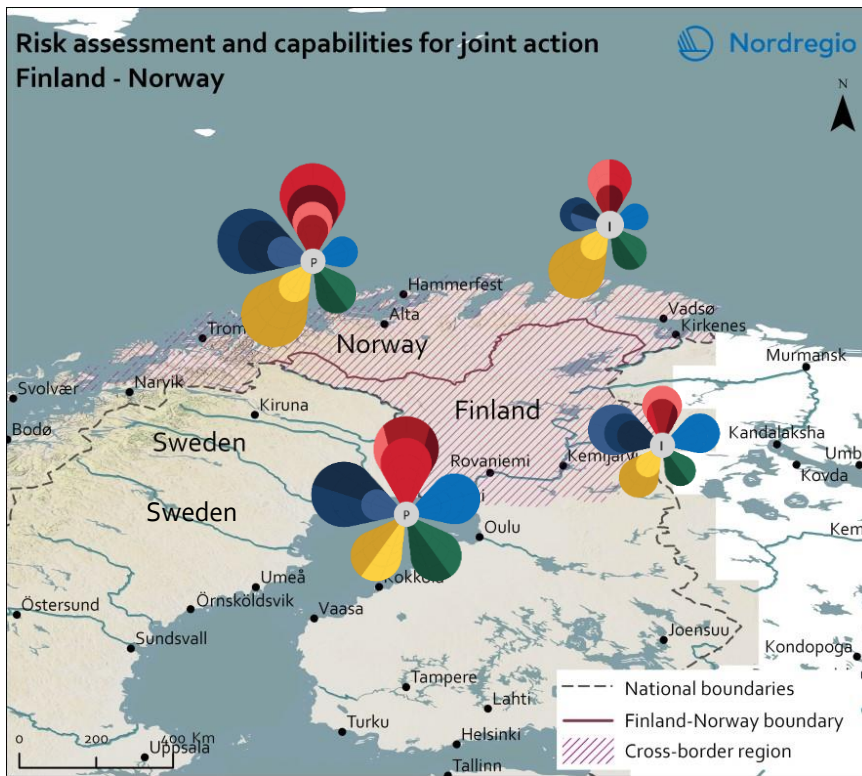
Continue to ensure the availability and quality of data for risk assessment and decision-making purposes. Invest in data collection, analysis, and sharing mechanisms to facilitate evidence-based risk management strategies and enhance the reliability of assessments on both sides of the border.

Regular Review and Update of Strategies:

Regularly review and update risk mitigation strategies, emergency response plans, and governance frameworks based on lessons learned from past incidents and evolving threats. Foster a culture of continuous improvement and innovation to adapt to changing circumstances and emerging challenges.

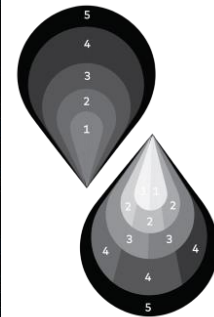
Data availability/quality and resulting impact on reliability of the assessment

For Finland, the availability and quality of the data was sufficient. The analysis draws mainly from the regional risk assessments. For Norway, the availability and quality of the data was sufficient. The analysis draws mainly from the county RVA, complemented by expert interviews.



LEGEND
 Each side of the petal represents a different risk level, with the smallest petal indicating a low risk level (1).

When risk groups have identical values, they are depicted within the same petal, segmented by the color associated with each risk group.





Probability (P):
 1 - low
 5 - high

Impact (I):
 1 - low
 5 - high

		Probability		Impact		Capability
		Finland	Norway	Finland	Norway	Average
Meteorological and hydrological	extreme weather	5	3	2.67	2.67	1
	flooding	4	5	2	2.67	1
	drought	5	2	1.5	1.33	0
	wild fires	5	4	1.67	1.33	0
Geohazards	geophysical risk	4	2	3.17	1	1
Biological	epidemics / pandemics	4	3	2	2.33	2
	animal & plant diseases	4	3	1.67	1.67	0
Technological	nuclear & radiological emergencies	4	2	1.17	1.33	3
	disruption of critical infrastructure	4	5	3.17	4.17	3
Societal	terrorism	2	2	3.67	1.17	1
	cyber threats	5	5	2.83	2.17	1
	migration	5	4	2	1	3

ORANGE: high probability (3 or higher) and low capability (1.5 or lower)
RED: high impact (3 or higher) and low capability (1.5 or lower)
DARK RED: low capability comes along with both high probability and high impact

Table 24 FRANCE - BELGIUM

FRANCE - BELGIUM	 
<p><u>Overall review of risks</u></p> <p>There are several hazards that are considered of medium-high probability in this border: Extreme weather; Flooding; Geophysical risks; Terrorism; Cyber-threats.</p>	
<p><u>Discrepancies in risk assessment</u></p> <p>Discrepancies in assessment are mostly limited, except for epidemics/pandemics (4 Belgium, 2 France).</p>	
<p><u>Exposures and vulnerabilities</u></p> <p>The border region has a high concentration of population, industry and employment. Thus, some risks, such as flooding, extreme weather, terrorism and nuclear and radiological incidents, are considered to have a medium-high level of exposure.</p>	
<p><u>Potential impact</u></p> <p>There are several hazards that are considered of medium-high impact on the French side of the border: most significantly flooding, but also terrorism and cyber threats, which have medium-high risks throughout France and Belgium. Disruption of critical infrastructure is also assessed with a relatively important impact in Belgium due to the high industrialization of the zone.</p>	
<p><u>Governance readiness and gaps</u></p> <p>There are limited governance gaps across impactful hazards on the two sides of the border. The most significant gaps are in epidemic/pandemic coordination, geophysical risks and cyberthreats. These risks are either extremely localised (subsidence – geophysical risks) or not localised to a single border (cyberthreats and epidemic/pandemics). Other risks for which there is no joint governance are wildfires, animal and plant disease, and disruption of critical infrastructure.</p>	
<p><u>Availability/gaps of cross-border tools/agreements</u></p> <p>There are several agreements on major risks, such as flooding (International Commission of the Meuse) and terrorism. General agreements on post-crisis cooperation exist. However, cross-border tools and agreements are missing or insufficient for a series of hazards: wildfires, biological risks, nuclear and radiological accidents, disruption of critical infrastructure, terrorism and cyber threat.</p>	
<p><u>Recommendations</u></p> <p>Address Discrepancies in Risk Assessment:</p> <p>Investigate and reconcile discrepancies in the assessment of epidemics/pandemics between France and Belgium. Conduct joint risk assessments and share data to ensure a comprehensive understanding of the potential risks and impacts in the border region.</p> <p>Strengthen Management of High-Impact Hazards:</p> <p>Focus efforts on strengthening the management of hazards with medium-high impact, such as flooding, terrorism, and cyber threats. Develop and implement comprehensive risk mitigation strategies, emergency response plans, and coordination mechanisms to address these risks effectively.</p> <p>Enhance Governance Structures and Capabilities:</p> <p>Address governance gaps in epidemic/pandemic coordination, geophysical risks, and cyber threats. Establish joint governance structures and protocols for cross-border cooperation, including mechanisms for information sharing, coordination of response efforts, and mutual assistance during emergencies.</p> <p>Promote Cross-Border Collaboration:</p> <p>Build upon existing agreements and frameworks for cross-border collaboration, such as the International Commission of the Meuse for flooding and agreements on post-crisis cooperation. Strengthen partnerships between regional authorities, emergency services, and other stakeholders to enhance joint preparedness and response to various hazards.</p> <p>Develop Cross-Border Tools and Agreements:</p> <p>Identify and develop additional cross-border tools and agreements to address gaps in risk management, particularly for hazards such as wildfires, biological risks, nuclear and radiological accidents, disruption of critical infrastructure, terrorism, and cyber threats. Foster collaboration and information sharing to improve readiness and resilience.</p>	

FRANCE - BELGIUM



Focus on Strengthening Governance Capabilities:

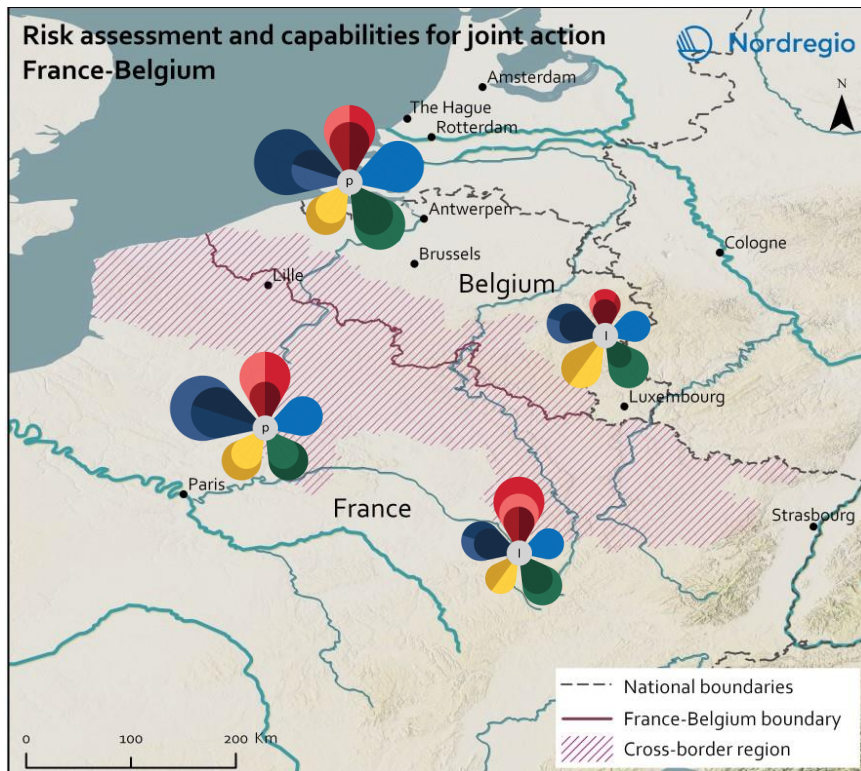
Consider measures to strengthen governance capabilities in the border region to address extreme weather, geophysical risks, and societal risks. Invest in training, capacity building, and coordination mechanisms to enhance preparedness and response capabilities on both sides of the border.

Ensure Data Availability and Quality:

Improve data availability and quality for risk assessment and decision-making purposes, particularly for hazards such as migration, terrorism, epidemics/pandemics, animal and plant diseases, and disruption of critical infrastructure. Enhance collaboration between relevant agencies to share data and expertise.

Data availability/quality and resulting impact on reliability of the assessment

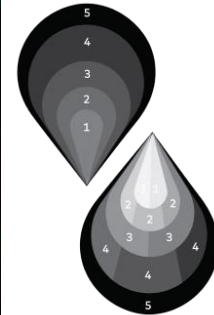
The French data availability was sufficient across most risks, with the exception of migration, terrorism, epidemics/pandemics, animal and plant diseases and disruption of critical infrastructure as these risks are not typically assessed on a risk scale and by border. Additionally, some agreements may not be public (e.g., terrorism). Wildfire and migration risks are not assessed in the Belgian National Risk Assessment – alternative sources were used (Thinkhazard, EFFIS).



LEGEND

Each side of the petal represents a different risk level, with the smallest petal indicating a low risk level (1).

When risk groups have identical values, they are depicted within the same petal, segmented by the color associated with each risk group.





Probability (P):
1 - low
5 - high

Impact (I):
1 - low
5 - high

		Probability		Impact		Capability
		France	Belgium	France	Belgium	Average
Meteorological and hydrological	extreme weather	4	4	3	2.17	1.5
	flooding	4	4	3.5	2	2.5
	drought	2	3	2	1.83	1
	wild fire	2	3	2	1.33	0
Geohazards	geophysical risk	3	4	1.67	2.17	0
Biological	epidemics/pandemics	2	4	2.5	2.67	0
	animal & plant diseases	3	3	2	1.33	0
Technological	nuclear & radiological accidents	2	2	2	2.5	0.5
	disruption of critical infrastructure	3	3	2	2.67	0
Societal	terrorism	5	3	3.33	2.83	1.5
	cyber threats	4	5	2.83	2.5	0
	migration	4	3	2.33	1.67	1.5

ORANGE: high probability (3 or higher) and low capability (1.5 or lower)
RED: high impact (3 or higher) and low capability (1.5 or lower)
DARK RED: low capability comes along with both high probability and high impact

Table 25 FRANCE - SWITZERLAND

FRANCE - SWITZERLAND	 
<p><u>Overall review of risks</u></p> <p>With the exception of geophysical risks, all hazards along this border are considered to have an average or low probability.</p>	
<p><u>Discrepancies in risk assessment</u></p> <p>The discrepancies between the two sides of the border are non-existing or small, apart from Extreme weather and mass migration, ranked higher in France than in Switzerland.</p>	
<p><u>Exposures and vulnerabilities</u></p> <p>Meteorological risks (extreme temperatures, flooding, earthquakes) are the greatest, due to the area's geography and demography. On the Swiss side, production capacities including agriculture are highly exposed to flooding and drought. Housing is exposed mostly to flooding and epidemics. The risks associated with migratory movements are assessed by the French border to be particularly high due to cross-border flows.</p>	
<p><u>Potential impact</u></p> <p>The impact is particularly significant because of the high population density between Switzerland and France. Considering the geography of the border and existence of catchments key for transport sector, flooding and disruption of key infrastructure would have a high impact on the functional capacity of the population and infrastructure.</p>	
<p><u>Governance readiness and gaps</u></p> <p>Governance readiness varies across the hazards, without any clear pattern emerging. In general, the collaboration between Switzerland and France is well established, counting 5 bilateral agreements (two on nuclear and radiological accidents) and one multilateral agreement (with Germany).</p>	
<p><u>Availability/gaps of cross-border tools/agreements</u></p> <p>Cooperation is bilateral, with specific agreements between Switzerland and France. Switzerland's non-membership of the European Union and the Schengen zone complicates the management of cross-border flows. However, France and Switzerland have a series of tools/institutions at disposal available at a multi-border level, for the prevention (multi-risks, droughts, flooding) and preparedness (flooding, multi-risks, wildfires, droughts) phases.</p>	
<p><u>Recommendations</u></p> <p>Address Discrepancies in Risk Assessment:</p> <p>Investigate the differences in risk assessments for extreme weather and mass migration between France and Switzerland. Conduct joint assessments to harmonize risk perceptions and develop a shared understanding of potential hazards.</p> <p>Strengthen Governance Capabilities:</p> <p>Enhance governance readiness to address geophysical risks, extreme weather events, and mass migration. Establish collaborative frameworks and protocols for cross-border coordination and information sharing, particularly in areas where discrepancies exist.</p> <p>Improve Cross-Border Cooperation:</p> <p>Strengthen bilateral agreements and collaboration mechanisms between France and Switzerland. Foster closer ties between relevant agencies, emergency services, and stakeholders to facilitate joint preparedness and response efforts.</p> <p>Enhance Data Sharing and Analysis:</p> <p>Establish common platforms for the rapid and efficient sharing of data on natural hazards. Promote the exchange of information and expertise to improve the accuracy and reliability of risk assessments on both sides of the border.</p> <p>Develop Emergency Plans and Scenarios:</p> <p>Collaboratively develop emergency plans and natural risk management scenarios that consider the geographical and meteorological specificities of both countries. Conduct joint exercises and drills to test response capabilities and enhance readiness.</p>	

FRANCE - SWITZERLAND



Explore Implementation of Projects:

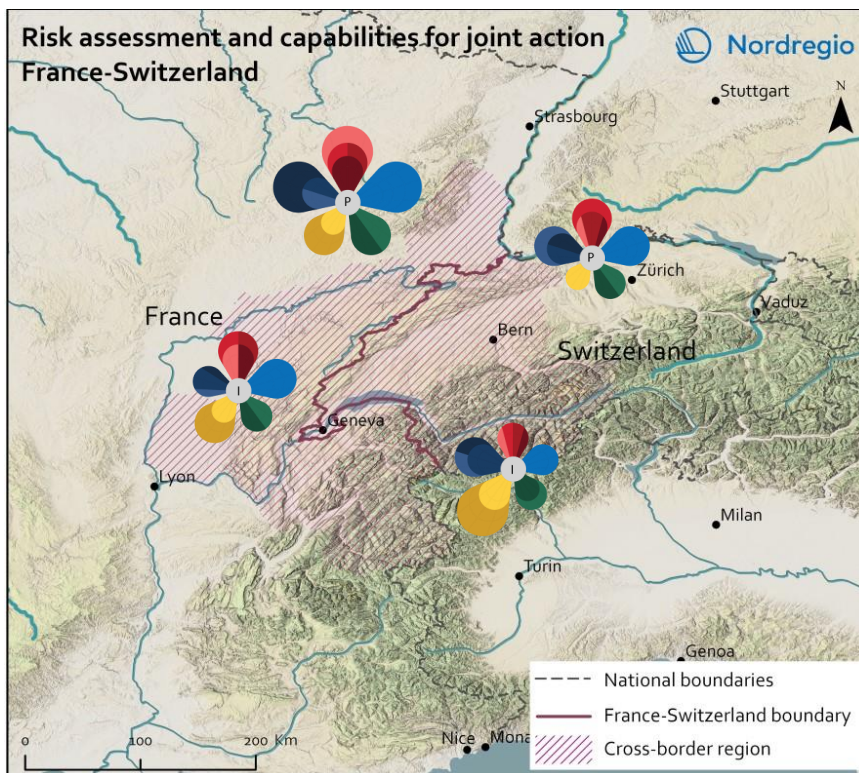
Explore the implementation of projects aimed at enhancing the response to disaster risks, particularly in areas identified as priorities such as geophysical risks. Allocate resources and funding for joint initiatives focused on risk mitigation and preparedness.

Ensure Data Availability and Quality:

Improve data availability and quality, particularly for hazards such as terrorism and cybercrime. Enhance transparency and accessibility of risk assessment data to facilitate informed decision-making and policy development.

Data availability/quality and resulting impact on reliability of the assessment

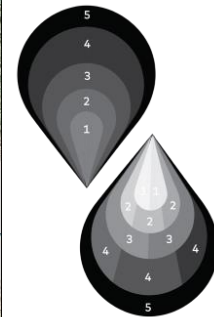
The data available on the French side is sufficient. However, data on the risks associated with terrorism and cybercrime is not publicly available. For the Swiss border, the risk assessment scores for some hazards are missing due to the lack of publicly available data (biological and technological). Also, all the scores included for the Swiss side are qualitative and subjective, as the NRA does not include a specific quantitative assessment on this border and the other documents consulted provide information not fully in line with the methodology used in this study. The authors evaluated the scores based on publicly available data and information.



LEGEND

Each side of the petal represents a different risk level, with the smallest petal indicating a low risk level (1).

When risk groups have identical values, they are depicted within the same petal, segmented by the color associated with each risk group.





Probability (P):
1 - low
5 - high

Impact (I):
1 - low
5 - high

		Probability		Impact		Capability
		France	Switzerland	France	Switzerland	Average
Meteorological and hydrological	extreme weather	4	2	2	2.17	2.5
	flooding	3	3	3	2.17	2
	drought	3	2	3	1.67	1.5
	wild fires	2	2	2	1.5	1.5
Geohazards	geophysical risk	4	3	3	2	2
Biological	epidemics / pandemics	3	2	2.33	2.17	0.5
	animal & plant diseases	3	2	2	1.33	0.5
Technological	nuclear & radiological emergencies	1	1	1	2	2
	disruption of critical infrastructures	3		3	4	0.5
Societal	terrorism	2	3	2.33	3	1.5
	cyber threats	2	2	2	2	1.5
	migration	4	2	2.33	3	2

ORANGE: high probability (3 or higher) and low capability (1.5 or lower)
RED: high impact (3 or higher) and low capability (1.5 or lower)
DARK RED: low capability comes along with both high probability and high impact

Table 26 FRANCE - GERMANY

FRANCE - GERMANY	 
<p><u>Overall review of risks</u></p> <p>Several Meteorological and hydrological risks, together with Terrorism and Cyber threats are scored as highly probable across both sides of the border. The risks of Epidemics/pandemics is slightly above average.</p>	
<p><u>Discrepancies in risk assessment</u></p> <p>There are at most minor discrepancies in the assessment of all hazards.</p>	
<p><u>Exposures and vulnerabilities</u></p> <p>The region is most at risk of flooding on both sides of the border, due to high concentration of affected population and economic activity. The German side also considers itself to be highly vulnerable to epidemics/pandemics and technological disasters.</p>	
<p><u>Potential impact</u></p> <p>Flooding is considered to be the risk with the highest impact on both sides of the border.</p>	
<p><u>Governance readiness and gaps</u></p> <p>With the exception of flooding (most impactful risk on the French side of the border) and nuclear and radiological risks, in which both sides have multiple agreements, the rest of the hazards present some governance gaps. General agreements on post-crisis cooperation (emergency services) also exist.</p>	
<p><u>Availability/gaps of cross-border tools/agreements</u></p> <p>There are neither treaties nor initiatives in the area of geohazards and biological disasters. In the case of cyber threats, there is only the multilateral Convention on Cybercrime.</p>	
<p><u>Recommendations</u></p> <p>Joint Measures for Risk Management:</p> <p>Consider joint measures for managing extreme weather events, drought, epidemics/pandemics, cyber threats, and terrorism. Establish bilateral or multilateral agreements to facilitate information sharing, resource allocation, and coordinated response efforts.</p> <p>Address Governance Gaps:</p> <p>Identify and address governance gaps in areas such as geohazards, biological disasters, and cyber threats. Develop cross-border frameworks and protocols for effective coordination and collaboration among relevant agencies and stakeholders.</p> <p>Expand Cross-Border Tools and Agreements:</p> <p>Enhance cross-border cooperation by establishing treaties and initiatives in critical areas such as geohazards, biological disasters, and cyber threats. Strengthen existing agreements and explore opportunities for new partnerships to address emerging risks.</p> <p>Focus on High-Impact Risks:</p> <p>Prioritize efforts to manage high-impact risks such as flooding, which poses significant threats to both sides of the border. Develop joint strategies for flood prevention, mitigation, and response to minimize the potential impact on affected populations and infrastructure.</p> <p>Improve Data Availability and Quality:</p> <p>Enhance data availability and quality, particularly for risks such as migration, terrorism, epidemics/pandemics, animal and plant diseases, and disruption of critical infrastructure. Promote transparency and collaboration to ensure that risk assessments are based on reliable and up-to-date information.</p> <p>Enhance Regional Collaboration:</p> <p>Foster closer collaboration at the regional level to strengthen resilience and preparedness for disasters. Facilitate the exchange of best practices, lessons learned, and expertise among neighbouring regions to enhance collective response capabilities.</p>	

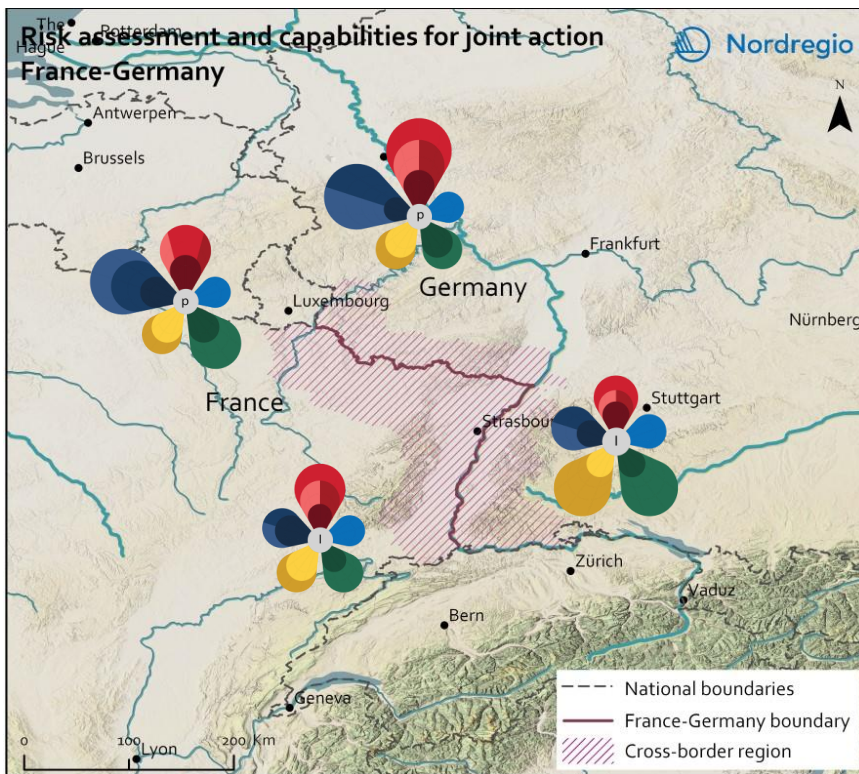
FRANCE - GERMANY



Data availability/quality and resulting impact on reliability of the assessment

The French data availability was sufficient across most risks, with the exception of migration, terrorism epidemics/pandemics, animal and plant diseases and disruption of critical infrastructure as these risks are not typically assessed on a risk scale and by border. Additionally, some agreements may not be public (e.g., terrorism).

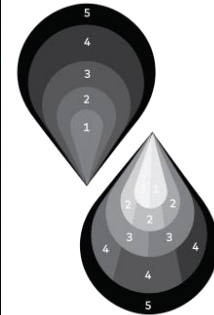
For Germany, the availability and quality of data on natural disasters is high. The analysis is mainly based on the national risk assessments of the responsible authorities, which are also partly based on GIS visualisation. Risk analyses on animal and plant diseases were of high quality and are regularly updated. Regarding man-made disasters such as nuclear accidents, the disruption of critical infrastructure, terrorism and cyber-attacks, as well as epidemics/pandemics, it was only possible to draw on national analyses that were not region-specific.



LEGEND

Each side of the petal represents a different risk level, with the smallest petal indicating a low risk level (1).

When risk groups have identical values, they are depicted within the same petal, segmented by the color associated with each risk group.





Probability (P):
1 - low
5 - high

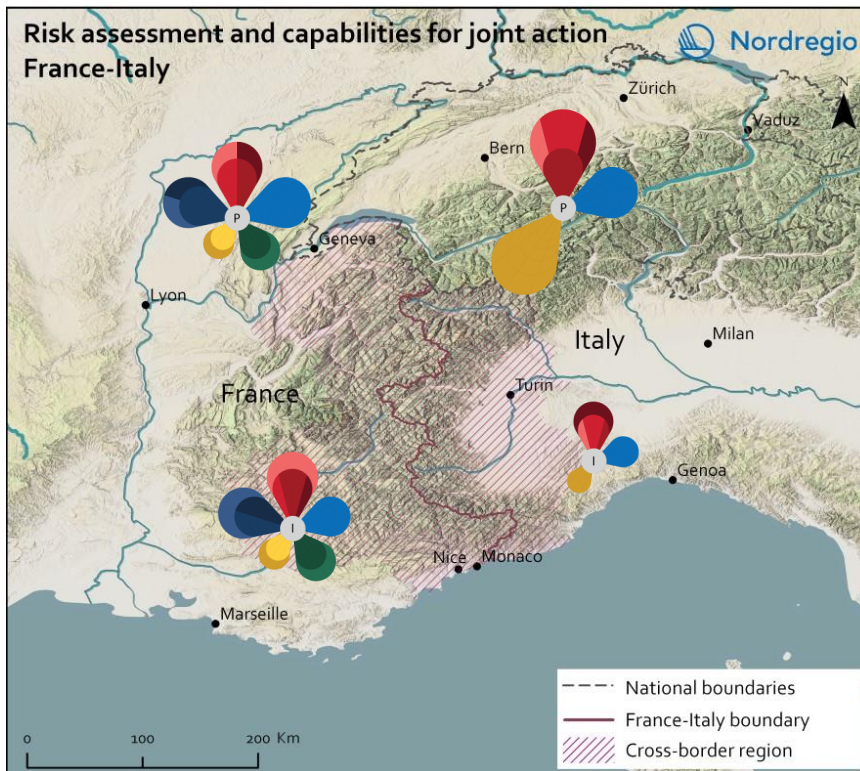
Impact (I):
1 - low
5 - high

ORANGE: high probability (3 or higher) and low capability (1.5 or lower)
RED: high impact (3 or higher) and low capability (1.5 or lower)
DARK RED: low capability comes along with both high probability and high impact

		Probability		Impact		Capability
		France	Germany	France	Germany	Average
Meteorological and hydrological	extreme weather	4	4	3	2	1
	flooding	4	5	3.5	3.17	3
	draught	4	4	3.17	2	0
	wild fire	2	2	1.33	1.33	1
Geohazards	geophysical risk	2	2	1.5	1.5	0
Biological	epidemics/pandemics	4	3	3	3.67	0
	animal & plant diseases	2	2	1	1	0
Technological	nuclear & radiological emergencies	2	2	2	1.33	1.5
	disruption of critical infrastructure	3	3	3	4	0
Societal	terrorism	5	5	3.33	3.33	0
	cyber threats	4	5	3	3	0.5
	migration	2	1	2	1	0

Table 27 FRANCE - ITALY

FRANCE - ITALY	 
<p><u>Overall review of risks</u></p> <p>With the exception of drought, the remaining hazards are all classified as average/above average.</p>	
<p><u>Discrepancies in risk assessment</u></p> <p>There are discrepancies in the assessment of four out of six hazards, mainly due to subjectivity in the evaluation, which was necessary due to the lack of public available data and/or specific information at the border. The difference is particularly large in "Disruption of Critical Infrastructure", in which the risk is 5 for Italy and 2 for France. Similarly, regarding flooding, for Italy the probability is rated as very high (5), whereas for France as average (3).</p>	
<p><u>Exposures and vulnerabilities</u></p> <p>For the Italian side, the presence of urban areas and infrastructures near the border makes this area exposed and vulnerable to hazards including wildfires, geophysical risks and flooding.</p>	
<p><u>Potential impact</u></p> <p>On the Italian side, given the systemic nature of most of the risks considered, most sectors of society could be impacted at the border.</p>	
<p><u>Governance readiness and gaps</u></p> <p>The governance of DRM at the border between Italy and France seems to be well-developed, also considering the high number of existing bilateral agreements covering different types of risks, including multi-risks.</p>	
<p><u>Availability/gaps of cross-border tools/agreements</u></p> <p>A high number of cooperation agreements, joint projects and initiatives exist, enabling the French-Italian services to take proper account of the different risks involved.</p>	
<p><u>Recommendations</u></p> <p>Address Discrepancies in Risk Assessment:</p> <p>Enhance collaboration and information sharing between France and Italy to address discrepancies in risk assessment. Establish standardized methodologies for risk evaluation to ensure consistency and accuracy in the assessment of hazards and their potential impacts.</p> <p>Focus on High-Priority Risks:</p> <p>Prioritize efforts to manage high-priority risks such as wildfires, extreme weather events (especially heat waves), flooding, and geophysical risks. Develop joint strategies and action plans to mitigate the impacts of these hazards on border communities and infrastructure.</p> <p>Enhance Data Availability and Quality:</p> <p>Improve data availability and quality, particularly for risks such as biological, technological, and societal risks. Establish mechanisms for sharing sensitive data related to societal risks, such as terrorism, while ensuring compliance with privacy and security regulations.</p>	
<p><u>Data availability/quality and resulting impact on reliability of the assessment</u></p> <p>For the French border, the data available takes full account of the risks. All the scores included for the Italian side are qualitative and subjective, as the NRA does not include a specific quantitative assessment on this border and/or does not assess specific risks, such as biological, technological as well as societal risks - data on societal risks, such as terrorism, are sensitive data and are not publicly available. At the same time, the other documents consulted provide information not fully in line with the methodology used in this study. Hence, when possible, the authors evaluated the scores based on publicly available data and information.</p>	



LEGEND

Each side of the petal represents a different risk level, with the smallest petal indicating a low risk level (1).

When risk groups have identical values, they are depicted within the same petal, segmented by the color associated with each risk group.



Probability (P):
1 - low
5 - high

Impact (I):
1 - low
5 - high



		Probability		Impact		Capability
		France	Italy	France	Italy	Average
Meteorological and hydrological	extreme weather	4	5	4	2	1
	flooding	3	5	3	2.33	1.5
	drought	3	3	3	1.5	2.5
	wild fire	4	5	3	2.5	2.5
Geohazards	geophysical risk	4	4	3	2	3
Biological	epidemics/pandemics	3	-	2.67	-	0.5
	animal & plant diseases	2	-	2	-	0
Technological	nuclear & radiological accidents	1	-	1	-	1
	disruption of critical infrastructure	2	5	2	1.33	2
Societal	terrorism	4	-	4	-	0
	cyber threats	3	-	3.17	-	0
	migration	4	-	3	-	0

ORANGE: high probability (3 or higher) and low capability (1.5 or lower)

RED: high impact (3 or higher) and low capability (1.5 or lower)

DARK RED: low capability comes along with both high probability and high impact

Table 28 FRANCE - LUXEMBURG

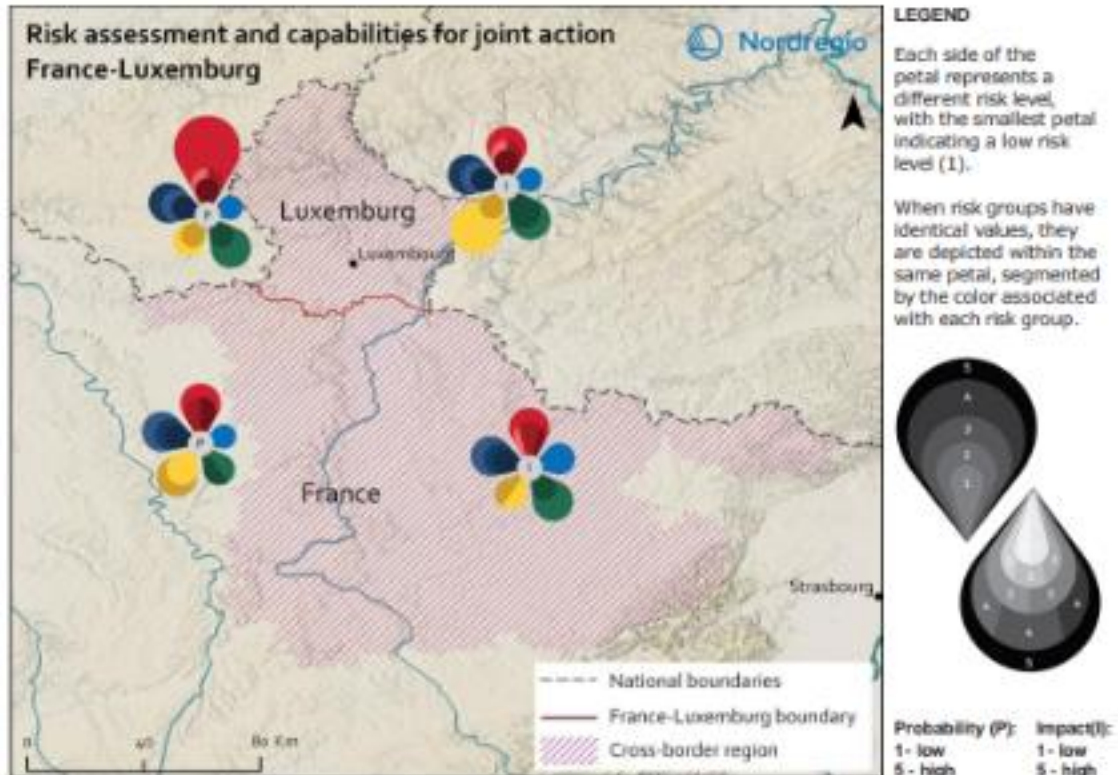
FRANCE - LUXEMBURG	 
<p><u>Overall review of risks</u></p> <p>From the expert review of existing risk assessments on both sides of the border, it appears that flooding is the only hazard having a higher-than-average probability of occurring.</p>	
<p><u>Discrepancies in risk assessment</u></p> <p>The assessments are the same or similar for most hazards, except for flooding (5 Luxembourg, 3 France) and disruption of critical Infrastructure (1 Luxembourg, 3 France).</p>	
<p><u>Exposures and vulnerabilities</u></p> <p>Luxembourg considers itself vulnerable to nuclear and radiological risks and epidemics and pandemics, while France considers itself vulnerable to flooding in the border region.</p>	
<p><u>Potential impact</u></p> <p>The only risk with an above average impact is nuclear and radiological incidents, on the Luxembourgish side of the border (risk from French Cattenom plant). Cyberattacks, epidemics and pandemics and flooding are other notable impacts on both sides of the border.</p>	
<p><u>Governance readiness and gaps</u></p> <p>Flooding is the hazard for which the governance structure in place across both sides of the border seems more comprehensive, although there are examples of agreements and cooperation also for the management of other hazards, e.g. Nuclear and radiological accidents (e.g., the SELCA system for the exchange of information between Cattenom and the border authorities). General agreements on post-crisis cooperation also exist.</p>	
<p><u>Availability/gaps of cross-border tools/agreements</u></p> <p>Very limited initiatives are identified across hazards on both sides of the border.</p>	
<p><u>Recommendations</u></p> <p>Address Discrepancies in Risk Assessment:</p> <p>Foster closer collaboration between France and Luxembourg to address discrepancies in risk assessment, particularly for hazards such as flooding and disruption of critical infrastructure. Establish joint methodologies and criteria for risk evaluation to ensure consistency and accuracy.</p> <p>Strengthen Governance and Cooperation:</p> <p>Build upon existing cross-border governance structures and cooperation measures, particularly for managing flooding and nuclear/radiological incidents. Enhance coordination mechanisms and information-sharing protocols to improve preparedness and response capabilities.</p> <p>Focus on High-Priority Risks:</p> <p>Prioritize efforts to strengthen the management of high-priority risks such as disruption of critical infrastructure and cyber threats. Develop joint action plans and contingency measures to mitigate the impacts of these hazards on border communities and essential services.</p> <p>Enhance Data Availability and Quality:</p> <p>Improve data availability and quality, especially for risks such as migration, terrorism, epidemics/pandemics, and animal and plant diseases. Establish mechanisms for sharing relevant data and information while ensuring compliance with privacy and security regulations.</p> <p>Promote Cross-Border Tools and Agreements:</p> <p>Explore opportunities to develop new cross-border tools and agreements for managing various hazards, including cyber threats and disruption of critical infrastructure. Enhance bilateral cooperation frameworks and establish joint initiatives to address shared challenges.</p> <p>Invest in Capacity Building:</p> <p>Invest in capacity building and training programs for relevant authorities and stakeholders involved in disaster risk management. Enhance the skills and expertise necessary for effective coordination, communication, and decision-making during emergencies.</p>	

FRANCE - LUXEMBURG



Data availability/quality and resulting impact on reliability of the assessment

The French data availability was sufficient across most risks, with the exception of migration, terrorism, epidemics/pandemics, animal and plant diseases and disruption of critical infrastructure as these risks are not typically assessed on a risk scale and by border. The Luxemburgish data quality was insufficient for the majority of risks, except terrorism, flooding and nuclear and radiological incidents. Additionally, some agreements may not be public (e.g., terrorism).



		Probability		Impact		Capability
		France	Luxembourg	France	Luxembourg	Average
Meteorological and hydrological		3	2	2.33	2	0.5
		3	5	3	3	3
		2	2	2	1.5	0
		2	1	2	1	0
Geohazards		1	1	1.5	1	0
Biological		2	3	3	2.67	0
		2	1	1	1.83	0
Technological		2	2	2	4	2
		3	1	2.17	1	0
Societal		3	2	2.67	2	0
		2	3	2	3	0
		1	1	1	1	0

ORANGE: high probability (3 or higher) and low capability (1.5 or lower)
RED: high impact (3 or higher) and low capability (1.5 or lower)
DARK RED: low capability comes along with both high probability and high impact

Table 29 CROATIA - SERBIA

CROATIA - SERBIA	
<u>Overall review of risks</u>	In this border only extreme weather and flooding are indicated as highly likely hazards.
<u>Discrepancies in risk assessment</u>	There is significant discrepancy in the assessments of various hazards. Flooding is scored as 5 in Croatia and as 2 in Serbia; Geophysical hazards are scored as 2 in Croatia and 3 in Serbia; Cyber threats and Migration are both scored as 3 in Croatia and as 1 in Serbia.
<u>Exposures and vulnerabilities</u>	In the context of the HR/SRB border, Serbia is vulnerable to extreme weather conditions, mostly floods, droughts and wildfires. Similarly, Croatia is vulnerable to extreme weather and consequently floods. Serbia being of the Western Balkan migration routes from South Europe and Middle East is affected by it. The border is now a Schengen area border and thus under strong pressure of illegal migration.
<u>Potential impact</u>	Extreme weather risks in Serbia could significantly impact the economy, households, and production, while in Croatia, extreme weather and floods can strongly affect agriculture, households, infrastructure, supply chains, and the economy. Additionally, cyberattacks, epidemics, and pandemics are notable risks from the Serbian side, while in Croatia, cyberattacks and migrations can also have significant impacts.
<u>Governance readiness and gaps</u>	On both sides of the border between HR and SRB, the governance capability to address risks jointly on the border seems to be overall weak across all hazards and limited to agreements. However, as regards cyber threats, the risk assessment concluded with the identification of the existence of some agreements.
<u>Availability/gaps of cross-border tools/agreements</u>	The HR/SRB border is lacking bilateral and cooperation agreements reflecting the extreme weather risks as well as cyberattacks, epidemics and pandemics cooperation agreements to provide the system and infrastructure for joint reaction and involvement in potential situations.
<u>Recommendations</u>	<p>Address Discrepancies in Risk Assessment:</p> <p>Foster dialogue between Croatia and Serbia to address discrepancies in risk assessment, particularly for hazards such as flooding and geophysical hazards. Establish joint methodologies and criteria for risk evaluation to ensure consistency and accuracy.</p> <p>Strengthen Governance and Cooperation:</p> <p>Enhance cross-border governance structures and cooperation mechanisms to improve preparedness and response capabilities. Establish joint committees or task forces to coordinate efforts, share information, and develop common strategies for disaster risk management.</p> <p>Focus on High-Priority Risks:</p> <p>Prioritize efforts to strengthen the management of high-priority risks such as extreme weather, flooding, and drought. Develop joint early warning systems, implement flood control measures, and coordinate drought mitigation strategies to minimize cross-border impacts.</p> <p>Data Sharing and Information Exchange:</p> <p>Facilitate data sharing and information exchange between Croatia and Serbia to support informed decision-making and coordinated response efforts. Establish a shared database for hazard mapping, vulnerability assessments, and incident reporting to enhance situational awareness and response coordination.</p> <p>Capacity Building and Technical Assistance:</p> <p>Invest in capacity building programs and provide technical assistance to build the skills and expertise of stakeholders involved in disaster risk management. Offer training workshops, exchange programs, and access to specialized resources and tools to enhance disaster preparedness and response capabilities.</p>

CROATIA - SERBIA



Enhance Public Awareness and Community Engagement:

Increase public awareness and community engagement initiatives on both sides of the border to promote disaster preparedness and resilience. Launch joint public awareness campaigns, community-based training programs, and collaboration with local stakeholders to develop and implement community-level disaster preparedness plans.

Promote Bilateral Agreements:

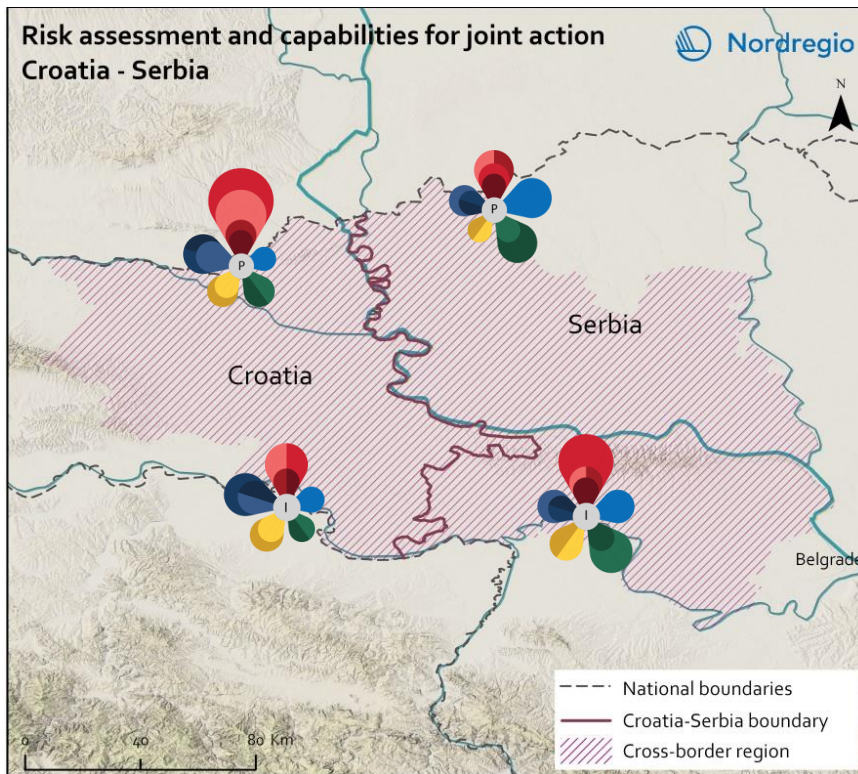
Advocate for the development of bilateral agreements between Croatia and Serbia to address specific risks and establish cooperation frameworks for disaster risk management. Prioritize the negotiation of agreements on extreme weather, cyber threats, epidemics/pandemics, and migration to facilitate joint response efforts.

Monitor and Evaluate Progress:

Establish mechanisms for monitoring and evaluating progress in implementing cross-border initiatives and achieving resilience objectives. Conduct regular reviews and assessments to identify areas for improvement and lessons learned.

Data availability/quality and resulting impact on reliability of the assessment

Data have been modest for potential risks, especially in cross-border region, reflecting the lack of bilateral agreements.



LEGEND

Each side of the petal represents a different risk level, with the smallest petal indicating a low risk level (1).

When risk groups have identical values, they are depicted within the same petal, segmented by the color associated with each risk group.

Probability (P):
 1 - low
 5 - high

Impact (I):
 1 - low
 5 - high



		Probability		Impact		Capability
		Croatia	Serbia	Croatia	Serbia	Average
Meteorological and hydrological	extreme weather	4	3	2.67	2.33	1
	flooding	5	2	3	4	1
	drought	2	3	1.33	2.33	0.5
	wild fire	1	1	1	0.67	1
Geohazards	geophysical risk	1	3	1.33	2.33	0.5
Biological	epidemics/pandemics	2	1	1.33	3.33	0.5
	animal & plant diseases	2	3	1.33	1.33	0.5
Technological	nuclear & radiological emergencies	1	1	1	2.33	0.5
	disruption of critical infrastructure	2	1	1.5	1.67	1
Societal	terrorism	2	2	2	2	1
	cyber threats	3	1	2.67	1	2
	migration	3	1	2	1	1.5

ORANGE: high probability (3 or higher) and low capability (1.5 or lower)

RED: high impact (3 or higher) and low capability (1.5 or lower)

DARK RED: low capability comes along with both high probability and high impact

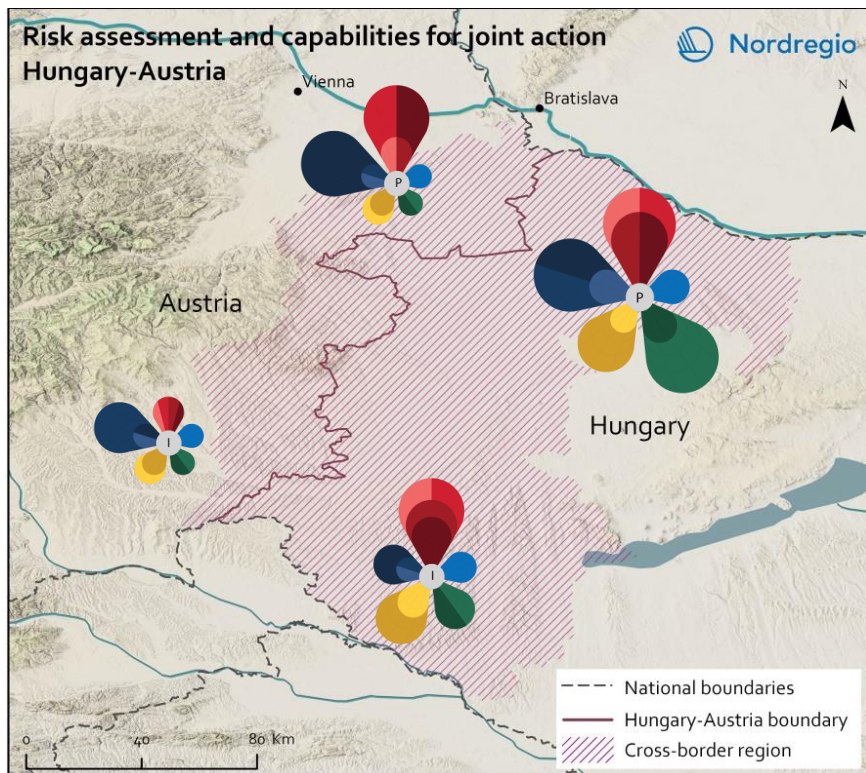
Table 30 HUNGARY - AUSTRIA

HUNGARY - AUSTRIA	 
<u>Overall review of risks</u>	
<p>Meteorological/Hydrological hazards are considered above average in the border, with some discrepancy across the two sides of the border, as well as epidemics/pandemics, cyber threats, and migration. The most relevant risks (average above 3) are: Flooding (5); Migration (5); Wildfires (4.5); Extreme weather (3.5); Epidemics/pandemics (3.5); Cyber threats (3).</p>	
<u>Discrepancies in risk assessment</u>	
<p>For both sides of the border flooding and migration have been assessed at the highest probability/ likelihood of occurrence (5). There are discrepancies in the assessment of extreme weather, which has been rated in Hungary at 5, but in Austria at 2. Similar assessment has been made of epidemics/pandemics and cyber threats, both assessed at 5 in Hungary, but at 1 in Austria.</p>	
<u>Exposures and vulnerabilities</u>	
<p>The Austrian assessment shows that production capacities would mostly be exposed to meteorological, biological and technological risks.</p>	
<u>Potential impact</u>	
<p>On the Austrian side of the border, meteorological and technological risks would mainly impact the economy/ supply security.</p>	
<u>Governance readiness and gaps</u>	
<p>Meteorological/hydrological risks have been assessed with few discrepancies between the two border regions, with the exception of wildfires, which has been assessed the highest capability (3) in Hungary, but at a lower level (1) in Austria. Similar results can be seen by geophysical risk, epidemics/pandemics, animal/plant diseases and nuclear/radiological accidents which have all been assessed with a high capability in Hungary, but lower in Austria. Terrorism and cyber threats have not been assessed in the HU/AT border.</p>	
<u>Availability/gaps of cross-border tools/agreements</u>	
<p>From the Austrian side of the border, no agreement could be found for biological and societal risks (except migration). 1 to 2 agreements and 1-2 tools could be found for all other types of risks.</p>	
<u>Recommendations</u>	
<p>Address Discrepancies in Risk Assessment:</p> <p>Hungary and Austria should collaborate to address the identified discrepancies in risk assessment, particularly regarding extreme weather, epidemics/pandemics, and cyber threats. This collaboration could involve sharing data, conducting joint risk assessments, and aligning methodologies to ensure a more consistent understanding of risks along their border.</p>	
<p>Strengthen Governance Readiness:</p> <p>While Hungary appears to have higher capabilities to address various risks, there is room for improvement in Austria, particularly in areas such as wildfires and geophysical risks. Both countries should invest in enhancing their capabilities to address a wide range of risks, including those related to flooding, migration, extreme weather, and technological hazards.</p>	
<p>Enhance Cross-Border Cooperation:</p> <p>Hungary and Austria should continue to strengthen cross-border cooperation on various risk management issues. This could include expanding existing cooperation frameworks and agreements to cover a broader range of risks, such as wildfires and cyber threats. Joint exercises, training sessions, and information sharing initiatives can further enhance collaboration and preparedness.</p>	
<u>Data availability/quality and resulting impact on reliability of the assessment</u>	
<p>Data availability and quality is assessed as medium to low for the Austrian side of the border given that two agreements were found. The Austrian assessment is qualitative and subjective given the constraints met during data collection which included unavailability of key experts for interviews, unresearched risks (incl. their probability of happening, their impact and the exposure of society and economy) and when these have been researched, they may not be shared given their sensitivity (for example the risk of terrorism).</p>	

HUNGARY - AUSTRIA



Therefore, the assessment is based on a comprehensive body of publicly available data and information accessed through desk research or cutting-edge AI tools such as Perplexity.



LEGEND

Each side of the petal represents a different risk level, with the smallest petal indicating a low risk level (1).

When risk groups have identical values, they are depicted within the same petal, segmented by the color associated with each risk group.



Probability (P):
1 - low
5 - high

Impact (I):
1 - low
5 - high

		Probability		Impact		Capability
		Hungary	Austria	Hungary	Austria	Average
Meteorological and hydrological	extreme weather	5	2	4.67	2	2.5
	flooding	5	5	4.67	2	2.5
	drought	4	2	4	1.83	2.5
	wild fire	4	5	3.33	1.83	1.5
Geohazards	geophysical risk	2	1	1.67	1	2
Biological	epidemics/pandemics	5	1	3.33	1	1.5
	animal & plant diseases	2	1	2.83	1	2.5
Technological	nuclear & radiological accidents	1	2	2	2.33	3
	disruption of critical infrastructure	4	1	4	1.17	2.5
Societal	terrorism	2	1	1.17	1	1.5
	cyber threats	5	1	1.17	3.67	0
	migration	5	5	2.67	1	2

ORANGE: high probability (3 or higher) and low capability (1.5 or lower)
RED: high impact (3 or higher) and low capability (1.5 or lower)
DARK RED: low capability comes along with both high probability and high impact

Table 31 HUNGARY - CROATIA

HUNGARY - CROATIA	
	 
<u>Overall review of risks</u>	
<p>Biological risks are assessed as average on the border, with discrepancies across the two sides. The most relevant risks (i.e. average above 3) are: Extreme weather (4.5); Flooding (4.5); Cyber threats (4); Migration (4).</p>	
<u>Discrepancies in risk assessment</u>	
<p>Quite a few of the assessment of risk shows discrepancies, mostly with +1 or -1 in difference, however a few risks stand out, i.e. Drought and wildfires assessed in Hungary as respectively 4 and 3, and in Croatia as 2 and 1. Similar assessment has been done for epidemics/pandemics (5 in Hungary, 2 in Croatia), animal and plant diseases (4 in Hungary, 2 in Croatia), and 5 in Hungary and 3 in Croatia for both Cyber threats and migration. This shows that for Hungary most risks are assessed with a higher probability than for Croatia.</p>	
<u>Exposures and vulnerabilities</u>	
<p>In Croatia, the border region is a relatively low-risk area, however, the area is very vulnerable to extreme weather events and floods and reasonably vulnerable to cyber threats and migrations. Joining the Schengen area has shifted the pressure of illegal migration to other, external Schengen borders (Croatia-Serbia and Croatia-Bosnia and Herzegovina, Hungary-Serbia).</p>	
<u>Potential impact</u>	
<p>Both on Hungarian and on Croatian sides, floods have the largest potential as they can affect the infrastructure, households and business and thus reduce the functional capacity of the population and services. Cyber threats and migrations can on the other hand have strong potential impact on defence capability and Internal security, as well as international and EU activities.</p>	
<u>Governance readiness and gaps</u>	
<p>Overall, Hungary results to be relatively better equipped to address risks (all risks assessed at the highest of 3 with the exception of societal risks which are lacking data), while for Hungary the capability is on lower end of the scale with the exception of flooding.</p>	
<u>Availability/gaps of cross-border tools/agreements</u>	
<p>There is strong cooperation between Hungary and Croatia on water management issues (particularly important as most of the border is along a river), policing and maintenance of cross-border infrastructure (roads and bridges, pipelines, transmission lines). With regards to the other risks there are ad-hoc activities (on a bilateral basis) and good cooperation within INTERREG programmes and locally and regionally between the municipalities and between the counties.</p>	
<u>Recommendations</u>	
<p>Address Discrepancies in Risk Assessment:</p> <p>Hungary and Croatia should collaborate to address the identified discrepancies in risk assessment, particularly regarding risks such as drought, wildfires, epidemics/pandemics, animal and plant diseases, cyber threats, and migration. This collaboration could involve sharing data, conducting joint risk assessments, and aligning methodologies to ensure a more consistent understanding of risks along their border.</p>	
<p>Strengthen Governance Readiness:</p> <p>While Hungary appears to be relatively better equipped to address risks, there is room for improvement in both countries' governance readiness, especially for Croatia. Both countries should invest in enhancing their capabilities to address a wide range of risks, including those related to extreme weather events, floods, cyber threats, and migrations. This could involve improving resources, training programs, and coordination mechanisms.</p>	
<p>Enhance Cross-Border Cooperation:</p> <p>Hungary and Croatia should continue to strengthen cross-border cooperation on various risk management issues. This could include expanding existing cooperation frameworks on water management, policing, and infrastructure maintenance to cover other high-risk areas identified, such as extreme weather, wildfires, and biological risks. Leveraging INTERREG programs and local/regional cooperation networks can further enhance collaboration.</p>	

HUNGARY - CROATIA



Joint Measures for Risk Management:

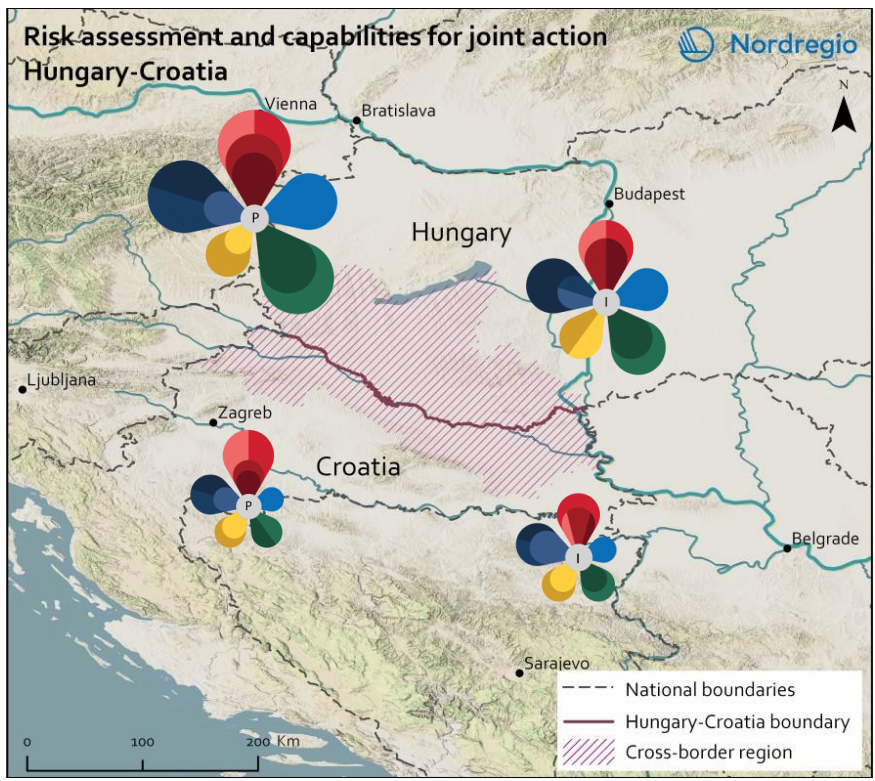
Both countries should consider implementing joint measures to strengthen the management of common risks, such as extreme weather, wildfires, and biological, technological, and societal risks. This could involve sharing best practices, exchanging expertise, conducting joint training exercises, and developing common risk management strategies tailored to the border region's specific needs.

Improve Data Availability and Quality:

Hungary and Croatia should prioritize improving data availability and quality, especially for risk assessments related to the cross-border region. This could involve enhancing data collection efforts, sharing relevant information between local, regional, and national authorities, and ensuring that risk assessments reflect the most up-to-date and accurate data available.

Data availability/quality and resulting impact on reliability of the assessment

On Croatian side, national risk assessments do not contain many details on the border region. There is strong cooperation on local level that may not be accounted for in various documents, strategies, and programmes on national level. The assessment and scoring are qualitative and subjective, as the publicly available documents might lack more detailed data on some categories of risks.



LEGEND

Each side of the petal represents a different risk level, with the smallest petal indicating a low risk level (1).

When risk groups have identical values, they are depicted within the same petal, segmented by the color associated with each risk group.

Probability (P):
1 - low
5 - high

Impact (I):
1 - low
5 - high



		Probability		Impact		Capability
		Hungary	Croatia	Hungary	Croatia	Average
Meteorological and hydrological	extreme weather	5	4	3.67	1.5	2.5
	flooding	5	4	3.67	3	3
	drought	4	2	3.33	1.83	2.5
	wild fires	3	1	3	1.5	2.5
Geohazards	geophysical risk	4	1	3.17	1	2.5
Biological	epidemics/pandemics	5	2	3.67	1.5	2.5
	animal & plant diseases	4	2	3.33	1.33	2.5
Technological	nuclear & radiological emergencies	1	1	3	1	3
	disruption of critical infrastructure	3	2	3	1.5	3
Societal	terrorism	2	1	2	1.67	2
	cyber threats	5	3	1.5	2.67	1
	migration	5	3	3.67	2.5	2

ORANGE: high probability (3 or higher) and low capability (1.5 or lower)

RED: high impact (3 or higher) and low capability (1.5 or lower)

DARK RED: low capability comes along with both high probability and high impact

Table 32 HUNGARY - ROMANIA

HUNGARY - ROMANIA	
	 
<u>Overall review of risks</u>	
<p>High risks have been assessed for flooding (4.5), drought (4.5), epidemics/pandemics (4.5), animal/plant diseases (4.5), extreme weather (3.5), and average risk for migration (3) and disruption of critical infrastructure (3). Low risk has been assessed for nuclear / radiological accidents (1) and terrorism (1).</p>	
<u>Discrepancies in risk assessment</u>	
<p>There are clear discrepancies between a few of the risks as follows: Disruption of critical infrastructure (5 Hungary, 3 Romania); 2. Cyber threats (5 Hungary, 3 Romania); 3. Migration (5 Hungary, 3 Romania); Extreme weather (5 Hungary, 2 Romania).</p>	
<u>Exposures and vulnerabilities</u>	
<p>Due to major rivers like the Tisza flowing from Romania to Hungary, exposure to infrastructure, housing, and agriculture is high. There is a high possibility of floods, posing a significant risk to the border territory. The cross-border territory is severely exposed to droughts, indicating high vulnerability as the infrastructure is not yet prepared, with damages occurring more frequently in recent years.</p> <p>Due to the flora of the region, wildfires do not pose a high threat. This border territory is affected less than average by seismic activity. Regular animal migration, particularly of wild boars, leads to the occurrence of different types of animal diseases like swine fever. The presence of the Hungarian nuclear power plant of Paks raises the exposure to the risk of nuclear accident also on the Romanian side of the border.</p>	
<u>Potential impact</u>	
<p>In Hungary, extreme weather events may impact rivers and lands. Flooding can affect rivers, while drought can impact soil and intensive agriculture. Epidemics/pandemics are potentially impactful, as seen with COVID. There is frequent transmission of animal and plant diseases. As regards nuclear and radiological accidents, the presence of the Paks nuclear power plant in Hungary raises the probability score to an average level, with potential impacts even on the Romanian side of the border.</p> <p>On the Romanian side geophysical risks may impact the infrastructure and functional capacity of the economy, while the disruption of critical infrastructure may impact the economy and security of supply. Flooding is a key risk and may have significant impact on the infrastructure and less impact on economy and security of supply and international and EU activities.</p>	
<u>Governance readiness and gaps</u>	
<p>Hungary shows a higher capability (3) to address all risks at the border. On the Romanian side of the border, the results are more varied. The highest capability on the Romanian side is assessed with regards to floods and forest fires.</p>	
<u>Availability/gaps of cross-border tools/agreements</u>	
<p>There is a sectoral bilateral agreement regarding the sustainable use of waters along the border, that includes common regulations for the management of floods and accidental pollution in the shared waters, and a bilateral agreement in the field of emergency situations. Besides, several INTERREG projects related to floods were implemented, which contributed to strengthening the governance processes at local level. Joint activities such as exercises, training sessions, and workshops are occasionally organised between the neighbouring countries. There are inspiring initiatives at local level, such as the establishment of a regional cross-border training centre for integrated preparedness for interventions in case of emergencies. This centre is located in the Bihor Hajdu-Bihar cross-border territory between Romania and Hungary. There is a regional protocol for the river Tisa. With regards to forest fires, joint intervention plans at local level were developed as part of some INTERREG projects.</p> <p>For several risks with high probability, such as drought, extreme weather, epidemics/pandemics, and animal and plant diseases, the governance framework remains underdeveloped. Hence, there is an opportunity for improvement by encouraging risk assessment, information sharing, the development of joint intervention plans and methodologies, etc.</p>	

HUNGARY - ROMANIA



Recommendations

Address Discrepancies in Risk Assessment:

Hungary and Romania should collaborate to address the identified discrepancies in risk assessment, particularly regarding the disruption of critical infrastructure, cyber threats, migration, and extreme weather. This collaboration could involve sharing data, expertise, and best practices to ensure a more aligned understanding of the most significant risks along their border.

Strengthen Governance Framework for High-Risk Areas:

While there is evidence of a well-established governance framework between Hungary and Romania for managing flood risks and forest fires, there is an opportunity to strengthen governance processes for other high-risk areas such as drought, epidemics/pandemics, and animal/plant diseases. This could include the development of joint intervention plans, information sharing mechanisms, and capacity building initiatives.

Enhance Capability to Address High-Risk Areas:

Romania should focus on enhancing its capability to address high-risk areas such as drought, epidemics/pandemics, and animal/plant diseases, where it has assessed low capability. This could involve investing in resources, training programs, and infrastructure to improve preparedness and response measures.

Improve Collaboration on Cross-Border Tools and Agreements:

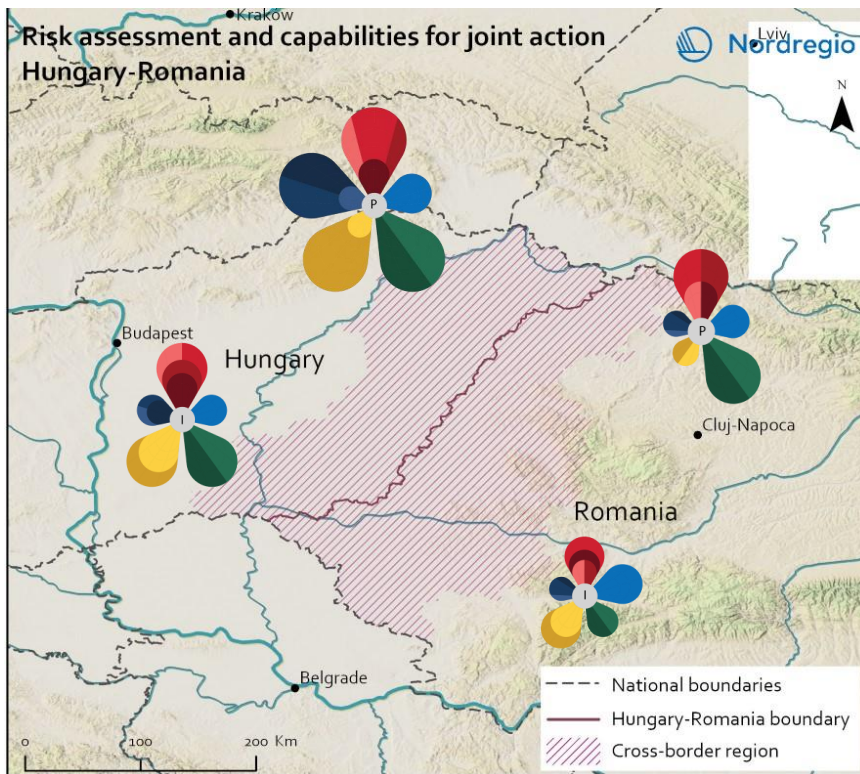
Both countries should continue to strengthen collaboration on cross-border tools and agreements, such as sectoral bilateral agreements and joint intervention plans. They should explore opportunities to expand these agreements to cover other high-risk areas identified, such as cyber threats and disruption of critical infrastructure.

Enhance Data Availability and Quality:

Both Hungary and Romania should prioritize improving data availability and quality, especially for societal risks such as cyber threats and terrorism. This could involve investing in data collection efforts, improving data-sharing mechanisms, and enhancing coordination between relevant agencies to ensure reliable risk assessments.

Data availability/quality and resulting impact on reliability of the assessment



Limited data on societal risks. Most of the data available is in relation to flooding.



		Probability		Impact		Capability
		Hungary	Romania	Hungary	Romania	Average
Meteorological and hydrological	extreme weather	5	2	4.17	1.33	2
	flooding	5	4	4.33	2.67	3
	drought	5	4	3.33	1.33	2
	wild fires	2	2	1.83	1.5	3
Geohazards	geophysical risk	3	2	2	3	2.5
Biological	epidemics/ pandemics	5	4	4.33	2.33	2
	animal & plant diseases	5	4	4.33	1.67	2
Technological	nuclear & radiological emergencies	1	1	3	2.33	3
	disruption of critical infrastructure	5	1	4.33	3	2
Societal	terrorism	1	1	2	1	2
	cyber threats	5	1	1.5	1	2
	migration	5	1	1	1	2

ORANGE: high probability (3 or higher) and low capability (1.5 or lower)
RED: high impact (3 or higher) and low capability (1.5 or lower)
DARK RED: low capability comes along with both high probability and high impact

Table 33 HUNGARY - SLOVENIA

HUNGARY - SLOVENIA	 
<p><u>Overall review of risks</u></p> <p>The most relevant risks assessed above the average 3 are: Flooding (3.5); Cyber threats (3.5); Migration (3.5); Epidemics/pandemics (3).</p> <p>The risks assessed with the lowest probability/likelihood of occurrence is nuclear/radiological accidents (1) and wildfires (1.5).</p>	
<p><u>Discrepancies in risk assessment</u></p> <p>High discrepancies between the borders are identified for the following risk assessments: Cyber threats (5 Hungary, 2 Slovenia); Migration (5 Hungary, 2 Slovenia); Geophysical risks (4 in Hungary, 1 Slovenia); 4. Epidemics/pandemics (4 Hungary, 2 Slovenia).</p>	
<p><u>Exposures and vulnerabilities</u></p> <p>On Slovenian side, the biggest vulnerabilities are the risk of floods, particularly of Mura and Ledava rivers, and drought as the area receives low amounts of precipitation. Other types of exposures in this cross-border region are considered to be low. Illegal migration has surged in recent years, hence Slovenia introduced border control between the two countries.</p>	
<p><u>Potential impact</u></p> <p>Both on Hungarian and on Slovenian sides, floods and droughts could significantly affect infrastructure as well as households and businesses, thus functional capacity of the population and services could be at risk. Threats from terrorism, cyber-attacks and the pressure of illegal migration affect the internal security as well as activities on international and EU level. In late 2023 Slovenia temporarily reintroduced border control despite both MS being in Schengen area. The reasons cited are threats to public order and internal security in the EU, the situation in the Middle East and in Ukraine, recent terrorist attacks in some Member States, increased security risks due to organised crime in the Western Balkans, including people smuggling, risk of infiltration in mixed migration flows.</p>	
<p><u>Governance readiness and gaps</u></p> <p>On the Hungarian side, governance readiness has been assessed as low. On the Slovenian side, governance readiness has been assessed as high for almost all risks; the cross-border territory has low vulnerability and low potential impact for most hazards compared to other regions in Slovenia.</p>	
<p><u>Availability/gaps of cross-border tools/agreements</u></p> <p>Cooperation is well established and there are bilateral agreements on water management issues, early exchange of information in the event of radiological emergency and on the cooperation in combating terrorism, illicit traffic of drugs and organised crime. With regards to the other risks, there are ad-hoc activities and good cooperation at local level between the municipalities on both sides of the border and between the municipalities and counties.</p>	
<p><u>Recommendations</u></p> <p>Address Discrepancies in Risk Assessment:</p> <p>Given the identified discrepancies in risk assessment, particularly regarding cyber threats, migration, and geophysical risks, Hungary and Slovenia should collaborate to align their risk assessments and develop a shared understanding of the most significant risks along their border. This can facilitate more effective cross-border cooperation and response planning.</p> <p>Strengthen Cooperation on Flood Management:</p> <p>Both countries should prioritize joint measures to strengthen the management of flooding, considering its significant impact on infrastructure and communities along the border. This could involve sharing best practices, coordinating flood prevention efforts, and establishing mechanisms for early warning and rapid response to flood events.</p> <p>Enhance Preparedness for Cyber Threats:</p> <p>Given the increasing threat of cyber-attacks, Hungary and Slovenia should focus on enhancing their cybersecurity capabilities and cooperation. This may include joint cybersecurity exercises, information sharing mechanisms, and collaboration on cybersecurity policies and strategies to mitigate the risk of cyber incidents along the border.</p>	

HUNGARY - SLOVENIA



Improve Governance Readiness:

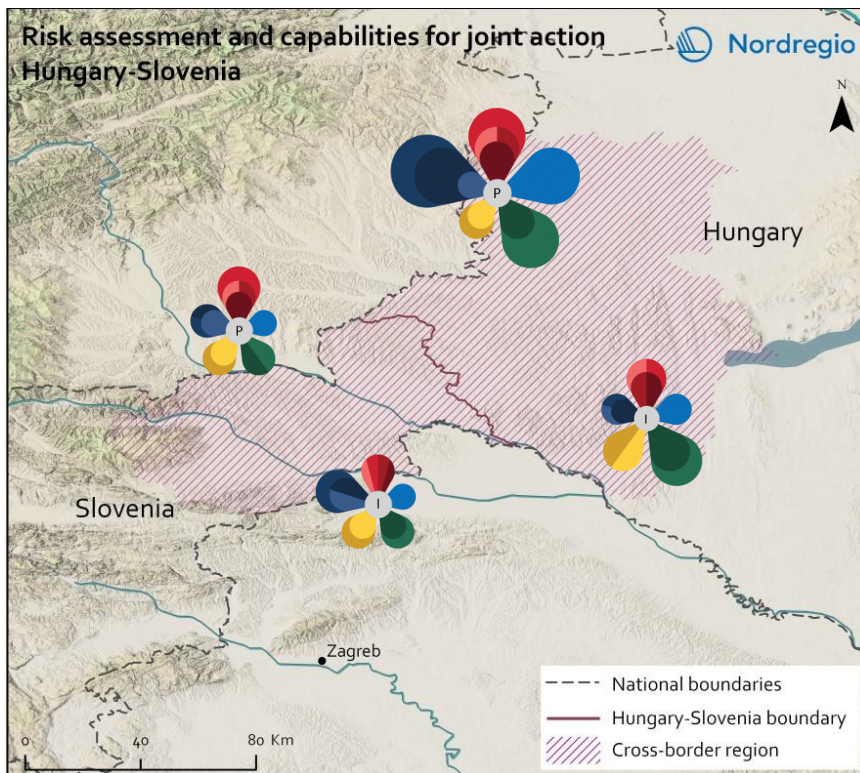
Hungary should address the assessed low governance readiness by enhancing its institutional capacity and preparedness measures for various hazards. Slovenia, while assessed as having high governance readiness, can support Hungary in strengthening its governance structures and emergency response capabilities through knowledge sharing and capacity building initiatives.

Promote Institutionalized Cross-Border Cooperation:

Both countries should explore opportunities for institutionalized cross-border cooperation at the regional level, involving border counties, municipalities, and national authorities. This could facilitate more structured collaboration on risk management, emergency response planning, and joint initiatives to address common challenges along the border.

Data availability/quality and resulting impact on reliability of the assessment

On Slovenian side, the data sources from national risk assessments and hydrometeorological observations are reliable. However, there is little data available on cooperation activities and mechanisms. There is long-term cooperation between the border municipalities in Slovenia and border municipalities and counties in Hungary, but it was so far focused on culture and heritage. Nevertheless, it is likely that there is some cooperation, at least informally, especially among the voluntary firefighting brigades. There are also several examples for bilateral cooperation on joint programmes between the central governments, but rather on an ad-hoc format. The assessment and scoring are qualitative and subjective, as the publicly available documents might lack more detailed data on some categories of risks.



LEGEND

Each side of the petal represents a different risk level, with the smallest petal indicating a low risk level (1).

When risk groups have identical values, they are depicted within the same petal, segmented by the color associated with each risk group.



Probability (P):
1 - low
5 - high

Impact (I):
1 - low
5 - high



		Probability		Impact		Capability
		Hungary	Slovenia	Hungary	Slovenia	Average
Meteorological and hydrological	extreme weather	3	2	2.5	1.5	2.5
	flooding	4	3	3	1.67	3
	drought	3	2	2.33	1.83	2.5
	wild fire	2	1	2.33	1.5	2.5
Geohazards	geophysical risk	4	1	1.5	1	2.5
Biological	epidemics/pandemics	4	2	4	1.5-	2.5
	animal & plant diseases	2	2	3	1.33	2.5
Technological	nuclear & radiological accidents	1	1	3	1	3
	disruption of critical infrastructure	2	2	3	1.5	2.5
Societal	terrorism	1	1	2	1.67	2
	cyber threats	5	2	1.5	2.67	1
	migration	4	2	1	1.5	2

ORANGE: high probability (3 or higher) and low capability (1.5 or lower)

RED: high impact (3 or higher) and low capability (1.5 or lower)

DARK RED: low capability comes along with both high probability and high impact

Table 34 IRELAND - UK

IRELAND - UK  
<p><u>Overall review of risks</u></p> <p>Terrorism was assessed with the highest probability/likelihood (5), followed by extreme weather, flooding, epidemics/pandemics, animal/plant diseases, and disruption of critical infrastructure (each assessed as 4). The lowest risks are wildfires (1), geophysical risks (1), nuclear/radiological accidents (2), and migration (2).</p>
<p><u>Discrepancies in risk assessment</u></p> <p>No discrepancies have been identified.</p>
<p><u>Exposures and vulnerabilities</u></p> <p>Exposures and vulnerabilities are high for extreme weather and flooding for housing, production capacities and infrastructure. It is also extremely high for geophysical hazards. They are high for the agricultural sector as long as animal and plant diseases and epidemics and pandemics are concerned (production capacity in general). There is also high vulnerability and exposure to nuclear and radiological accidents as well as for production capacities and infrastructure as long as cyber threats are concerned.</p>
<p><u>Potential impact</u></p> <p>The impact would be the highest in the case of terrorism because of the recent history of the region. It is followed by extreme weather, flooding and epidemics/pandemics. Impacts would be higher on critical infrastructure in case of flooding and on production capacities in case of cyber threats and terrorism.</p>
<p><u>Governance readiness and gaps</u></p> <p>Governance readiness for most risks is identified as at a medium level, except for nuclear and radiological accidents and cyber threats, which have the lowest scores indicating gaps in readiness.</p>
<p><u>Availability/gaps of cross-border tools/agreements</u></p> <p>There are eight entries in the inventory of tools out of which two institutions and two working groups. Moreover, there is a portal, a platform, and an action plan.</p> <p>In terms of agreements, there is the Balleyconnel Agreement which is multi-risk and Waterways Ireland which is specifically relevant to flooding.</p>
<p><u>Recommendations</u></p> <p>High Priority on Terrorism Preparedness:</p> <p>Given the highest probability of terrorism, both Ireland and the UK should maintain a high level of readiness and cooperation in countering terrorist threats. Joint initiatives, information sharing, and coordinated response efforts should be prioritized to enhance security along the border and protect communities from potential terrorist incidents.</p> <p>Strengthen Resilience to Extreme Weather and Flooding:</p> <p>With extreme weather and flooding posing significant risks to housing, infrastructure, and production capacities, both countries should focus on strengthening resilience measures. This may include investing in flood defences, improving early warning systems, and implementing land use planning strategies to mitigate the impacts of extreme weather events.</p> <p>Enhance Collaboration on Animal and Plant Diseases:</p> <p>Given the high vulnerability of the agricultural sector to animal and plant diseases, Ireland and the UK should enhance collaboration in disease surveillance, control measures, and response planning. Joint efforts can help prevent the spread of diseases, protect livestock and crops, and minimize economic losses in the agricultural sector.</p> <p>Improve Cybersecurity Measures:</p> <p>Considering the high vulnerability to cyber threats and their potential impact on critical infrastructure and production capacities, both countries should prioritize cybersecurity measures. This may involve sharing best practices, conducting joint cybersecurity exercises, and enhancing capabilities to detect, prevent, and respond to cyber-attacks effectively.</p> <p>Address Governance Gaps and Enhance Cross-Border Cooperation:</p> <p>While both countries demonstrate medium readiness in addressing most risks, there are identified gaps in addressing nuclear and radiological accidents and cyber threats. It is essential to address these gaps by</p>

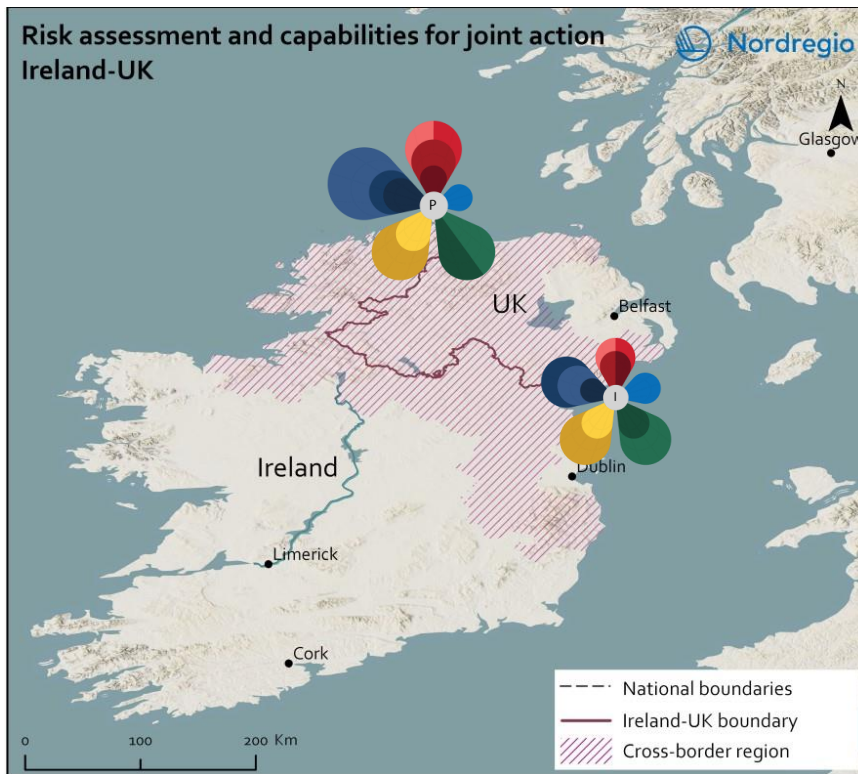
IRELAND - UK



strengthening governance structures, enhancing coordination mechanisms, and fostering cross-border cooperation through joint initiatives, agreements, and working groups.

Data availability/quality and resulting impact on reliability of the assessment

The National Risk Assessment of Ireland has been the main source of information. This information has been complemented by interviews and emergency plan review.



LEGEND

Each side of the petal represents a different risk level, with the smallest petal indicating a low risk level (1).

When risk groups have identical values, they are depicted within the same petal, segmented by the color associated with each risk group.



Probability (P):
1 - low
5 - high



Impact (I):
1 - low
5 - high

		Probability		Impact		Capability
		Ireland	UK	Ireland	UK	Average
Meteorological and hydrological	extreme weather	4	4	3	3	2
	flooding	4	4	2.83	2.83	3
	drought	3	3	2	2	2
	wild fires	1	1	2	2	2
Geohazards	geophysical risk	1	1	2	2	2
Biological	epidemics / pandemics	4	4	3.83	3.83	3
	animal & plant diseases	4	4	2.17	2.17	1
Technological	nuclear & radiological emergencies	2	2	2	2	0
	disruption of critical infrastructure	4	4	3.67	3.67	2
Societal	terrorism	5	5	3.33	3.33	3
	cyber threats	3	3	4	4	0
	migration	2	2	1	1	2

ORANGE: high probability (3 or higher) and low capability (1.5 or lower)
RED: high impact (3 or higher) and low capability (1.5 or lower)
DARK RED: low capability comes along with both high probability and high impact

As the risk assessment for the IRL/UK border has been conducted only for the Ireland side of the border, the map has been drawn assuming that the scores are the same on both sides of the border.

Table 35 ITALY - AUSTRIA

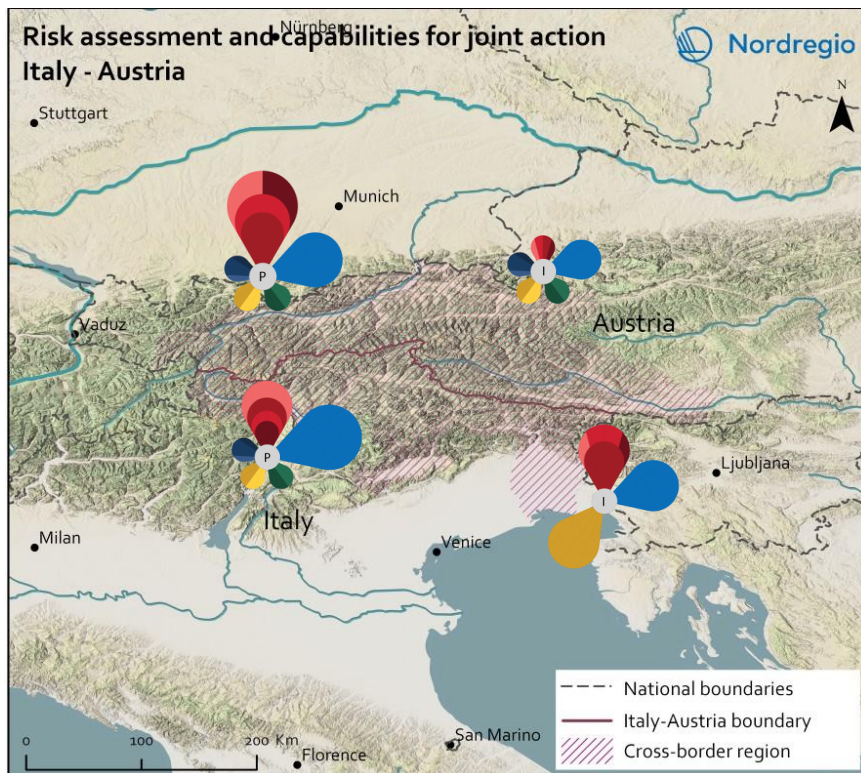
ITALY - AUSTRIA	 
<p><u>Overall review of risks</u></p> <p>Extreme weather, and geophysical risks were assessed with a very high probability/likelihood (4.5), followed by flooding, drought, wildfires, and disruption of critical infrastructure (each assessed as of average probability to occur). The lowest risks are epidemics/pandemics; animal and plant diseases; technological; and nuclear and radiological accidents.</p>	
<p><u>Discrepancies in risk assessment</u></p> <p>There are discrepancies in the assessment of hazards, mainly due to subjectivity in the evaluation conducted by the experts (due to the lack of publicly available data) and/or by the interviewees. An important discrepancy can be found for wildfires, assessed at a risk 1 in Austria, but 5 in Italy. Similar results can be found for disruption of critical infrastructure with the same numbers. This is followed by a discrepancy in the assessment of flooding, assessed as 2 in Austria and 4 in Italy. For both sides of the border drought is assessed at average probability (3).</p>	
<p><u>Exposures and vulnerabilities</u></p> <p>The Austrian assessment shows that infrastructure would mostly be exposed to geophysical risks, while housing and production capacities would be exposed to extreme weather and droughts. For the Italian side, the presence of urban areas and infrastructures near the border makes this area exposed and vulnerable to hazards including wildfires, geophysical risks, and flooding.</p>	
<p><u>Potential impact</u></p> <p>On the Austrian side of the border, geophysical risks would mainly impact the economy/ supply security, infrastructure, and the functional capacity of the population. On the Italian side, given the systemic nature of most of the risks considered, most sectors of society could be impacted at the border, especially in the case of extreme weather event and geophysical risks.</p>	
<p><u>Governance readiness and gaps</u></p> <p>The governance of DRM at the border between Italy and Austria seems to be well-developed, also considering the number of existing bilateral agreements and joint initiatives. For instance, bilateral agreements dealing with civil protection risks/emergency operations exist, as well as one addressing migration and terrorism and one on cyber threats.</p>	
<p><u>Availability/gaps of cross-border tools/agreements</u></p> <p>Italy and Austria seem to have a good level of cross-border cooperation. The number of bilateral agreements, joint projects and initiatives show good cooperation on DRM topics, specifically regarding geophysical risks, where different tools, initiatives and projects are implemented for the prevention and preparedness phases.</p>	
<p><u>Recommendations</u></p> <p>Harmonize Risk Assessments and Data Sharing:</p> <p>Work towards harmonizing risk assessments between Italy and Austria to address discrepancies in hazard evaluations. Establish mechanisms for sharing data and information on hazards, vulnerabilities, and impacts to ensure a more accurate and comprehensive understanding of cross-border risks.</p> <p>Enhance Cooperation on Wildfire and Flood Management:</p> <p>Strengthen collaboration between Italy and Austria in wildfire and flood management, considering the high likelihood of these hazards and their potential impacts on both sides of the border. This could involve joint projects, sharing of best practices, and coordinated response efforts to mitigate risks and enhance resilience.</p> <p>Develop Trilateral Projects with Slovenia:</p> <p>Explore opportunities for trilateral projects between Austria, Italy, and Slovenia, particularly in areas such as seismic risk management. Building upon successful initiatives and leveraging expertise from all three countries can enhance disaster preparedness and response capabilities in the region.</p> <p>Promote Cross-Border Training and Capacity Building:</p> <p>Facilitate cross-border training exercises and capacity-building initiatives to strengthen disaster resilience and response capabilities. This could include joint training programs, workshops, and knowledge-sharing activities aimed at enhancing the skills and expertise of stakeholders involved in disaster management.</p>	

ITALY - AUSTRIA



Data availability/quality and resulting impact on reliability of the assessment



Data availability and quality is assessed as medium for the Austrian side of the border given that six agreements were found. Data on the likelihood of risks to happen was found for about half of all risks on the Austrian side of the border. All the scores included for the Italian side are qualitative and subjective – seven of them are based on expert interviews –, as the NRA does not include a specific quantitative assessment on this border and/or does not assess specific risks, such as biological risks and societal risks – data on societal risks, such as terrorism, are sensitive data and are not publicly available. At the same time, the other documents consulted provide information not fully in line with the methodology used in this study. Hence, when possible, the authors evaluated the scores based on publicly available data and information.

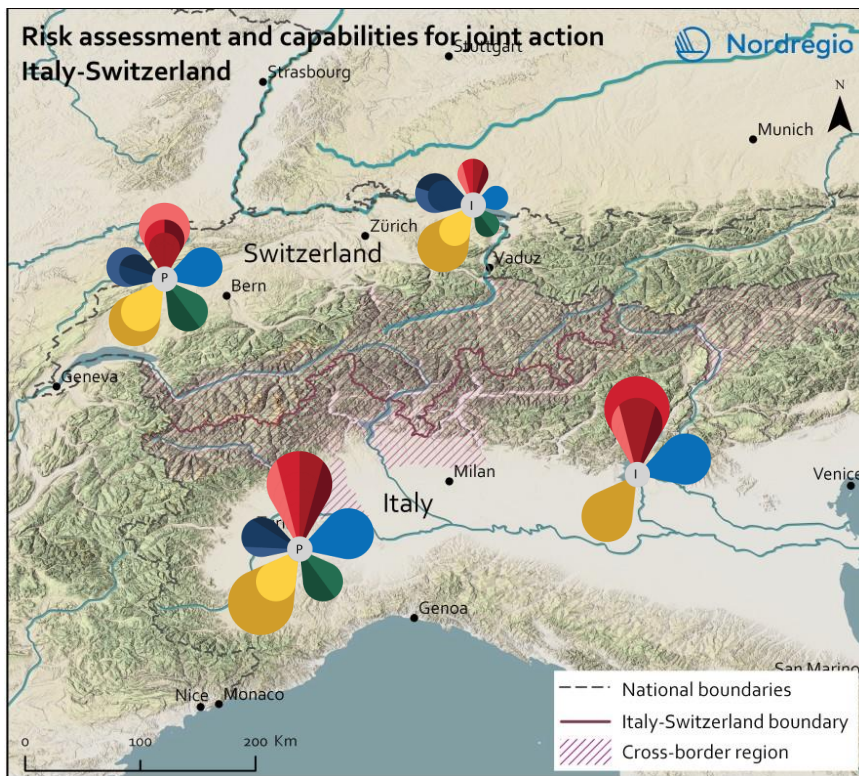


		Probability		Impact		Capability
		Italy	Austria	Italy	Austria	Average
Meteorological and hydrological	extreme weather	4	5	4	1	2
	flooding	2	4	3.67	1	2
	draught	3	3	3	1	3
	wild fires	1	5	4	1	2
Geohazards	geophysical risk	5	4	3.67	2.5	2
Biological	epidemics / pandemics	1	1	-	1	1
	animal & plant diseases	1	1	-	1	1
Technological	nuclear & radiological accidents	1	1	-	1	1
	disruption of critical infrastructure	1	1	4	1	1
Societal	terrorism	1	1	-	1	1
	cyber threats	1	1	-	1	2
	migration	1	1	-	1	2

ORANGE: high probability (3 or higher) and low capability (1.5 or lower)
RED: high impact (3 or higher) and low capability (1.5 or lower)
DARK RED: low capability comes along with both high probability and high impact

Table 36 ITALY - SWITZERLAND

ITALY - SWITZERLAND	 
<u>Overall review of risks</u>	
<p>Extreme weather and disruption of critical infrastructure were assessed with a very high probability/likelihood (4.5), followed by flooding and wildfires (each assessed as of high probability to occur). The lowest risks are cyber threats and mass population displacements in emergencies (2.5).</p>	
<u>Discrepancies in risk assessment</u>	
<p>There are discrepancies in the assessment (especially for flooding, drought, and wildfires), mainly due to subjectivity in the evaluation, which was necessary due to the lack of publicly available data and/or specific information at the border. Both countries have assessed extreme weather and geophysical risks as having an average or above-average probability of occurring, with only a small difference between them.</p>	
<u>Exposures and vulnerabilities</u>	
<p>Based on authors' assessment, housing, production capacity and infrastructure are sectors most exposed to hydrometeorological hazards. Particularly vulnerable due to high urbanisation is the area of the border close to the lakes. The infrastructure sector is also exposed to geophysical risk and flooding, seeing the existence of motorway tunnels and dams.</p>	
<u>Potential impact</u>	
<p>On both sides of the border the most impacted sectors from meteo-hydrological hazards and geohazards are identified in the economy and security, infrastructure, and functional capacity of the population. Lower impact is identified from biological hazards, and in general on international and EU activities, internal security and defence capability areas.</p>	
<u>Governance readiness and gaps</u>	
<p>The governance of DRM at the border between Italy and Switzerland seems to be well-developed, also considering the number of existing bilateral agreements and joint initiatives.</p>	
<u>Availability/gaps of cross-border tools/agreements</u>	
<p>Italy and Switzerland seem to have a good level of cross-border cooperation. The number of bilateral agreements and initiatives show a good cooperation on DRM topics, especially on nuclear and radiological accidents, and multi-risks.</p>	
<u>Recommendations</u>	
<p>Enhance Cross-Border Collaboration on Risk Management:</p> <p>Strengthen cooperation between Italy and Switzerland to address the identified hazards, particularly focusing on meteorological, hydrological, and geophysical risks. This could involve joint projects, information sharing, and capacity-building initiatives to improve disaster resilience in the cross-border region.</p>	
<p>Focus on Prevention and Preparedness Measures:</p> <p>Invest in prevention and preparedness measures to mitigate the potential impacts of hazards along the border. This may include early warning systems, infrastructure improvements, land use planning, and community education programmes to enhance resilience and reduce vulnerability.</p>	
<u>Data availability/quality and resulting impact on reliability of the assessment</u>	
<p>All the scores included for the Italian side are qualitative and subjective, as the NRA does not include a specific quantitative assessment on this border and/or does not assess specific risks, such as societal risks – data on societal risks, such as terrorism, are sensitive data and are not publicly available. At the same time, the other documents consulted provide information not fully in line with the methodology used in this study. Hence, when possible, the authors evaluated the scores on the basis of publicly available data and information. Similarly, for Switzerland, most hazards are assessed in the NRA at national level, and data is not available for quantitative assessment of the border regions. In particular, critical infrastructure data and potential impacts is classified information for the country of Switzerland.</p>	



		Probability		Impact		Capability
		Italy	Switzerland	Italy	Switzerland	Average
Meteorological and hydrological	extreme weather	5	4	4.33	2	2.5
	flooding	5	3	5	2.17	3
	drought	5	2	4	2	2.5
	wild fires	5	3	4	2	2.5
Geohazards	geophysical risk	4	3	4	0.67	2.5
Biological	epidemics / pandemics	3	3	-	1.33	0
	animal & plant diseases	3	3	-	1.17	0
Technological	nuclear & radiological emergencies	3	3	-	2	2.5
	disruption of critical infrastructure	5	4	4	4	0
Societal	terrorism	3	3	-	3	0
	cyber threats	3	2	-	2	0
	migration	3	2	-	3	0

ORANGE: high probability (3 or higher) and low capability (1.5 or lower)
RED: high impact (3 or higher) and low capability (1.5 or lower)
DARK RED: low capability comes along with both high probability and high impact

Table 37 ITALY – CROATIA

ITALY – CROATIA



Overall review of risks

The probability of extreme weather is assessed as above average on both sides. Disruption of critical infrastructures is assessed on average/below average on both sides. Geophysical hazards are evaluated on average for the Italian side and low in the Croatian side. Societal hazards – except for migration – are evaluated below average.

Discrepancies in risk assessment

There are discrepancies in the assessment of hazards, mainly due to subjectivity in the evaluation conducted by the experts (due to the lack of publicly available data and the type of border considered – maritime border).

Exposures and vulnerabilities

For the Italian side, the presence of urban areas and infrastructures alongside the coast makes this area exposed and vulnerable to some of the hazards considered. It is similar in Croatia, with high vulnerability of tourist infrastructure and tourism sector as a whole.

Potential impact

Given the systemic nature of most risks on the Italian side, most sectors of society along the coast have the potential to be impacted. The same applies to Croatia.

Governance readiness and gaps

The governance of DRM at the maritime border between Italy and Croatia is considered to be well developed, taking into account the number of existing agreements and joint initiatives. The Treaty of Osimo, signed by Italy and Yugoslavia in 1975 and succeeded by Croatia, provides a historic cooperation framework. It includes collaboration in water management, road and water links, protection of the Adriatic against pollution, and port cooperation. This Treaty was successfully used as a platform for current cooperation and agreements.

Availability/gaps of cross-border tools/agreements

Considering the maritime border, Italy and Croatia are considered to have a sufficient level of cross-border cooperation. The existing agreements and joint projects/initiatives show a good collaboration on DRM. A number of tools and projects are implemented, especially on multi-risks.

Recommendations

Enhance Cross-Border Cooperation on Risk Management:

While there is already a good level of cross-border cooperation between Italy and Croatia, particularly in addressing hazards relevant to the maritime border, there is room for further enhancement. Both countries should explore opportunities to strengthen cooperation through joint projects focused on the cross-border management of extreme weather events and geophysical risks. This can include sharing best practices, resources, and expertise to improve disaster resilience in the region.

Utilize Existing Governance Structures:

Leverage existing governance structures and agreements, such as the Treaty of Osimo, to facilitate ongoing collaboration and coordination on disaster risk management. These frameworks provide a historic foundation for cooperation and can serve as valuable platforms for addressing shared risks along the maritime border.

Implement Multi-Risk Approaches:

Adopt multi-risk approaches to disaster risk management that consider the interconnected nature of hazards and their potential impacts on both sides of the border. Develop joint strategies and action plans that address a range of hazards, including extreme weather events, disruption of critical infrastructure, and geophysical risks, to enhance overall resilience in the region.

Promote Information Sharing and Public Awareness:

Foster information sharing and public awareness campaigns to ensure that communities on both sides of the border are informed about the risks they face and are prepared to respond effectively. By raising awareness about disaster preparedness and response measures, individuals and communities can take proactive steps to mitigate risks and protect themselves in the event of emergencies.

Continuously Monitor and Evaluate:

Establish mechanisms for continuous monitoring and evaluation of cross-border risk management efforts. Regularly assess the effectiveness of collaborative initiatives and identify areas for improvement or further

ITALY – CROATIA





action. By adopting a proactive and adaptive approach to risk management, Italy and Croatia can better anticipate and respond to evolving hazards and challenges along the maritime border.

Data availability/quality and resulting impact on reliability of the assessment

All the scores included for the Italian side are qualitative and subjective, as the NRA does not include a specific quantitative assessment on this border and/or does not assess specific risks, such as societal risks – data on societal risks, such as terrorism, are sensitive data and are not publicly available. At the same time, the other documents consulted provide information not fully in line with the methodology used in this study. Hence, when possible, the authors evaluated the scores based on publicly available data and information. The same applies to Croatia.

Table 38 ITALY – MONTENEGRO

ITALY – MONTENEGRO	 
<u>Overall review of risks</u>	
Extreme weather is considered a highly likely hazard. Geophysical risks are also considered as above average to occur.	
<u>Discrepancies in risk assessment</u>	
There are a few discrepancies in the assessment, mainly due to subjectivity in the evaluation, which was necessary due to the lack of publicly available data and/or specific information related to this cross-border territory.	
<u>Exposures and vulnerabilities</u>	
The Montenegrin assessment shows that coastal infrastructure and housing, tourism as well as natural/marine environment would be affected by extreme weather occurrences and/or floods and, forest fires and droughts. For the Italian side, the presence of urban areas and infrastructures alongside the coast makes this area exposed and vulnerable to some of the hazards considered.	
<u>Potential impact</u>	
Geophysical/extreme weather risks would mainly impact the Montenegrin economy and supply security, infrastructure and the functional capacity of the population at the coastal area. In addition, migration can pose to a certain extent a risk to security and economy of the Montenegrin. On the Italian side, given the systemic nature of most of the risks considered, most sectors of society could be impacted along the coast.	
<u>Governance readiness and gaps</u>	
The governance of DRM at the maritime border between Italy and Montenegro is mainly based on multi-lateral agreements and conventions, rather than bilateral agreements.	
<u>Availability/gaps of cross-border tools/agreements</u>	
New topic-specific agreements are needed due to the maritime border delineation resulting from the fall of Yugoslavia, with remaining Republics, now independent countries, inheriting former Yugoslavia acts and agreements. These agreements should align with new climate change data, addressing extreme weather conditions, wildfires, floods, biological-chemical risks, and terrorism. Despite a limited level of cross-border cooperation between Italy and Montenegro regarding maritime borders, existing agreements and joint projects/initiatives demonstrate a good relationship on disaster risk management (DRM) topics.	
<u>Recommendations</u>	
Develop Topic-Specific Bilateral Agreements:	
Recognize the need for new, topic-specific bilateral agreements between Italy and Montenegro that address climate change data, extreme weather conditions, wildfires, floods, and biological-chemical risks. These agreements should be tailored to the maritime border region and should outline coordinated strategies for disaster risk management and response.	
Implement Cross-Border Projects on Risk Management:	
Prioritize the implementation of joint projects focused on cross-border risk management, particularly addressing extreme weather and geophysical risks. Collaborative initiatives can include joint training exercises, resource sharing, and the development of common risk management strategies to enhance preparedness and resilience along the maritime border.	
Establish a Cross-Border Cooperation Panel or Committee:	
Create a dedicated panel or committee focused on climate risk mitigation and disaster management for the maritime border region. This entity can facilitate ongoing communication, coordination, and collaboration between Italy and Montenegro, ensuring a proactive approach to addressing shared risks.	
Utilize Existing Collaboration Mechanisms:	
Leverage existing collaboration mechanisms, such as IPA programmes on Disaster Risk Management, to support joint initiatives between Italy and Montenegro. These programmes can provide funding and technical assistance for cross-border projects focused on disaster preparedness, response, and recovery.	
Enhance Data Sharing and Public Awareness:	
Improve data availability and quality, especially on the Montenegrin side, to support evidence-based decision-making and risk assessment. Additionally, raise public awareness about the risks posed by extreme weather	

ITALY – MONTENEGRO



and geophysical hazards in the maritime border region. Engage local communities in disaster preparedness activities and promote information sharing on DRM best practices and lessons learned.

Data availability/quality and resulting impact on reliability of the assessment

Data availability and quality is assessed as low-medium for the Montenegro side of the border given that three bilateral agreements were found. Data availability is a challenge from Montenegro side, especially in the form that can be assessed, used or analysed and is publicly available. All the scores included for the Italian side are qualitative and subjective, as the NRA does not include a specific quantitative assessment on this border and/or does not assess specific risks, such as societal risks – data on societal risks, such as terrorism, are sensitive data and are not publicly available. At the same time, the other documents consulted provide information not fully in line with the methodology used in this study. Hence, when possible, the authors evaluated the scores on the basis of publicly available data and information.

Table 39 LITHUANIA – POLAND

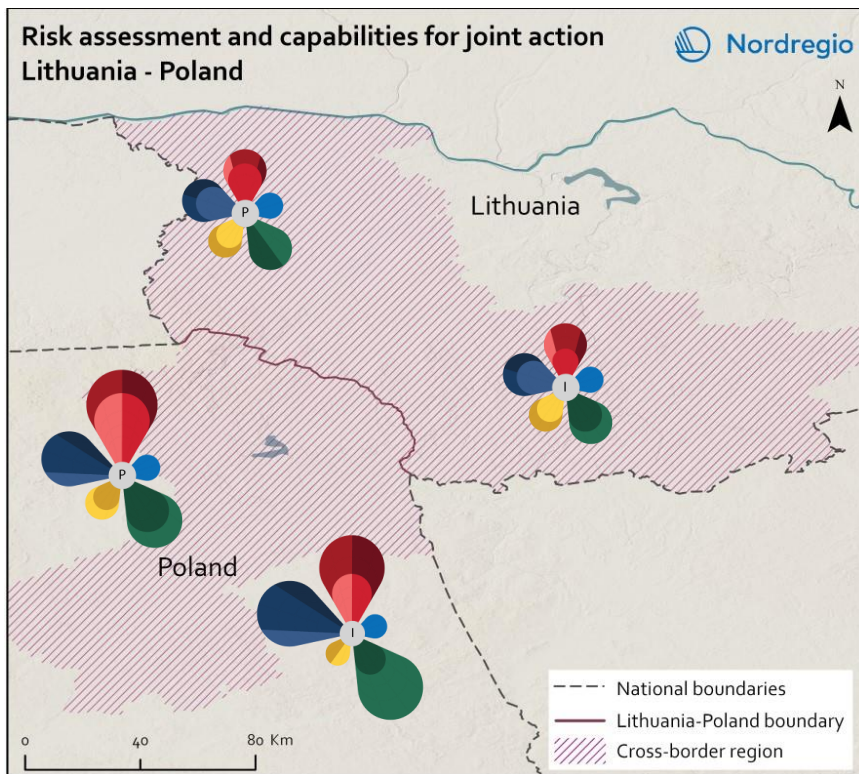
LITHUANIA – POLAND	
<u>Overall review of risks</u>	Six risks have been assessed with probability above 3.5, namely: Drought (4); Wildfires (4); Extreme weather (3.5); Epidemics/pandemics (3.5); Cyber threats (3.5); Migration (3.5).
<u>Discrepancies in risk assessment</u>	Most of the risks are assessed as similar in probability and likelihood. There are some discrepancies between the two borders for some risks, especially for flooding, drought, wildfires, and terrorism where Poland has assessed the risks higher than Lithuania.
<u>Exposures and vulnerabilities</u>	From the Lithuanian perspective, the border region faces risks related to extreme weather activities (caused by the proximity of the Baltic Sea), wildfires and animal and plant diseases – all related to the wooded areas along the border. Epidemics are recognised to be a greater vulnerability for border communities, while migration, cyber threats and terrorism are linked to potential flows from the Belarusian border.
<u>Potential impact</u>	Both on the Lithuanian and Polish border regions, the population density along the cross-border region is low, with larger urban centres being further into the country. The impacts for flora and fauna would be greater as the border is wooded.
<u>Governance readiness and gaps</u>	There is a multi-risk agreement between Republic of Lithuania and the Government of the Republic of Poland on cooperation and mutual assistance in the event of disasters, natural disasters, and other special events. It can be considered a general agreement for cooperation in the event of disaster. Specific actions are slowly being taken: in the 2021-2027 INTERREG programme wildfires, extreme weather, draughts, and flooding are recognised. This will hopefully foster more cooperative initiatives in DRM along the border. Within the framework of INTERREG, opportunities were provided to enhance the capabilities of fire brigades in responding to challenges posed by the COVID-19 pandemic or any other outbreak of infectious disease by fostering long-term partnerships and cooperation between firefighting and rescue services.
<u>Availability/gaps of cross-border tools/agreements</u>	Although cyber threats and terrorism are taken seriously both in terms of risk and potential impact, this is limited to the Lithuanian-Belarusian border. The Polish-Lithuanian border is considered a potential risk area, particularly if breaches occur in more vulnerable neighbouring borders, although the primary focus is on the eastern border.
<u>Recommendations</u>	<p>Enhance Cross-Border Cooperation on Disaster Response and Management:</p> <p>Strengthen the existing multi-risk agreement between Lithuania and Poland by developing specific action plans and protocols for joint disaster response and management. Focus on sharing resources, expertise, and best practices to effectively address risks such as wildfires, extreme weather events, droughts, and epidemics/pandemics.</p> <p>Improve Information Sharing and Coordination for Border Security:</p> <p>Recognize the evolving geopolitical situation in the region and the potential security threats along the border. Enhance information sharing mechanisms and coordination efforts between Lithuania and Poland to address emerging risks related to migration, cyber threats, and terrorism. Foster collaboration between law enforcement agencies, intelligence services, and relevant stakeholders to mitigate security challenges effectively.</p> <p>Enhance Data Sharing and Analysis for Informed Decision-Making:</p> <p>Improve data availability, quality, and sharing mechanisms to support evidence-based risk assessment and decision-making processes. Invest in cross-border research initiatives, data-sharing platforms, and collaborative projects to enhance the reliability and accuracy of risk assessments. Foster partnerships between national agencies, research institutions, and international organizations to strengthen the resilience of border regions against various hazards.</p>

LITHUANIA – POLAND



Data availability/quality and resulting impact on reliability of the assessment

Conducted interviews from the Lithuanian perspective point towards low availability of cross-border agreements. This may stem both from the relatively low impacts from hazards along the borders and reliance on international organisations to present guidelines, coordinate approaches, etc. For Poland, the availability and quality of the data were sufficient. The analysis primarily relies on the National Risk Assessments, the IT Country Protection System's preliminary flood risk assessment (GIS visualization) in the border region, and relevant bilateral agreements. Additionally, further insights into the future prospects of cross-border cooperation are derived from the most recent formal statements of both governments.



LEGEND

Each side of the petal represents a different risk level, with the smallest petal indicating a low risk level (1).

When risk groups have identical values, they are depicted within the same petal, segmented by the color associated with each risk group.



Probability (P):
1 - low
5 - high

Impact (I):
1 - low
5 - high

		Probability		Impact		Capability
		Lithuania	Poland	Lithuania	Poland	Average
Meteorological and hydrological	extreme weather	3	4	2.67	3.17	1
	flooding	2	4	1	3	1
	drought	3	5	2.67	5	1
	wild fire	3	5	2.67	5	1
Geohazards	geophysical risk	1	1	1	1	1
Biological	epidemics/pandemics	3	4	2.83	5	1
	animal & plant diseases	3	3	1.67	2.17	1
Technological	nuclear & radiological emergencies	1	2	1	1	1
	disruption of critical infrastructure	2	1	1.83	1	1
Societal	terrorism	2	4	2.33	5	1
	cyber threats	3	4	3	5	1
	migration	3	4	2.5	4.5	1

ORANGE: high probability (3 or higher) and low capability (1.5 or lower)
RED: high impact (3 or higher) and low capability (1.5 or lower)
DARK RED: low capability comes along with both high probability and high impact

Table 40 LUXEMBURG – GERMANY

LUXEMBURG – GERMANY	
	 
<u>Overall review of risks</u>	
The hazards that have been rated as more likely than average overall are flooding and cyber-threats.	
<u>Discrepancies in risk assessment</u>	
Several hazards are assessed differently on the two sides of the border. The most significant discrepancies emerge in the following risk assessments: Extreme weather and drought (2 in Luxembourg, 4 in Germany); Disruption of critical infrastructure (1 in Luxembourg, 3 in Germany); Terrorism (2 in Luxembourg, 4 in Germany); Cyber-threats (3 in Luxembourg, 5 in Germany).	
<u>Exposures and vulnerabilities</u>	
Luxembourg considers itself particularly vulnerable to nuclear and radiological risks (from the French nuclear plants) and to epidemics and pandemics, and somewhat vulnerable to flooding and cyber threats.	
<u>Potential impact</u>	
Impacts caused by nuclear and radiological accidents, and disruption of critical infrastructure are assessed as high on the German side of the border. Cyber threats and terrorism are assessed as average. On the Luxembourgish side of the border the impacts from flooding, and nuclear accidents are assessed as high, followed by cyber threats that are assessed as above average.	
<u>Governance readiness and gaps</u>	
There are significant governance gaps across all the hazards, except for flooding and nuclear and radiological incidents (the highest impact risks on the Luxembourgish side).	
<u>Availability/gaps of cross-border tools/agreements</u>	
Agreements predominantly cover flooding as well as nuclear and radiological incidents. They are lacking for other risk, except for a general agreement on post-crisis emergency services cooperation.	
<u>Recommendations</u>	
Enhance Collaboration on Extreme Weather and Drought Management:	
Recognize the significant differences in risk assessment for extreme weather and drought between Luxembourg and Germany. Establish joint initiatives for early warning systems, drought monitoring, and heatwave response protocols. Exchange best practices and coordinate efforts to improve resilience to climate-related hazards in the border region.	
Strengthen Cooperation in Critical Infrastructure Protection:	
Address the disparities in risk assessment for the disruption of critical infrastructure. Develop cross-border frameworks for critical infrastructure protection, including cybersecurity measures, infrastructure resilience planning, and coordinated response strategies. Foster information sharing and joint training exercises to enhance preparedness for potential threats.	
Improve Collaboration on Counter-Terrorism Efforts:	
Acknowledge the differences in risk perception regarding terrorism and cyber-threats. Establish bilateral mechanisms for intelligence sharing, joint threat assessments, and coordinated response planning. Enhance cooperation between law enforcement agencies, intelligence services, and other relevant stakeholders to mitigate the risk of terrorist activities in the cross-border territory.	
Expand Cross-Border Agreements Beyond Flooding and Nuclear Risks:	
While existing agreements cover flooding and nuclear incidents, recognize the need for broader cooperation on other risks. Work towards developing comprehensive cross-border agreements or protocols for managing epidemics, cyber-threats, terrorism, and other relevant hazards. Engage in multilateral discussions and explore opportunities for regional collaboration to address shared challenges effectively.	
Invest in Data Sharing and Quality Improvement:	
Address the data availability and quality issues identified, particularly on the Luxembourgish side. Invest in improving data collection, monitoring, and analysis capabilities for a wide range of hazards. Foster collaboration between national agencies, research institutions, and international partners to enhance data	

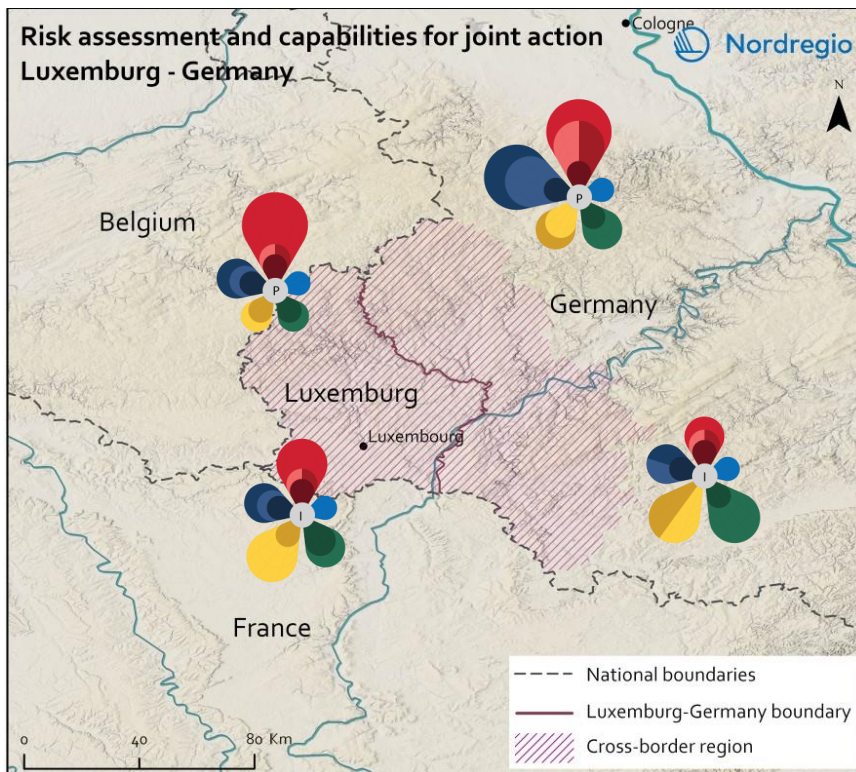
LUXEMBURG – GERMANY



sharing, standardization, and reliability. Prioritize the development of region-specific risk assessments to inform evidence-based decision-making and policy development.

Data availability/quality and resulting impact on reliability of the assessment

The Luxembourgish data quality was insufficient for most risks except terrorism, flooding, and nuclear and radiological incidents. For Germany, the availability and quality of data on natural disasters are high. The analysis is mainly based on the national risk assessments of the responsible authorities, which are partly based on GIS visualization. Risk analyses on animal and plant diseases were of high quality and are regularly updated. Concerning man-made disasters (nuclear accidents, the disruption of critical infrastructure, terrorism, cyber-attacks) and epidemics/pandemics, it was only possible to draw on national analyses that were not region-specific.



LEGEND

Each side of the petal represents a different risk level, with the smallest petal indicating a low risk level (1).

When risk groups have identical values, they are depicted within the same petal, segmented by the color associated with each risk group.





Probability (P):
 1 - low
 5 - high

Impact (I):
 1 - low
 5 - high

		Probability		Impact		Capability
		Luxemburg	Germany	Luxemburg	Germany	Average
Meteorological and hydrological	extreme weather	2	4	2	2.33	1.5
	flooding	5	5	4	2.67	3
	drought	2	4	2	2	0
	wild fire	1	1	1	1	1
Geohazards	geophysical risk	1	1	1	1	0
Biological	epidemics/pandemics	2	3	2.83	3.67	0
	animal & plant diseases	1	1	1.83	1	0
Technological	nuclear & radiological accidents	2	2	4	4	1
	disruption of critical infrastructure	1	3	1	4	0
Societal	terrorism	2	4	2	3	0.5
	cyber threats	3	5	3	3	0.5
	migration	1	1	1	1	0

ORANGE: high probability (3 or higher) and low capability (1.5 or lower)
RED: high impact (3 or higher) and low capability (1.5 or lower)
DARK RED: low capability comes along with both high probability and high impact

Table 41 LATVIA - LITHUANIA

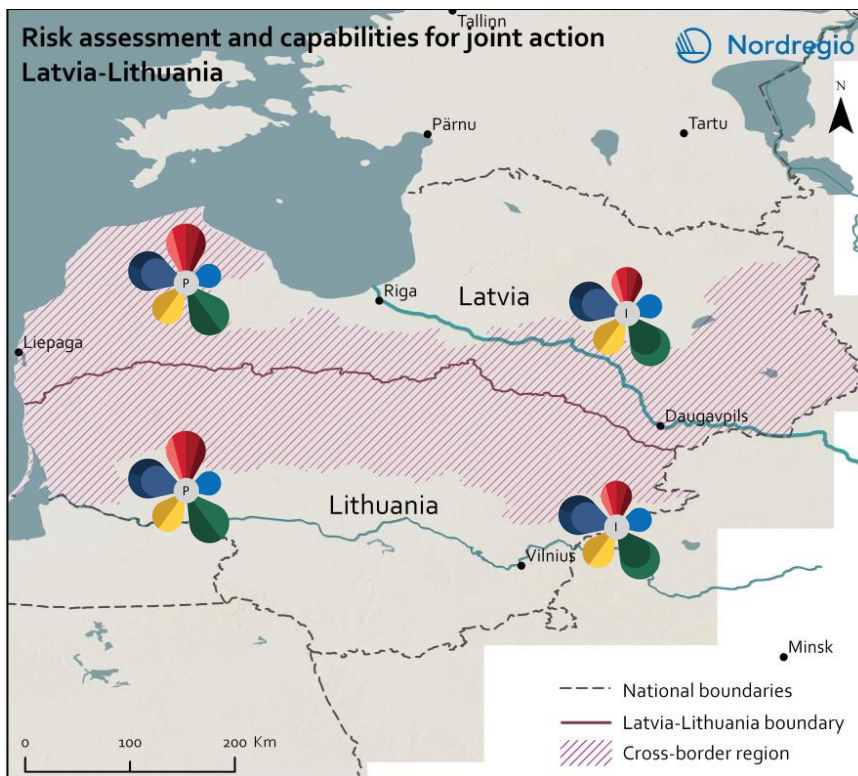
LATVIA - LITHUANIA	 
<p><u>Overall review of risks</u></p> <p>The most relevant risks, all assessed as average, are the following: meteorological and hydrological risks, biological risks, cyber threats, and mass migration. All the others are assessed as below average.</p>	
<p><u>Discrepancies in risk assessment</u></p> <p>The risks are assessed the same on both sides of the border.</p>	
<p><u>Exposures and vulnerabilities</u></p> <p>Exposure to meteorological risks comes from the proximity to the Baltic Sea and extreme weather caused by storms. Migrant crisis has been taken seriously recognising the impact it can have not only on the countries but also on other EU countries if Lithuania and/or Latvia is treated as a transit country for migrants or a point of vulnerability in cyber-attacks.</p>	
<p><u>Potential impact</u></p> <p>Urban centres on the eastern part of the cross-border region can be impacted by wildfires. Animal and plant disease risks could impact farms operating in the region and the threat of invasive species to the local forests.</p>	
<p><u>Governance readiness and gaps</u></p> <p>The governance capability has been assessed as low or average (1 or 2, respectively) throughout all typologies of hazard.</p>	
<p><u>Availability/gaps of cross-border tools/agreements</u></p> <p>Lithuania has an agreement with Latvia and Estonia on mutual assistance and cooperation in the field of disaster prevention, preparedness and response. Furthermore, the current INTERREG VI-A-Latvia-Lithuania Programme sees greater recognition of border risks, but it is has not deployed concrete tools.</p>	
<p><u>Recommendations:</u></p> <p>Enhance Preparedness for Epidemics and Biological Risks:</p> <p>Despite the low probability assessment, prioritize enhancing preparedness for epidemics and biological risks. Develop joint contingency plans, stockpile essential medical supplies, and establish communication channels for rapid information exchange during public health emergencies. Invest in training healthcare professionals and conducting public awareness campaigns to mitigate the impact of potential outbreaks.</p> <p>Strengthen Cooperation on Meteorological and Hydrological Risks:</p> <p>Recognize the potential impact of extreme weather events and flooding, particularly in urban centres near the Baltic Sea. Collaborate on early warning systems, flood management strategies, and infrastructure resilience projects. Exchange best practices and data to improve forecasting accuracy and response coordination during weather-related emergencies.</p> <p>Address Cyber Threats Through Joint Initiatives:</p> <p>Acknowledge the shared vulnerability to cyber threats and the potential consequences for critical infrastructure and digital systems. Establish bilateral mechanisms for information sharing, incident response coordination, and capacity-building in cybersecurity. Foster collaboration between law enforcement agencies, cybersecurity experts, and private sector stakeholders to strengthen cyber resilience.</p> <p>Develop Cross-Border Cooperation Mechanisms for Migration Management:</p> <p>Recognize the importance of effective migration management to address potential challenges stemming from migrant crises. Establish joint task forces or working groups to coordinate border security efforts, share intelligence on migration patterns, and facilitate humanitarian assistance for vulnerable populations. Enhance cooperation with international organizations and neighbouring countries to develop comprehensive migration policies and response strategies.</p> <p>Utilize INTERREG and EU Programs for Risk Mitigation:</p> <p>Take advantage of INTERREG and other EU programs to support cross-border risk mitigation initiatives. Apply for funding to implement joint projects focused on disaster preparedness, environmental protection, and border security. Leverage existing networks and partnerships to access resources, expertise, and best practices for enhancing resilience and addressing shared risks effectively.</p>	

LATVIA - LITHUANIA



Data availability/quality and resulting impact on reliability of the assessment

Conducted interviews from the Lithuanian perspective point towards low availability of cross-border agreements. This may stem both from the relatively low impacts from hazards along the borders and reliance on international organisations to present guidelines, coordinate approaches, etc.



LEGEND

Each side of the petal represents a different risk level, with the smallest petal indicating a low risk level (1).

When risk groups have identical values, they are depicted within the same petal, segmented by the color associated with each risk group.

Probability (P):
1 - low
5 - high

Impact (I):
1 - low
5 - high



	Probability		Impact		Capability	
	Lithuania	Latvia	Lithuania	Latvia	Average	
Meteorological and hydrological	extreme weather	3	3	1.5	1.5	1
	flooding	3	3	1.5	1.5	1
	drought	3	3	1.67	1.67	1
	wild fire	3	3	1.67	1.67	1
Geohazards	geophysical risk	1	1	1	1	1
Biological	epidemics/pandemics	3	3	2.83	2.83	1
	animal & plant diseases	3	3	1.67	1.67	1
Technological	nuclear & radiological emergencies	2	2	2	2	1
	disruption of critical infrastructure	2	2	1.83	1.83	1
Societal	terrorism	2	2	2.33	2.33	1
	cyber threats	3	3	3	3	1
	migration	3	3	2.5	2.5	1

ORANGE: high probability (3 or higher) and low capability (1.5 or lower)

RED: high impact (3 or higher) and low capability (1.5 or lower)

DARK RED: low capability comes along with both high probability and high impact

Table 42 MALTA - ITALY

MALTA - ITALY	 
<p><u>Overall review of risks</u></p> <p>The probability of extreme weather and geophysical hazards is assessed as above average. Hazards of disruption of critical infrastructure and migration are evaluated with medium probability. Scores for hazards such as flooding, drought, wildfire, biological, technological, and societal hazards are evaluated low due to the type of border (maritime).</p>	
<p><u>Discrepancies in risk assessment</u></p> <p>Despite occasional lack of available information, there is generally an agreement on the assessment of risks at the border according to the authors' judgment.</p>	
<p><u>Exposures and vulnerabilities</u></p> <p>Housing and infrastructure sectors such as ports are most exposed to extreme weather and geophysical risks. Production capacities' exposure is evaluated as medium for most risks. In the case of Malta, its reliance on desalination plants and import of drinkable water from Italy makes it particularly vulnerable to geophysical risk and disruption of critical infrastructure.</p>	
<p><u>Potential impact</u></p> <p>Geophysical risk is evaluated as having the highest potential impact on infrastructure and the functional capacity of the population and services.</p>	
<p><u>Governance readiness and gaps</u></p> <p>The joint governance appears sufficiently articulated with regards to extreme weather events and geophysical risks, in terms of response cooperation and exchange of forecasting and early warning data. Also, as reported in interviews, the cooperation between the civil protection of Malta and Sicily is robust.</p>	
<p><u>Availability/gaps of cross-border tools/agreements</u></p> <p>The agreements in place are few (two single border and one multi-border). However, there are several initiatives of collaboration such as INTERREG and UCPM projects between the two countries which encompass all phases of the DRM cycle, especially on multi-risks and geophysical risks.</p>	
<p><u>Recommendations</u></p> <p>Strengthen Cooperation on Specific Hazards:</p> <p>While the governance system is well-articulated for extreme weather and geophysical risks, there is room for further cooperation. Focus on enhancing joint efforts and exchange of information, particularly in areas where vulnerabilities and exposures are identified, such as extreme weather events and geophysical risks.</p> <p>Utilize Existing Tools and Initiatives:</p> <p>Leverage existing tools and initiatives, such as INTERREG and UCPM projects, to enhance disaster risk management (DRM) capabilities. Build upon the results achieved in previous projects focused on multi-risks, extreme weather, flooding, pandemics, and geophysical risks. Continue investing in prevention and preparedness measures to boost disaster resilience.</p> <p>Enhance Cross-Border Agreements:</p> <p>Strengthen cross-border agreements and initiatives to address gaps in DRM along the maritime border between Malta and Italy. Explore opportunities for bilateral or multilateral agreements that facilitate cooperation in disaster response, early warning systems, and information sharing. Ensure that these agreements encompass all phases of the DRM cycle and address specific hazards identified in the assessment.</p> <p>Improve Data Availability and Quality:</p> <p>Address limitations in data availability and quality covering maritime borders. Invest in data collection, monitoring, and analysis to provide more quantitative assessments of risks and vulnerabilities. Enhance coordination between relevant agencies and stakeholders to ensure reliable and up-to-date information for risk assessment and decision-making.</p> <p>Promote Capacity Building and Training:</p> <p>Invest in capacity building and training programs for stakeholders involved in DRM, including civil protection agencies, emergency responders, and local communities. Provide training on disaster preparedness,</p>	

MALTA - ITALY



response, and recovery measures tailored to address specific hazards and vulnerabilities identified in the assessment.

Encourage Public Awareness and Education:

Raise public awareness and education on disaster risks and preparedness measures, particularly among communities living in vulnerable areas along the maritime border. Implement outreach programs, public campaigns, and educational initiatives to empower individuals and communities to take proactive steps to mitigate risks and enhance resilience.

Data availability/quality and resulting impact on reliability of the assessment

Data availability covering the maritime borders are limited in both countries. Due to this, the risk scores are qualitative and subjective, as the NRAs do not include specific quantitative assessments on this border and the other documents consulted provide information not fully in line with the methodology used in this study. The authors evaluated the scores on the basis of publicly available data and information.

Table 43 NETHERLANDS - GERMANY

NETHERLANDS - GERMANY	
<u>Overall review of risks</u>	The hazards that have been rated as more likely than average are: Drought, Wildfires, Epidemics/Pandemics, Animal and plant disease, Disruption of critical infrastructure and Cyber threats.
<u>Discrepancies in risk assessment</u>	There are very limited discrepancies in the assessment of probability of the different hazards. The only significant ones are Geophysical hazards (scored as 1 in the Netherlands and 3 in Germany, respectively) and epidemics/pandemics (scored as 5 in the Netherlands and 3 in Germany).
<u>Exposures and vulnerabilities</u>	The highest exposure risk is seen in relation to extreme weather and wildfire events, with housing and infrastructure being rated as particularly vulnerable. Discrepancies exist with regard to technological and biological disasters.
<u>Potential impact</u>	Both countries see the highest risks in the disruption of critical infrastructure (4 out of 5 points), terrorism and cyber-attacks (both 3 out of 5). Differences are seen in wildfires (Germany: 3, Netherlands: 2) and epidemics/pandemics (Germany: 2.67, Netherlands: 3.67).
<u>Governance readiness and gaps</u>	The assessment of governance readiness is the same across the two sides of the border. Significant capability gaps emerge in the governance of Droughts, Geophysical risks, Animal and plant disease, Nuclear and radiological accidents, Disruption of critical infrastructure, Cyber threats, Migration.
<u>Availability/gaps of cross-border tools/agreements</u>	There are neither treaties nor initiatives in the area of geological and technological disasters, animal and plant diseases, drought events and mass resettlement in emergencies. In the case of cyber threats, there is only the multilateral Convention on Cybercrime.
<u>Recommendations</u>	<p>Address Discrepancies in Risk Assessment:</p> <p>Acknowledge the discrepancies in risk assessment, particularly regarding geophysical hazards and epidemics/pandemics. Establish mechanisms for harmonizing risk assessment methodologies and sharing data to ensure consistency and accuracy in evaluating cross-border risks.</p> <p>Enhance Management of High-Risk Hazards:</p> <p>Prioritize measures to strengthen the management of high-risk hazards, including drought, animal and plant diseases, disruption of critical infrastructure, cyber threats, and geophysical risks. Develop joint risk management strategies, contingency plans, and response protocols to improve resilience and preparedness in the face of these threats.</p> <p>Improve Governance Readiness and Capacities:</p> <p>Address significant capability gaps in governance readiness for various hazards, including droughts, geophysical risks, animal and plant diseases, nuclear and radiological accidents, disruption of critical infrastructure, cyber threats, and migration. Invest in capacity-building initiatives, training programs, and resource allocation to enhance the capabilities of relevant authorities and stakeholders on both sides of the border.</p> <p>Enhance Cross-Border Collaboration and Agreements:</p> <p>Establish bilateral or multilateral agreements and initiatives to address gaps in cross-border cooperation for geological and technological disasters, animal and plant diseases, drought events, and mass resettlement in emergencies. Foster collaboration between relevant agencies, institutions, and stakeholders to facilitate information sharing, joint exercises, and coordinated response efforts in the event of emergencies or disasters.</p> <p>Utilize Existing Frameworks and Initiatives:</p> <p>Leverage existing frameworks and initiatives, such as the multilateral Convention on Cybercrime, to enhance cooperation and coordination on cyber threats. Explore opportunities for joint projects, research initiatives,</p>

NETHERLANDS - GERMANY



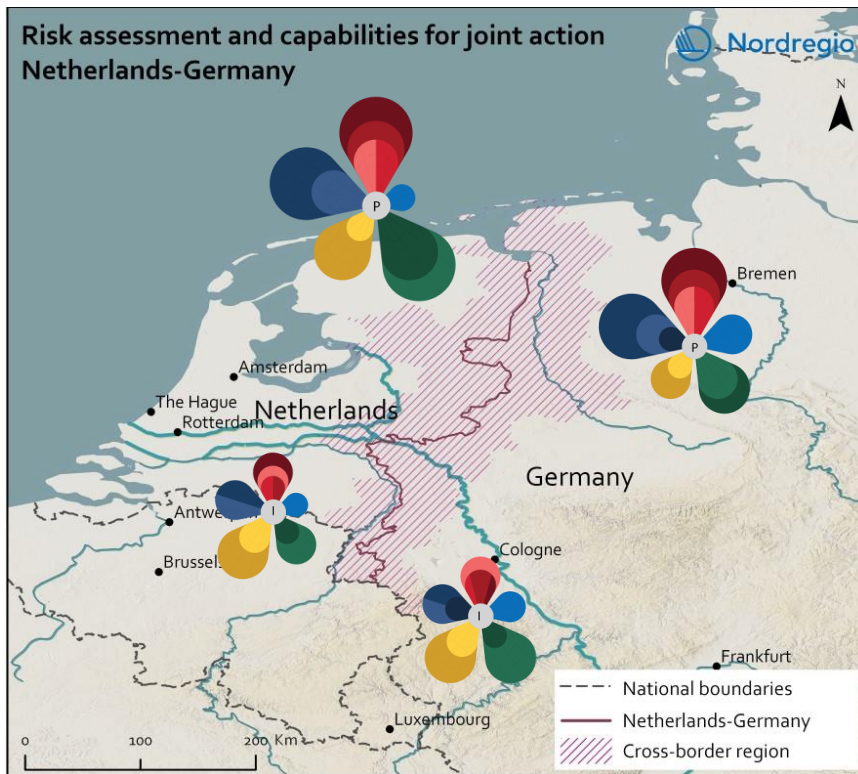
and capacity-building activities under existing regional or international cooperation mechanisms to address common challenges effectively.

Improve Data Availability and Quality:

Invest in improving data availability and quality for risk assessment, particularly for man-made disasters such as nuclear accidents, disruption of critical infrastructure, terrorism, cyber-attacks, and epidemics/pandemics. Enhance data collection, monitoring, and analysis capabilities to ensure reliable and up-to-date information for informed decision-making and risk management.

Data availability/quality and resulting impact on reliability of the assessment

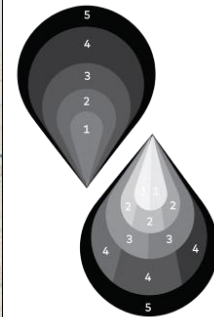
For Germany, the availability and quality of data on natural disasters is high. The analysis is mainly based on the national risk assessments of the responsible authorities, which are also partly based on GIS visualisation. Risk analyses on animal and plant diseases were of high quality and are regularly updated. Regarding man-made disasters such as nuclear accidents, the disruption of critical infrastructure, terrorism and cyber-attacks, as well as epidemics/pandemics, it was only possible to draw on national analyses that were not region-specific.



LEGEND

Each side of the petal represents a different risk level, with the smallest petal indicating a low risk level (1).

When risk groups have identical values, they are depicted within the same petal, segmented by the color associated with each risk group.



Probability (P):
1 - low
5 - high

Impact (I):
1 - low
5 - high

		Probability		Impact		Capability
		Netherlands	Germany	Netherlands	Germany	Average
Meteorological and hydrological	extreme weather	3	3	2.33	2.67	3
	flooding	3	3	1	2.17	3
	drought	4	4	1.33	2	0
	wild fires	5	5	3	2	3
Geohazards	geophysical risk	1	3	1	1.67	0
Biological	epidemics / pandemics	5	3	2.67	3.67	2
	animal & plant diseases	4	4	1.33	1.33	0
Technological	nuclear & radiological accidents	1	1	1.83	2	0
	disruption of critical infrastructure	4	3	4	4	0
Societal	terrorism	3	3	3	3	3
	cyber threats	5	5	3	3	1
	migration	-	1	-	1	0

ORANGE: high probability (3 or higher) and low capability (1.5 or lower)
RED: high impact (3 or higher) and low capability (1.5 or lower)
DARK RED: low capability comes along with both high probability and high impact

Table 44 POLAND - CZECH REPUBLIC

POLAND - CZECH REPUBLIC	
<u>Overall review of risks</u>	Six of twelve risks have been assessed as probability/likelihood average or higher. The most relevant risks (i.e. average above 3,5) are: Epidemics/pandemics (4); Disruption of critical infrastructure (3.5).
<u>Discrepancies in risk assessment</u>	There are clear discrepancies between the two sides of the border. Most noticeable is the risks assessed for extreme weather, flooding, epidemics/pandemics, and migration where in Poland the risk is assessed at the highest level (5), while in Czechia it has been assessed at lowest (1). Similar data is noticeable for other risks such as wildfires, geophysical risk, terrorism, and cyber threats. Given the mountain chain dividing both countries, it is difficult to estimate whether flooding as well other identified risks affect equally both countries or if they are only largely affecting polish territory.
<u>Exposures and vulnerabilities</u>	The polish National Risk Assessment has identified the cross-border region between Poland and the Czech Republic as having a high risk of flooding. The risk is mostly caused by seasonal floods.
<u>Potential impact</u>	The cross-border region is heavily industrialised (mining), with significant pressure on water resources. Given the vulnerability of the local population to flood risk as well as production capacities, the impact in most cases should be evaluated as relatively high to average.
<u>Governance readiness and gaps</u>	Numerous international and national agreements have been signed between both countries, providing good basis for joint governance readiness. However, the close collaboration between both countries has been marred in recent years by the dispute on the Turow mine ² , which has had a negative impact on joint efforts.
<u>Availability/gaps of cross-border tools/agreements</u>	Numerous international and national agreements have been signed between both countries in the field of water management, the monitoring of the Oder River, early notification of nuclear accidents, and the strengthening of fuel networks. Furthermore, collaboration between both countries in the field of joint risk management was reinforced as one of the focal points within the INTERREG V-A programme between Czechia and Poland from 2014 to 2021.
<u>Recommendations</u>	<p>Address Discrepancies in Risk Assessment:</p> <p>Recognize and address the clear discrepancies in risk assessment between Poland and the Czech Republic, especially regarding extreme weather, flooding, epidemics/pandemics, migration, wildfires, geophysical risks, terrorism, and cyber threats. Establish mechanisms for joint risk assessment exercises, data sharing, and collaborative research to ensure a comprehensive understanding of cross-border risks.</p> <p>Enhance Collaboration on Flood Risk Management:</p> <p>Given the high risk of flooding identified in the border region, prioritize collaboration between Poland and the Czech Republic to enhance flood risk management strategies. Develop joint floodplain management plans, early warning systems, and infrastructure resilience measures to mitigate the impact of seasonal floods on local populations and production capacities.</p> <p>Address Political Crises Impacting Cooperation:</p> <p>Recognize the impact of recent political crises, such as the dispute over the Turow mine, on formal institutional cooperation among border organizations. Dedicate efforts to rebuild mutual trust and enhance the resilience of cross-border cooperation mechanisms to prevent the creation of barriers that impede joint risk management initiatives and collaboration under programmes like INTERREG.</p>

² The key points of disagreement is the impact of the mine located in Poland on the environment, particularly on water resources in Czechia. The mine's operations have been accused of depleting groundwater levels, affecting local communities and the surrounding ecosystems. In 2021, a conflict between two nations reached the European Court of Justice, leading to hostilities. The dispute concluded in February 2022 with the signing of an agreement on the future of the Turow coalmine and compensation for the Czechs.

POLAND - CZECH REPUBLIC



Strengthen Governance Readiness and Institutional Cooperation:

Strengthen governance readiness and institutional cooperation between Poland and the Czech Republic by reinforcing existing international and national agreements in the field of water management, nuclear accident notification, and fuel networks. Prioritize joint risk management initiatives and cross-border projects to address shared risks and enhance disaster resilience in the cross-border region.

Improve Data Availability and Quality:

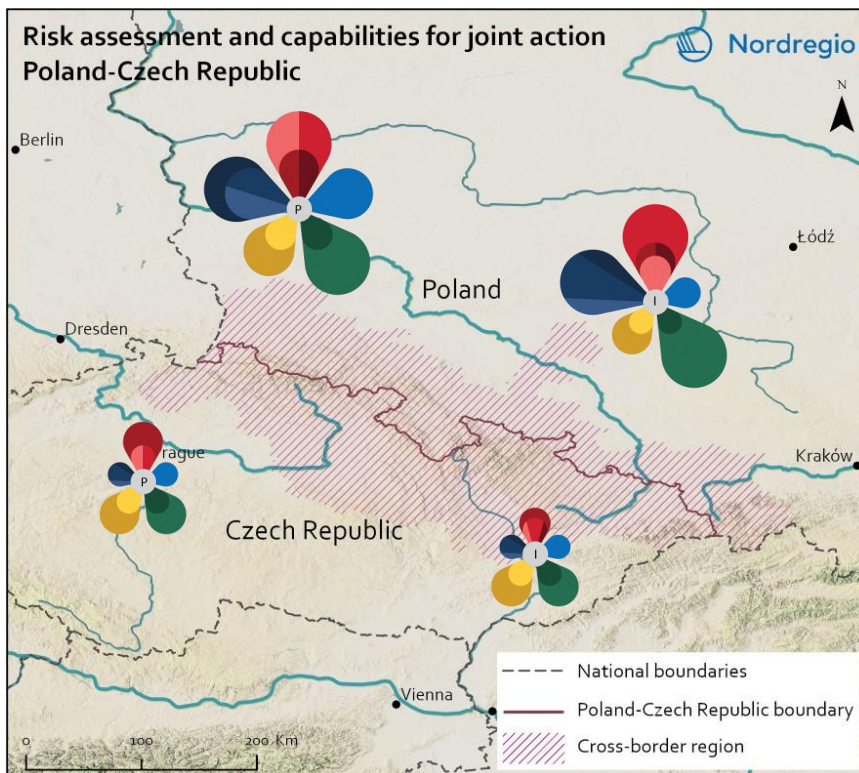
Invest in improving the availability and quality of data for risk assessment, particularly regarding cross-border risks such as flooding and environmental impacts of industrial activities like mining. Establish mechanisms for ongoing data sharing, monitoring, and updates to ensure the reliability and accuracy of risk assessments used for decision-making.

Promote Continuous Collaboration and Information Exchange:

Promote continuous collaboration and information exchange between relevant stakeholders, including government agencies, research institutions, and local communities. Foster a culture of transparency, communication, and cooperation to address emerging risks and challenges in the cross-border region effectively.

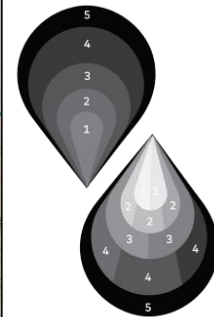
Data availability/quality and resulting impact on reliability of the assessment

For Poland, the availability and quality of the data was sufficient. The analysis draws mainly from the National risk assessments, the IT Country Protection System on preliminary flood risk assessment (GIS visualisation) of the border region, and on relevant bilateral agreements. It complements existing data with the most recent updates from the Turow disputes, as well as academic discussions around the subject and its impacts on existing collaboration.



LEGEND
 Each side of the petal represents a different risk level, with the smallest petal indicating a low risk level (1).

When risk groups have identical values, they are depicted within the same petal, segmented by the color associated with each risk group.




Probability (P):
 1 - low
 5 - high

Impact (I):
 1 - low
 5 - high

		Probability		Impact		Capability
		Poland	Czech Republic	Poland	Czech Republic	Average
Meteorological and hydrological	extreme weather	5	1	2.33	1	1
	flooding	5	1	4.5	1	2
	drought	3	3	3.17	1.5	1.5
	wild fires	3	-	2.5	1	1
Geohazards	geophysical risk	4	1	2.33	1	1
Biological	epidemics / pandemics	5	3	5	3.17	1.5
	animal & plant diseases	2	1	1.33	1	0.5
Technological	nuclear & radiological emergencies	2	1	1.33	1	2
	disruption of critical infrastructure	4	3	3	2.5	2
Societal	terrorism	4	1	5	1	1
	cyber threats	4	1	5	1	1
	migration	5	1	5	1	1.5

ORANGE: high probability (3 or higher) and low capability (1.5 or lower)
RED: high impact (3 or higher) and low capability (1.5 or lower)
DARK RED: low capability comes along with both high probability and high impact

Table 45 POLAND – SLOVAKIA

POLAND - SLOVAKIA	
	
<u>Overall review of risks</u>	
<p>Flooding (3.5), epidemics/pandemics (3.5), animal / plant diseases (3), cyber threats (4), and migration (4.5) are considered average and above average on the probability/ likelihood of risks. Wildfires and geophysical risks are considered with lowest risk.</p>	
<u>Discrepancies in risk assessment</u>	
<p>Risk assessed somewhat equal, although there are some high discrepancies between the two sides of the border for: extreme weather (Poland: 4, Slovakia: 1); flooding (Poland: 5, Slovakia: 2); terrorism (Poland: 4, Slovakia: 1).</p>	
<u>Exposures and vulnerabilities</u>	
<p>Given that the border between Poland and Slovakia consists of a zone of relatively low-populated mountain chains, in general, the exposure and vulnerability to most threats are relatively low. However, on the Polish side of the border, the high probability of flooding (seasonal floods related to melting snow) may result in a higher exposure/vulnerability of the population and local production. In Poland there is also a marked exposure to cyberthreats, as and terrorist attacks. Furthermore, given the high probability of migration crisis since the past few years, the exposure and vulnerability especially of housing and production is very high, while the infrastructure is not so highly concerned.</p> <p>The assessment from the Slovak side shows that exposure and vulnerability connected with floods and extreme weather is assessed as low (because of the natural border barrier High Tatras and not any significant river flows from SK to PL). The animal and plant diseases can expose the forestry and food sector. Cyber threats may expose the infrastructure.</p>	
<u>Potential impact</u>	
<p>The cross-border region is not densely populated, which reduces the potential impact of risks on population and the economy. In particular, the assessment of the impact of flooding risk on both sides of the border is difficult to estimate, as the border runs through a mountain chain that divides water masses.</p> <p>The animal and plant diseases have a huge impact on forestry (Ips typographus invasion in High Tatras) and food production (swine, bird flu). Migration can impact the border security and criminality in the cross-border territory.</p>	
<u>Governance readiness and gaps</u>	
<p>Numerous international and national agreements have been signed between both countries, providing good basis for governance readiness. However, further attention could be paid to risks coming from plant and animal diseases.</p> <p>The SK and PL governance are part of the Visegrad 4 group which focuses on the risk management and preparedness in cross-border regions.</p>	
<u>Availability/gaps of cross-border tools/agreements</u>	
<p>The existing landscape of agreements between the two countries reveals that multiple agreements have indeed been formally established and provide basis for collaboration. However, a nuanced observation surfaces — the primary risk zone aligns with the natural mountain chain, rendering the practical necessity for extensive developments somewhat limited. Yet, in this landscape of collaboration, a gap is discerned from the Slovak perspective. Specifically, tools aimed at combatting plant and animal diseases emerge as an identified deficiency, prompting further consideration for bolstering this aspect of cross-border cooperation.</p> <p>Moving into the assessment of risk-oriented agreements, the overall availability of such agreements is marked as good, receiving a rating of 3. Notably, initiatives like the Visegrad 4 group, Euroregions, the European Grouping of Territorial Cooperation, and INTERREG are identified as comprehensive frameworks that effectively address a spectrum of issues within the cross-border context.</p> <p>An interesting prospect arises with the implementation of the Intersucho service for drought. Initially deployed in Slovakia, this service is recognised as having potential applicability in Poland, thereby necessitating support for cross-border projects of a similar nature.</p>	

POLAND - SLOVAKIA



Recommendations

Enhance Collaboration on Extreme Weather Preparedness:

Given the discrepancy in risk assessment regarding extreme weather (Poland: 4, Slovakia: 1), both countries should collaborate closely to improve preparedness and response mechanisms for extreme weather events. This could include sharing meteorological data, conducting joint training exercises, and developing coordinated response plans.

Address Disparities in Flood Risk Management:

Recognize and address the disparities in risk assessment for flooding (Poland: 5, Slovakia: 2). Collaborative efforts should focus on enhancing flood risk management strategies, including early warning systems, floodplain management, and infrastructure resilience measures, especially considering the seasonal floods related to melting snow.

Strengthen Governance Mechanisms for Plant and Animal Diseases:

Allocate additional resources and attention to address the risk of plant and animal diseases, which pose significant threats to forestry, food production, and ecosystem health. Develop joint intervention plans, enhance surveillance systems, and promote cross-border cooperation in disease control and prevention efforts.

Improve Collaboration on Cyber Threats and Migration:

Given the assessment of cyber threats (4) and migration (4.5) as above-average risks, enhance collaboration between Poland and Slovakia to address these challenges. Establish joint initiatives for cybersecurity awareness, information sharing on cyber threats, and coordinated responses to migration-related issues, including border security and humanitarian assistance.

Explore Alignment of Crisis Management Systems:

Explore opportunities to align crisis management systems between Poland and Slovakia to effectively address modern challenges such as hybrid attacks, terrorism, and migration. Assess the compatibility of existing governmental and non-governmental organizations responsible for crisis response and explore avenues for enhanced coordination and cooperation.

Improve Data Availability and Quality for Risk Assessment:

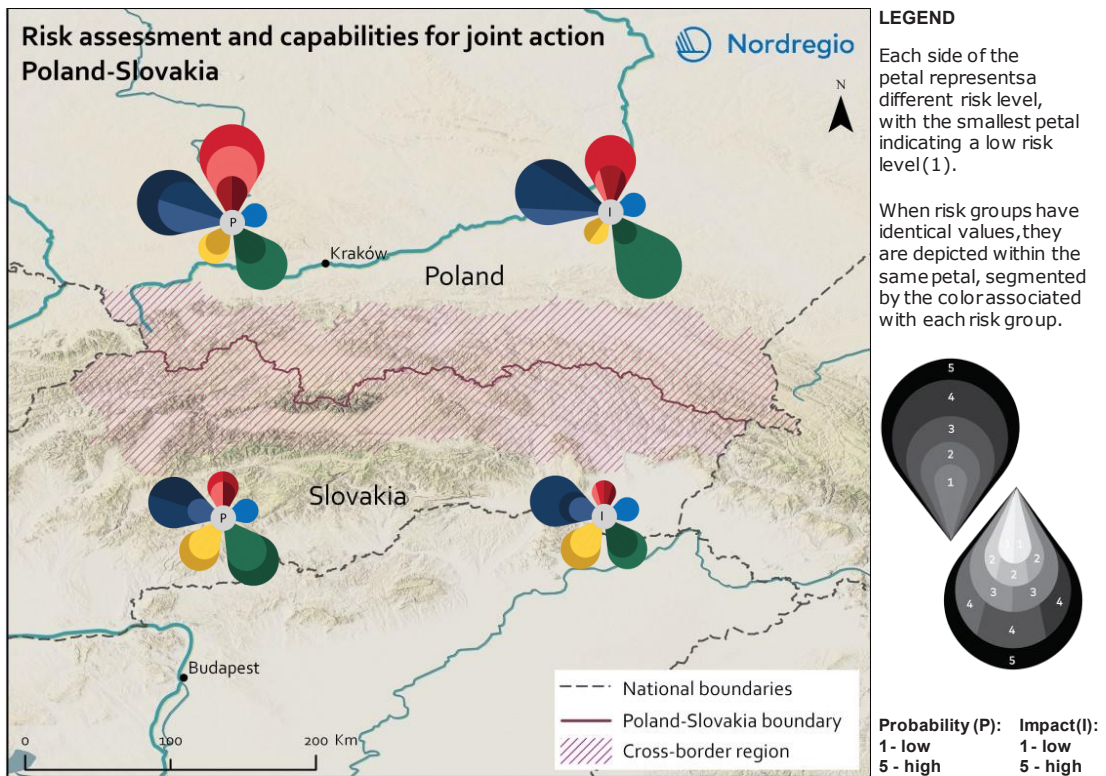
Invest in improving the availability and quality of data for risk assessment, particularly for animal and plant diseases where data gaps exist. Establish mechanisms for data sharing and collaboration between relevant agencies, research institutions, and international organizations to ensure comprehensive and accurate risk assessments.

Data availability/quality and resulting impact on reliability of the assessment

For Poland the availability and quality of the data was sufficient. The analysis draws mainly from the National risk assessments, the IT Country Protection System on preliminary flood risk assessment (GIS visualisation) of the border region, and on relevant bilateral agreements. Additionally, the most recent developments in migration data were examined using information from the Ministry of Home Affairs and Eurostat as well as from the recent academic publications.



The data availability for the risk caused by severe weather is assessed as good (3); the good availability of the data has a positive impact on the hydrological and climatological modelling for this cross-border region.

The main issue lies in the scarcity of data available for assessing the risk of animal and plant diseases.



ORANGE: high probability (3 or higher) and low capability (1.5 or lower)
RED: high impact (3 or higher) and low capability (1.5 or lower)
DARK RED: low capability comes along with both high probability and high impact

Table 46 ROMANIA - BULGARIA

ROMANIA - BULGARIA	 
<p><u>Overall review of risks</u></p> <p>Flooding (4.5), epidemics/pandemics (4.5), drought (3.5) and extreme weather (3.5) have all been assessed as above average risks, while animal/plant diseases have been addressed as average risks. There are slight discrepancies. All other risks are below average.</p>	
<p><u>Discrepancies in risk assessment</u></p> <p>There are slight discrepancies between the assessment carried out on the two sides of the border. Geophysical risks have been assessed with probability/likelihood at 4, as well as animal/plant diseases (3). There are similar assessments at low or no probability for several of the risks under technological and societal risks.</p>	
<p><u>Exposures and vulnerabilities</u></p> <p>On the Romanian side the most important risks include extreme weather (heatwaves), flooding, geophysical risks, epidemics, and pandemics. On the Bulgarian side, similarly to Romania, flooding is the main risk, as well as geophysical risk (due to seismic zone in Rom), and drought.</p>	
<p><u>Potential impact</u></p> <p>On the Romanian side infrastructure may significantly be impacted by flooding, geophysical risks, and the risk of disruption of critical infrastructure. Drought may have major impact on the economy and security of supply and functional capacity of population and services. Nuclear and radiological accidents, although of low probability, can have high impact. On the Bulgarian side flooding is assessed as risk that may have high impact, as well as geophysical risk, drought, and the risk of disruption critical infrastructure.</p>	
<p><u>Governance readiness and gaps</u></p> <p>There are few slight discrepancies between the capabilities to address risks between the two sides of the border. Both sides agree that flooding is well addressed (3), as well as nuclear / radiological accidents (3). Similar results can be seen for wildfires assessed on both sides of the border at 2.</p>	
<p><u>Availability/gaps of cross-border tools/agreements</u></p> <p>The most comprehensive governance framework exists for addressing flooding, driven in part by the requirements of the Floods Directive. The framework in relation to nuclear and radiological accidents is well established. INTERREG projects as part of Bulgaria-Romania CBC Programme contributed to strengthening the governance processes. For example, the INSECTRISK project contributed to enhancing governance related to the risk of animal/plant diseases, developing integrated mechanisms for mosquito population control and joint risk management. Similarly, the MARINEGEOHAZARD project has facilitated the development of a joint early warning monitoring system to address hazardous geological processes along the Bulgarian-Romanian Black Sea coast. Steps were taken for preparing combined seismic maps in a transboundary context.</p> <p>There is a bilateral agreement for emergency situations, but the cross-border context of the existing framework is insufficient. There is a clear governance gap in addressing the high risk of epidemics/pandemics on both sides of the border. Additionally, for both drought and extreme weather, which are also assessed as high risks, there are low capabilities on both sides of the border. Similar results can be seen for animal/plant diseases, assessed as an average risk.</p>	
<p><u>Recommendations</u></p> <p>Enhance Cross-Border Cooperation on Epidemic/Pandemic Preparedness:</p> <p>Establish joint cooperation mechanisms between Romania and Bulgaria to enhance preparedness and response efforts for epidemics and pandemics. This can include sharing information on disease outbreaks, coordinating healthcare responses, and conducting joint training exercises.</p> <p>Strengthen Governance Mechanisms for Drought and Extreme Weather:</p> <p>Focus on strengthening governance mechanisms to address drought and extreme weather, which pose significant risks to both Romania and Bulgaria. Develop joint intervention plans, share information, and support knowledge transfer initiatives to improve preparedness and response capabilities.</p> <p>Improve Data Sharing and Quality for Enhanced Risk Assessment:</p> <p>Enhance data sharing and quality assurance mechanisms to improve the reliability of risk assessments on both sides of the border. Establish joint databases and monitoring systems to collect and analyse relevant data on emerging risks, ensuring that decision-making is based on accurate and up-to-date information.</p>	

ROMANIA - BULGARIA



Expand Existing Cooperation Frameworks to Address Governance Gaps:

Expand existing bilateral agreements and cross-border cooperation frameworks to address governance gaps identified in the management of various hazards. Foster collaboration between relevant agencies and stakeholders to develop comprehensive strategies and policies for risk mitigation and response.

Promote Capacity Building and Public Awareness Initiatives:

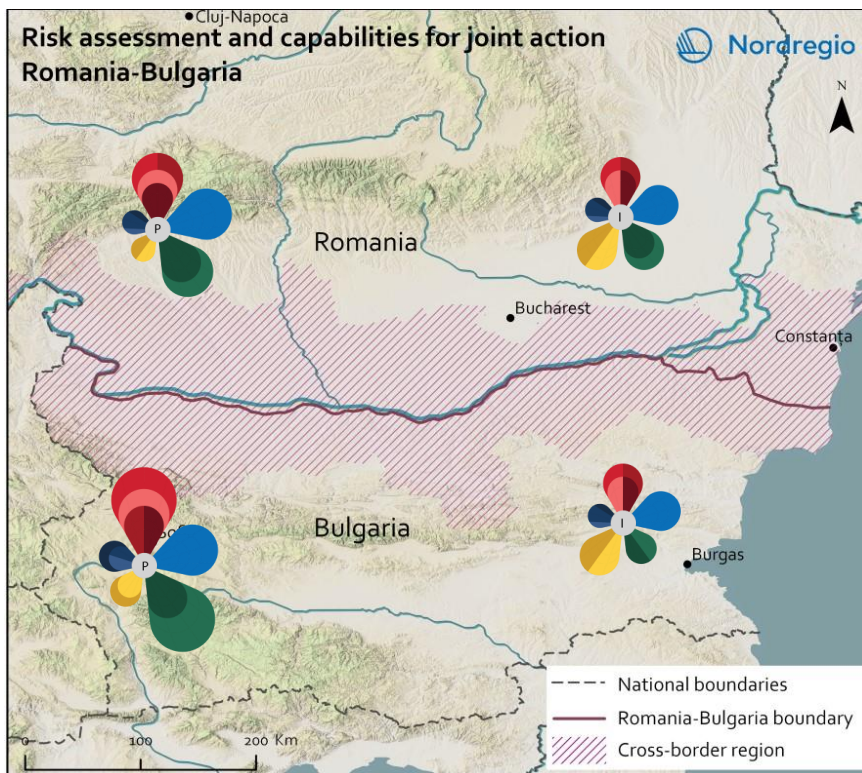
Invest in capacity building initiatives for local authorities, emergency responders, and healthcare professionals to enhance their skills and capabilities in disaster management. Additionally, promote public awareness and education campaigns to inform communities about risks and encourage proactive measures for prevention and preparedness.

Continuous Efforts on Geophysical Risks and Animal/Plant Diseases:

Implement continuous efforts to address geophysical risks and animal/plant diseases, which are assessed as significant risks in the cross-border territory. Conduct risk assessments, develop joint intervention plans, and support collaborative research initiatives to mitigate these risks effectively.

Data availability/quality and resulting impact on reliability of the assessment



No bilateral agreements with regards societal challenges were found. The availability of data in cross-border context is relatively modest.



		Probability		Impact		Capability
		Romania	Bulgaria	Romania	Bulgaria	Average
Meteorological and hydrological	extreme weather	3	4	1.67	2	1
	flooding	4	5	2.67	3	3
	drought	4	3	2.67	2.5	0.5
	wild fires	2	3	1.5	1.83	2
Geohazards	geophysical risk	4	4	3	3.17	2
Biological	epidemics / pandemics	4	5	2.67	1.83	0.5
	animal & plant diseases	3	3	1.67	1.5	1
Technological	nuclear & radiological emergencies	1	1	3	3.17	3
	disruption of critical infrastructure	1	2	3	3.17	1
Societal	terrorism	1	1	1	1	0.5
	cyber threats	1	1	1	1	0.5
	migration	1	2	1	1	1.5

ORANGE: high probability (3 or higher) and low capability (1.5 or lower)
RED: high impact (3 or higher) and low capability (1.5 or lower)
DARK RED: low capability comes along with both high probability and high impact

Table 47 ROMANIA - SERBIA

ROMANIA - SERBIA	 
<p><u>Overall review of risks</u></p> <p>The most likely hazards (i.e. average above 3) are: 1. Epidemics/Pandemics (4) 2. Geophysical hazards (3,5).</p> <p>Meteorological/hydrological hazards are considered as medium-level risks as in the border. Technological and societal risks are considered as low across the two sides of the border.</p>	
<p><u>Discrepancies in risk assessment</u></p> <p>The evaluation of risks is similar across the border, with few exceptions: Flooding (4 in Romania, 2 in Serbia); Geophysical Hazards (3 in Serbia, 4 in Romania, due to the risk of landslides across the Danube); Terrorism (2 in Serbia, 1 in Romania).</p>	
<p><u>Exposures and vulnerabilities</u></p> <p>In the context of the RO/SRB cross-border region, Serbia is vulnerable to extreme weather conditions, mostly floods, droughts, and wildfires. Since Serbia is on the Western Balkan migration routes from South Europe and Middle East, is affected by migration flows. On the Romanian side the major risks include flooding (due to the Danube as a border river), geophysical risks and epidemics. Housing and production capacities are significantly exposed to flooding.</p>	
<p><u>Potential impact</u></p> <p>The extreme weather risks for Serbia may have significant impact on economy and households, as well as production. Cyberattacks, epidemics and pandemics are other notable impacts from Serbian side. With regards to Romania flooding, geophysical risks are considered of high impact.</p>	
<p><u>Governance readiness and gaps</u></p> <p>Governance readiness seems to be low on the Serbian side. Governance readiness appears to be also generally low on the Romanian side (yet higher readiness levels are detected in most Meteorological and hydrological hazards).</p>	
<p><u>Availability/gaps of cross-border tools/agreements</u></p> <p>The Romania-Serbia (RO/SRB) border has several bilateral and cooperation agreements focusing on protection against natural and man-made disasters. Positive developments at the local level include the establishment of collaborative agreements for emergency situations and methodologies for risks with cross-border impact, as part of the INTERREG-IPA CBC Romania-Serbia Programme. These efforts aim to enhance the operational and institutional capacity of local authorities responsible for disaster prevention. Additionally, joint intervention rules for addressing floods and earthquakes in border regions have been elaborated through collaborative efforts. Particularly in flood risks, there is a well-established cooperation framework and capability on both sides of the border.</p> <p>There are gaps in the governance framework with regards to the risk of epidemics/pandemics, geophysical risks, as well as several meteorological and hydrological hazards. Therefore, possible policy measures can be focused on risk assessment, development of joint intervention plans, information exchange, joint trainings, etc.</p>	
<p><u>Recommendations</u></p> <p>Enhance Cross-Border Cooperation on Epidemic/Pandemic Preparedness:</p> <p>Establish joint cooperation mechanisms between Romania and Serbia to enhance preparedness and response efforts for epidemics and pandemics. This can include sharing information on disease outbreaks, coordinating healthcare responses, and conducting joint training exercises.</p> <p>Strengthen Governance Mechanisms for Geophysical Risks:</p> <p>Focus on strengthening governance mechanisms to address geophysical risks, such as landslides and forest fires, which pose significant hazards in the cross-border territory. Promote research collaboration, data sharing, and comprehensive risk assessment methodologies to mitigate these risks effectively.</p> <p>Improve Data Sharing and Quality for Enhanced Risk Assessment:</p> <p>Enhance data sharing and quality assurance mechanisms to improve the reliability of risk assessments on both sides of the border. Establish joint databases and monitoring systems to collect and analyse relevant data on emerging risks, ensuring that decision-making is based on accurate and up-to-date information.</p>	

ROMANIA - SERBIA



Develop Joint Intervention Plans for Cross-Border Risks:

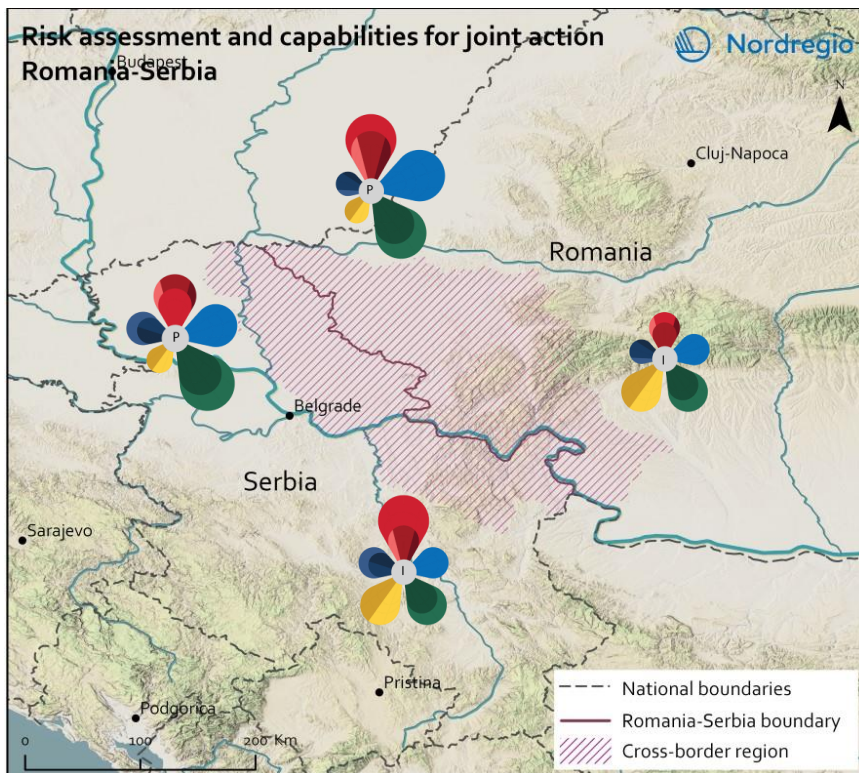
Collaborate on the development of joint intervention plans for risks with cross-border impacts, such as floods and earthquakes. Establish common protocols for emergency response and information exchange to facilitate coordinated actions during crises.

Promote Capacity Building and Public Awareness Initiatives:

Invest in capacity building initiatives for local authorities, emergency responders, and healthcare professionals to enhance their skills and capabilities in disaster management. Additionally, promote public awareness and education campaigns to inform communities about risks and encourage proactive measures for prevention and preparedness.

Data availability/quality and resulting impact on reliability of the assessment

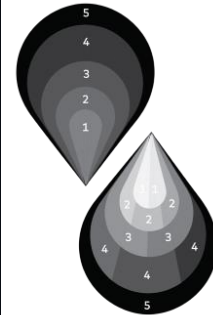
Data have been modest for potential risks, especially in relation to the cross-border region, reflecting the lack of bilateral agreements.



LEGEND

Each side of the petal represents a different risk level, with the smallest petal indicating a low risk level (1).

When risk groups have identical values, they are depicted within the same petal, segmented by the color associated with each risk group.




Probability (P):
1 - low
5 - high

Impact (I):
1 - low
5 - high

		Probability		Impact		Capability
		Romania	Serbia	Romania	Serbia	Average
Meteorological and hydrological	extreme weather	3	3	1.67	1.67	1.5
	flooding	4	2	2.33	3.83	2
	drought	3	3	1.33	1.83	1
	wild fires	3	3	1.83	1.83	1.5
Geohazards	geophysical risk	4	3	1.83	1.83	1.5
Biological	epidemics / pandemics	4	4	2.67	2.67	1
	animal & plant diseases	3	3	1.67	1.67	1
Technological	nuclear & radiological emergencies	1	1	2.67	2.67	2
	disruption of critical infrastructure	1	1	3	3	1
Societal	terrorism	1	2	1	2	1
	cyber threats	1	1	1	1	1.5
	migration	1	1	1	1	1.5

ORANGE: high probability (3 or higher) and low capability (1.5 or lower)
RED: high impact (3 or higher) and low capability (1.5 or lower)
DARK RED: low capability comes along with both high probability and high impact

Table 48 SWEDEN - FINLAND

SWEDEN - FINLAND 
<p><u>Overall review of risks</u></p> <p>Both sides of the border consider all risks above average (more than 3.5), except for Nuclear and radiological accidents assessed at 2.5, animal and plant diseases assessed at 3.0, and terrorism assessed at 1.5. The risks with the highest average score are: Extreme weather (4,5); Migration (4,5); Flooding (4); Drought (4); Wildfires (4); Epidemics, pandemics (4); Disruption of critical infrastructure (4); Cyber threat (4).</p>
<p><u>Discrepancies in risk assessment</u></p> <p>The evaluation of risks is generally similar across the two sides of the border, with a few exceptions: Drought (3 in Sweden, 5 in Finland); Animal and plant diseases (2 in Sweden, 4 in Finland); Nuclear and radiological accidents (1 in Sweden, 4 in Finland); Cyber threats (3 in Sweden, 5 in Finland).</p>
<p><u>Exposures and vulnerabilities</u></p> <p>The border region on the Swedish side is particularly exposed to wildfires, geophysical risks (landslides, flash floods, avalanches) as well as flooding. Although the probability of nuclear and radiological accidents is assessed as very low, the consequences are considered very serious.</p>
<p><u>Potential impact</u></p> <p>The highest impact is associated with wildfires, geophysical risks, and nuclear and radiological risks, as well as flooding for the Swedish side of the border.</p>
<p><u>Governance readiness and gaps</u></p> <p>For both the Swedish and Finnish regions along the border, medium to low levels of readiness are reported for all risks, with significant gaps in governance processes in relation to biological and societal risks. Higher levels of readiness are identified for extreme weather, flooding, wildfires, and disruption of critical infrastructure.</p>
<p><u>Availability/gaps of cross-border tools/agreements</u></p> <p>Existing cooperation agreements among border municipalities within the Nordred framework cover mutual assistance in various emergencies, including fire-fighting, rescue operations, oil spill clean-ups on land and at sea, urgent medical transport, and nuclear accidents. Knowledge exchange and joint exercises were previously organised under the Barents Rescue initiative. Additionally, the joint plan for water management in the Tornio river basin exemplifies collaboration aimed at enhancing preparedness for flood-related risks. Despite these established collaborations, there remains significant potential for further development of joint actions, particularly in areas concerning biological and societal risks.</p>
<p><u>Recommendations</u></p> <p>Enhance Cross-Border Collaboration on Wildfire Management:</p> <p>Strengthen cooperation between Sweden and Finland in wildfire management, including joint training exercises, sharing of resources, and harmonization of firefighting strategies. Develop common protocols for cross-border assistance during wildfire emergencies to ensure a coordinated response.</p> <p>Improve Infrastructure Resilience to Extreme Weather and Flooding:</p> <p>Invest in enhancing the resilience of critical infrastructure, such as roads, bridges, and utilities, to withstand extreme weather events and flooding along the cross-border region. Implement measures to mitigate the impacts of flooding, especially in areas prone to flash floods and river overflow.</p> <p>Address Gaps in Governance Processes for Biological and Societal Risks:</p> <p>Develop comprehensive governance frameworks and protocols to address biological risks, such as epidemics and pandemics, and societal risks, such as migration and terrorism. Establish cross-border agreements and coordination mechanisms to facilitate information sharing and joint response efforts.</p> <p>Strengthen Preparedness for Nuclear and Radiological Risks:</p> <p>Enhance readiness and response capabilities for nuclear and radiological accidents, despite their low probability. Conduct joint exercises and training programs to ensure effective coordination between Swedish and Finnish authorities in the event of such incidents.</p>

SWEDEN - FINLAND



Expand Cross-Border Cooperation on Risk Management Initiatives:

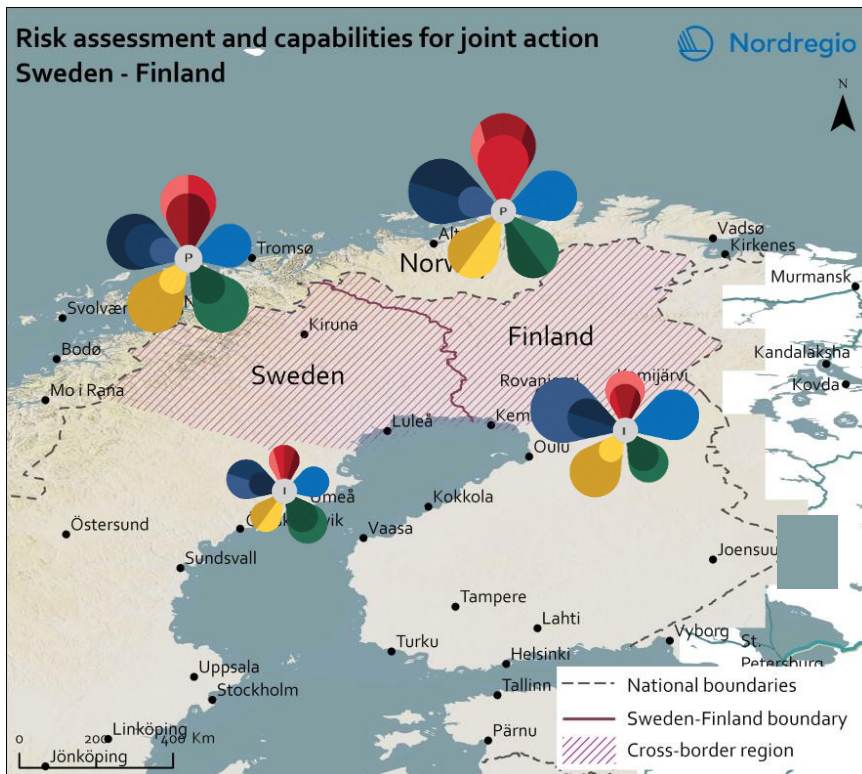
Explore opportunities to expand existing cross-border cooperation initiatives, such as Nordred and joint water management plans, to address a wider range of risks. Foster collaboration between local municipalities and regional authorities to exchange knowledge and best practices in risk management.

Improve Data Sharing and Quality for Enhanced Risk Assessment:

Enhance data sharing and quality assurance mechanisms to improve the reliability of risk assessments on both sides of the border. Establish joint databases and monitoring systems to collect and analyse relevant data on emerging risks, ensuring that decision-making is based on accurate and up-to-date information.

Data availability/quality and resulting impact on reliability of the assessment

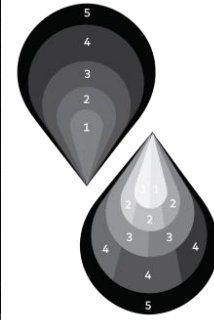
For Finland, data availability and quality were sufficient, drawing mainly from regional risk assessments. For Sweden, data gaps exist as the national risk assessment is not detailed, and not all risks were covered in expert interviews.



LEGEND

Each side of the petal represents a different risk level, with the smallest petal indicating a low risk level (1).

When risk groups have identical values, they are depicted within the same petal, segmented by the color associated with each risk group.



Probability (P):
1 - low
5 - high

Impact (I):
1 - low
5 - high



		Probability		Impact		Capability
		Sweden	Finland	Sweden	Finland	Average
Meteorological and hydrological	extreme weather	4	5	2	3	2
	flooding	4	4	2	2	2
	draught	3	5	1.5	1.75	1
	wild fire	3	5	2	2	2
Geohazards	geophysical risk	3	4	2	4.25	1
Biological	epidemics/pandemics	4	4	2.67	2.5	0
	animal & plant diseases	2	4	1.83	2	0
Technological	nuclear & radiological accidents	1	4	1.5	1.25	1.5
	disruption of critical infrastructure	4	4	2.17	3.5	2
Societal	terrorism	1	2	3	4.75	1
	cyber threats	3	5	3	3.25	1
	migration	4	5	1	2.5	1

ORANGE: high probability (3 or higher) and low capability (1.5 or lower)

RED: high impact (3 or higher) and low capability (1.5 or lower)

DARK RED: low capability comes along with both high probability and high impact

Table 49 SWEDEN - NORWAY

SWEDEN - NORWAY	 
<p><u>Overall review of risks</u></p> <p>Both meteorological / hydrological and geohazard risks are considered high on the SE/NO border, with little discrepancies between the two sides of the border. Wildfires are especially disconcerting. Nuclear and radiological accidents, animal and plant diseases, and terrorism is considered low risk. The most relevant risks with an average above 3.5 are: Wildfires; Extreme weather; Flooding; Geophysical risk; Disruption of critical infrastructure; Cyber threats; Drought.</p>	
<p><u>Discrepancies in risk assessment</u></p> <p>The evaluation of risks is similar across the border, except for the following: Geophysical risks (3 in Sweden, 5 in Norway); Epidemics/pandemics (4 in Sweden, 2 in Norway); Nuclear and radiological accidents (1 in Sweden, 3 in Norway); Cyber threats (3 in Sweden, 5 in Norway).</p>	
<p><u>Exposures and vulnerabilities</u></p> <p>Vulnerabilities are considered the highest to extreme weather, flooding (especially in the mountainous areas), wildfires and geophysical risks (landslides in Norway) particularly due to their impact on infrastructure, electricity, and telecommunications networks. Due to long distances and sparse settlement structure, the cross-border region relies on a well-functioning infrastructure.</p>	
<p><u>Potential impact</u></p> <p>The highest potential impact is associated with extreme weather, wildfires, flooding, and landslides (the Norwegian side). Also, impacts of terrorism, epidemics and pandemics, as well as cyber threats are considered substantial.</p>	
<p><u>Governance readiness and gaps</u></p> <p>Governance readiness for joint action at the local level, particularly within the framework of Nordred, is well-established for addressing wildfires, other natural disasters, and various emergencies and crises.</p>	
<p><u>Availability/gaps of cross-border tools/agreements</u></p> <p>Within the framework of the Border Rescue Councils (Nordred), the Haga Declaration, and Barents Rescue, a strong collaboration focusing on joint exercises and training exists. However, the Barents Rescue initiative is currently on pause due to Russia's suspension but might be revived in a new format after 2024. The issues of total defence and civil preparedness are increasingly prominent on the collaboration agenda, particularly in light of Sweden's accession to NATO. In the northernmost regions of Sweden, Norway and Finland, the recent establishment of Governors North, a regional-level platform for civil protection, has further enhanced governance capabilities to manage a wide array of risks.</p>	
<p><u>Recommendations</u></p> <p>Enhance Cross-Border Collaboration on Wildfire Management:</p> <p>Strengthen cooperation between Sweden and Norway in wildfire management, including joint training exercises, sharing of resources, and harmonization of firefighting strategies. Develop common protocols for cross-border assistance during wildfire emergencies to ensure a coordinated response.</p> <p>Improve Infrastructure Resilience to Extreme Weather and Flooding:</p> <p>Invest in enhancing the resilience of critical infrastructure, such as electricity and telecommunication networks, to withstand extreme weather events and flooding along the cross-border territory. Implement measures to mitigate the impacts of flooding, especially in mountainous regions prone to flash floods.</p> <p>Address Geophysical Risks Through Joint Mitigation Efforts:</p> <p>Collaborate on mitigating geophysical risks, including landslides and other geological hazards, through joint risk assessments, early warning systems, and infrastructure improvements. Share best practices and lessons learned in geohazard management to enhance preparedness and response capabilities.</p> <p>Strengthen Cybersecurity Cooperation and Information Sharing:</p> <p>Enhance cooperation on cybersecurity between Sweden and Norway, including sharing threat intelligence, conducting joint cybersecurity exercises, and developing common strategies to address cyber threats. Establish mechanisms for rapid information exchange and coordinated response to cyber incidents.</p>	

SWEDEN - NORWAY



Enhance Preparedness for Epidemics and Pandemics:

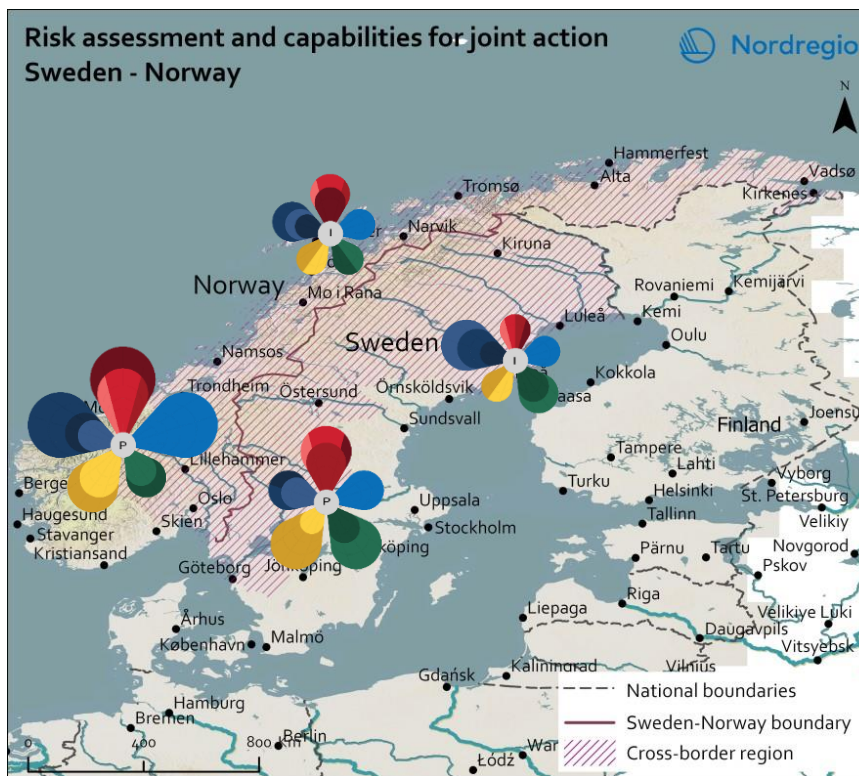
Improve preparedness and response capabilities for epidemics and pandemics through joint training and capacity-building initiatives. Develop coordinated public health strategies and protocols for cross-border communication and collaboration in managing infectious disease outbreaks.

Revitalize Cross-Border Initiatives and Agreements:

Explore opportunities to revitalize cross-border initiatives and agreements, such as the Barents Rescue initiative, to strengthen regional cooperation on disaster preparedness and response. Seek new formats for collaboration and engagement, considering geopolitical developments and changing security dynamics.

Data availability/quality and resulting impact on reliability of the assessment

For Sweden, the data availability is sufficient and is mainly based on findings from the GrenseRoS risk analysis report for the Swedish-Norwegian border from 2016. The national risk assessment lacks detail and not all risks were covered in expert interviews. For Norway, the availability and quality of the data was sufficient. The analysis draws mainly from the county RVA, complemented by expert interviews.



LEGEND

Each side of the petal represents a different risk level, with the smallest petal indicating a low risk level (1).

When risk groups have identical values, they are depicted within the same petal, segmented by the color associated with each risk group.

Probability (P):
1 - low
5 - high

Impact (I):
1 - low
5 - high



		Probability		Impact		Capability
		Sweden	Norway	Sweden	Norway	Average
Meteorological and hydrological	extreme weather	4	4	2.33	3	1.5
	flooding	4	4	2.17	2.67	1.5
	drought	3	4	1.5	2.83	0
	wild fire	4	5	2	1.67	2.5
Geohazards	geophysical risk	3	5	2	1.83	2.5
Biological	epidemics/pandemics	4	2	2.67	2.17	1
	animal & plant diseases	2	3	1.83	1.67	1.5
Technological	nuclear & radiological emergencies	1	3	1.5	1.67	2.5
	disruption of critical infrastructure	4	4	2.17	1.67	2
Societal	terrorism	2	2	3.5	2	1
	cyber threats	3	5	3	3	2.5
	migration	3	3	1	1.33	2

ORANGE: high probability (3 or higher) and low capability (1.5 or lower)

RED: high impact (3 or higher) and low capability (1.5 or lower)

DARK RED: low capability comes along with both high probability and high impact

Table 50 SLOVENIA - CROATIA

SLOVENIA - CROATIA	
	 
<u>Overall review of risks</u>	
<p>Meteorological/Hydrological hazards and geohazards are considered above average or average on the border, as well as cyber threats and migration assessed as average. All other risks are assessed as below average in probability/likelihood.</p>	
<u>Discrepancies in risk assessment</u>	
<p>There are no discrepancies in the two assessments of each side of the border, as both sides have evaluated the probability/likelihood of the risk to occur as exactly the same.</p>	
<u>Exposures and vulnerabilities</u>	
<p>Vulnerabilities are considered the highest to drought in agriculture, particularly as a large part of agricultural areas along the border are on vulnerable aquifers where abstraction demand is high, or in hilly areas where irrigation is difficult. Extreme weather, wildfires and floods may affect housing, production capacity and agricultural land. Mass illegal migration was an issue in the area; however the exposure was reduced when Croatia joined the Schengen area. Part of the area is vulnerable to nuclear risk due to the Krško Nuclear Plant which is located close to the border. Large parts of the border are sparsely populated and therefore rely on good quality infrastructure, particularly the heavily forested area between Ilirska Bistrica and Bela Krajina.</p>	
<u>Potential impact</u>	
<p>The highest potential impact is associated with extreme weather, wildfires, flooding, earthquakes, nuclear accidents, and cyber threats.</p>	
<u>Governance readiness and gaps</u>	
<p>Both sides of the border have similar capabilities to address risks, with high capability to handle flooding and nuclear/radiological accidents, medium capability for some risks, and low capability for others. However, both sides lack capability to address drought.</p>	
<u>Availability/gaps of cross-border tools/agreements</u>	
<p>A number of cross-border agreements have been signed and there is good cooperation both at national and local/regional levels for historic reasons.</p>	
<u>Recommendations</u>	
Develop Joint Drought Management Strategies:	
<p>Collaborate on the development of joint drought management strategies to address vulnerabilities in agriculture along the border. Implement measures to improve water resource management and irrigation practices to mitigate the impacts of drought on agricultural production.</p>	
Enhance Coordination for Disaster Response:	
<p>Strengthen coordination mechanisms for disaster response, particularly for extreme weather events, wildfires, and floods. Establish protocols for cross-border assistance and resource-sharing to ensure a timely and effective response to emergencies.</p>	
Improve Preparedness for Nuclear Risk:	
<p>Enhance preparedness measures for nuclear risk associated with the Krško Nuclear Plant. Conduct joint exercises and training programs to ensure effective response and communication in the event of a nuclear accident, considering the potential transboundary impacts.</p>	
Address Governance Gaps for Cyber Threats and Migration:	
<p>To address governance gaps in addressing cyber threats and migration, utilize existing bilateral agreements and cooperation frameworks. Strengthen information sharing and collaboration between relevant authorities to enhance cybersecurity measures and manage migration flows.</p>	
Promote Community Engagement and Awareness:	
<p>Promote community engagement and awareness initiatives on both sides of the border to increase resilience to natural and man-made hazards. Conduct outreach programs, workshops, and training sessions to empower local communities to prepare for and respond to emergencies.</p>	

SLOVENIA - CROATIA

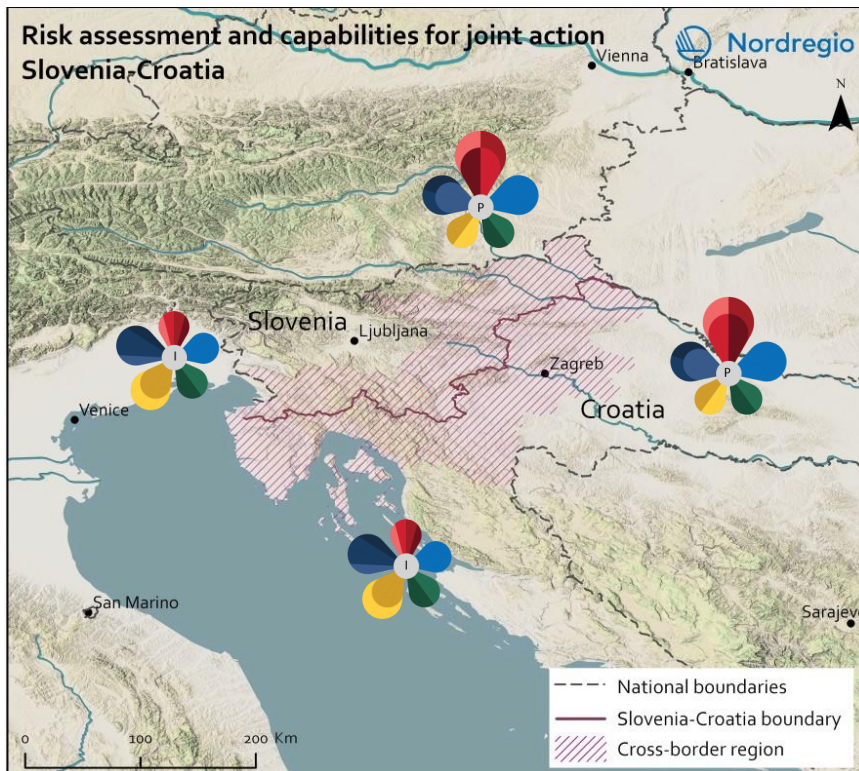


Facilitate Data Sharing and Exchange:

Improve data sharing and exchange mechanisms between Slovenia and Croatia to enhance the reliability of risk assessments and decision-making processes. Establish platforms for the exchange of hydrometeorological data and other relevant information to support evidence-based risk management strategies.

Data availability/quality and resulting impact on reliability of the assessment

For Slovenia, data is sufficient and based on various sectoral risk assessments as well as environmental data and reports available on the web portal of the Environment Agency. Some of the risk assessments lack sufficient detail of the border regions. For Croatia, data are based on various strategies and programmes as well as on some project reports, and data for some of the topics are insufficient. Availability for interviews on the level of national authorities was low, thus the input from the interviews was limited.



LEGEND

Each side of the petal represents a different risk level, with the smallest petal indicating a low risk level (1).

When risk groups have identical values, they are depicted within the same petal, segmented by the color associated with each risk group.



Probability (P):
1 - low
5 - high

Impact (I):
1 - low
5 - high



	Probability		Impact		Capability	
	Slovenia	Croatia	Slovenia	Croatia	Average	
Meteorological and hydrological	extreme weather	4	4	2	2	1
	flooding	3	3	1.83	1.83	3
	drought	4	4	2.33	2.33	0
	wild fire	3	3	2.33	2.33	1
Geohazards	geophysical risk	3	3	2.33	2.33	1
Biological	epidemics/pandemics	2	2	1.5	1.5	1
	animal & plant diseases	2	2	1.5	1.5	1
Technological	nuclear & radiological accidents	2	2	3.33	3.33	3
	disruption of critical infrastructure	2	2	1.67	1.67	1
Societal	terrorism	2	2	2.5	2.5	2
	cyber threats	3	3	3.33	3.33	1
	migration	3	3	2.5	2.5	2

ORANGE: high probability (3 or higher) and low capability (1.5 or lower)

RED: high impact (3 or higher) and low capability (1.5 or lower)

DARK RED: low capability comes along with both high probability and high impact

Table 51 SLOVENIA – ITALY

SLOVENIA – ITALY	 
<p><u>Overall review of risks</u></p> <p>Wildfires, drought and geophysical risks are the risks that are top priority in the area, as it is a karstic area prone to droughts and consequently extensive wildfires and has experienced several devastating earthquakes.</p>	
<p><u>Discrepancies in risk assessment</u></p> <p>There are discrepancies between the risk assessments for floods (2 in Slovenia, 5 in Italy). Drought risks are assessed similarly on both sides of the border (5 in Slovenia, 4 in Italy). Wildfires and geophysical risks are the most relevant ones (assessed for both sides of the border as 5). Additionally, for Italy disruption of critical infrastructure was assessed as 5, whereas for Slovenia as 2. There are discrepancies in the assessment of hazards between the two border regions mainly due to subjectivity in the evaluation conducted by the experts (due to the lack of publicly available data) and/or by the interviewees as well as the differences in natural characteristics.</p>	
<p><u>Exposures and vulnerabilities</u></p> <p>The presence of urban areas and infrastructure near the Italian side of the border makes the area more exposed and therefore more vulnerable to the following hazards: wildfires, geophysical risks, and flooding. These risks are the most important also on the Slovenian side of the border, alongside extreme weather and drought.</p>	
<p><u>Potential impact</u></p> <p>For the Italian side, given the systemic nature of most of the risks considered, most sectors of society could be impacted at the border, especially in the case of extreme weather event and geophysical risks.</p>	
<p><u>Governance readiness and gaps</u></p> <p>Cooperation is high due to historic circumstances of the Treaty of Osimo signed by Italy and Yugoslavia in 1975 (of which Slovenia is a successor) that included cooperation in the field of water management, road and water links the protection of the Adriatic against pollution, and cooperation of ports. This resulted in good cooperation between civil protection, first aid and police on both sides of the border. Furthermore, the INTERREG Programme includes measures for joint DRM at least since 2007, resulting in several cross-border DRM projects since then.</p>	
<p><u>Availability/gaps of cross-border tools/agreements</u></p> <p>Italy and Slovenia have a good level of cross-border cooperation, also at sub-national level. The number of bilateral agreements, joint projects and initiatives show a strong relationship on DRM topics. For instance, cooperation between the civil protection of Slovenia and the Friuli Venezia Giulia region is well developed, especially regarding seismic risk and wildfires. Specifically, the cross-border territory shared between the two countries and Austria shows excellent cooperation in the cross-border management of seismic risk in all phases of the risk management cycle.</p>	
<p><u>Recommendations</u></p> <p>Address Discrepancies in Risk Assessment:</p> <p>Foster dialogue between Slovenia and Italy to address discrepancies in risk assessment, particularly regarding floods and disruption of critical infrastructure. Harmonize methodologies and criteria for risk evaluation to ensure consistency and accuracy across borders.</p> <p>Strengthen Governance and Cooperation:</p> <p>Continue to strengthen cross-border governance structures and cooperation mechanisms to improve preparedness and response capabilities. Enhance coordination and information sharing between Slovenia and Italy to facilitate joint response efforts in the event of emergencies.</p> <p>Focus on High-Priority Risks:</p> <p>Prioritize efforts to strengthen the management of high-priority risks such as wildfires, drought, and geophysical risks. Develop joint strategies and action plans to mitigate these risks and improve resilience, with a focus on areas where urbanization and critical infrastructure are most exposed.</p>	

SLOVENIA – ITALY



Enhance Monitoring and Surveillance:

Improve monitoring and surveillance systems to detect and respond to potential threats to critical infrastructure and natural hazards. Enhance collaboration between relevant agencies and authorities to share information and coordinate response efforts in case of emergencies.

Promote Bilateral and Trilateral Agreements:

Advocate for the development of bilateral and trilateral agreements between Slovenia, Italy, and Austria to address specific risks affecting the border region. Strengthen collaboration on seismic risk management, wildfires, and hydro-geological hazards, leveraging successful cross-border projects and initiatives.

Capacity Building and Technical Assistance:

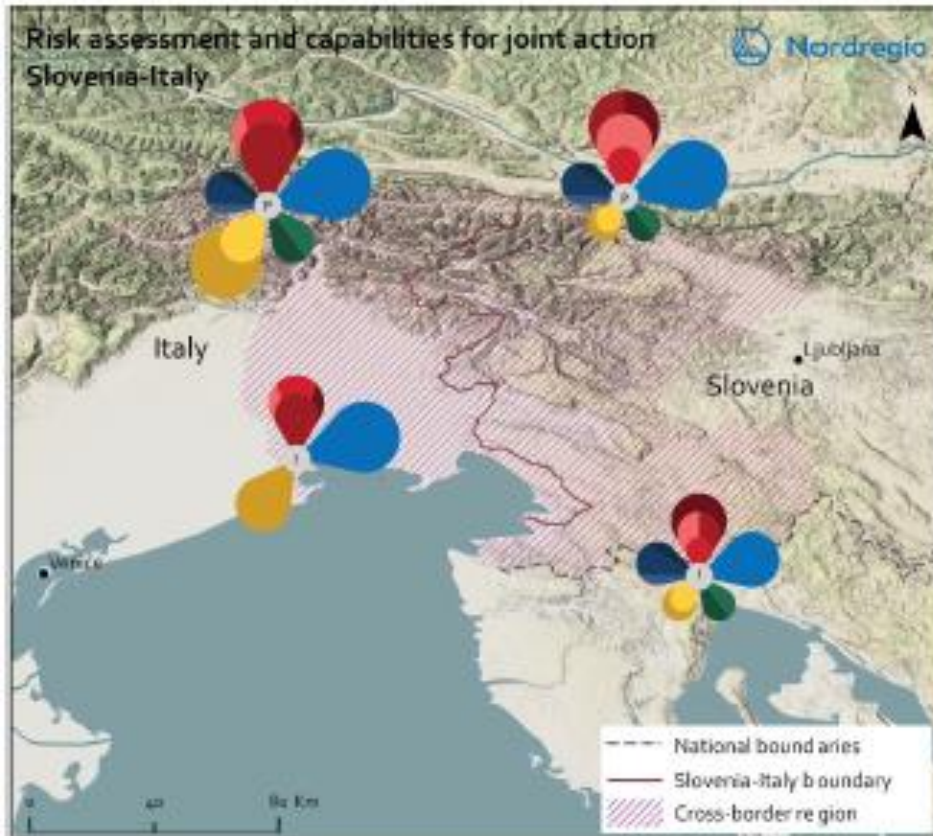
Invest in capacity building programmes and provide technical assistance to enhance the skills and expertise of stakeholders involved in disaster risk management. Offer training workshops, exercises, and exchange programmes to build resilience and improve response capabilities across the border.

Enhance Public Awareness and Community Engagement:

Increase public awareness and community engagement initiatives to promote disaster preparedness and resilience. Launch joint awareness campaigns, educational programs, and community-based initiatives to empower local communities and improve response readiness.

Data availability/quality and resulting impact on reliability of the assessment

All the scores included for the Italian side are qualitative and subjective, as the NRA does not include a specific quantitative assessment on this border and/or does not assess specific risks, such as societal risks - data on societal risks, such as terrorism, are sensitive data and are not publicly available. At the same time, the other documents consulted provide information not fully in line with the methodology used in this study. Hence, when possible, the authors evaluated the scores on the basis of publicly available data and information or based on expert interviews. The same applies to Slovenia.



LEGEND

Each side of the petal represents a different risk level, with the smallest petal indicating a low risk level (1).

When risk groups have identical values, they are depicted within the same petal, segmented by the color associated with each risk group.



Probability (P):
1 - low
6 - high

Impact (I):
1 - low
6 - high

		Probability		Impact		Capability
		Slovenia	Italy	Slovenia	Italy	Average
Meteorological and hydrological		4	5	2.67	4	2
		2	6	1.33	4	1.6
		5	4	3.17	3	3
		5	5	3.83	4	3
Geohazards		5	5	3.83	5	3
Biological		2	3	1.5	-	
		2	3	1.5	-	
Technological		1	3	1	-	
		2	5	1.5	4	
Societal		3	3	2.83	-	
		3	3	3.33	-	
		3	3	2.5	-	

ORANGE: high probability (3 or higher) and low capability (1.5 or lower)
RED: high impact (3 or higher) and low capability (1.5 or lower)
DARK RED: low capability comes along with both high probability and high impact

Table 52 FINLAND – ESTONIA

FINLAND – ESTONIA	
<u>Overall review of risks</u>	Epidemics/pandemics, animal and plant diseases, as well as disruption of critical infrastructure and mass population displacement emergencies, were assessed as high risks, while nuclear and radiological risks as well as terrorism were evaluated as low.
<u>Discrepancies in risk assessment</u>	There were no big discrepancies in risk assessment on both sides of the border. From the Estonian side, the environmental risks were evaluated low (1), while from the Finnish side these were evaluated rather high (4).
<u>Exposures and vulnerabilities</u>	The border is fully a maritime border. The border is vulnerable on critical infrastructure in the waters of the Baltic Sea – mainly gas pipeline and electricity cables.
<u>Potential impact</u>	The impact depends on the scope of damage of the critical infrastructure in the Baltic Sea – all critical infrastructure is backed up thus the impact cannot be too big, but in case of larger damage it can influence the volume of energy supply in surrounding countries as well as affect the quality of the Baltic Sea.
<u>Governance readiness and gaps</u>	There are bilateral agreements in place covering all risks.
<u>Availability/gaps of cross-border tools/agreements</u>	In the area of geophysical risks there are only bilateral agreement in place, but no activities were detected.
<u>Recommendations</u>	<p>Address Discrepancies in Risk Assessment:</p> <p>Foster dialogue between Finland and Estonia to address discrepancies in risk assessment, particularly regarding environmental risks. Harmonise methodologies and criteria for risk evaluation to ensure consistency and accuracy across the cross-border region.</p> <p>Strengthen Governance and Cooperation:</p> <p>Continue to strengthen cross-border governance structures and cooperation mechanisms to improve preparedness and response capabilities. Enhance coordination and information sharing between Finland and Estonia to facilitate joint response efforts in the event of emergencies.</p> <p>Focus on High-Priority Risks:</p> <p>Prioritize efforts to strengthen the management of high-priority risks such as epidemics/pandemics, animal and plant diseases, and disruption of critical infrastructure. Develop joint strategies and action plans to mitigate these risks and improve resilience.</p> <p>Enhance Monitoring and Surveillance:</p> <p>Improve monitoring and surveillance systems to detect and respond to potential threats to critical infrastructure in the Baltic Sea. Enhance collaboration between maritime authorities to share information and coordinate response efforts in case of emergencies.</p> <p>Promote Bilateral Agreements:</p> <p>Advocate for the development of bilateral agreements between Finland and Estonia to address specific risks, including geophysical risks and mass population displacement emergencies. Strengthen collaboration on immigration and refugee management, particularly in response to regional security concerns.</p> <p>Capacity Building and Technical Assistance:</p> <p>Invest in capacity building programs and provide technical assistance to enhance the skills and expertise of stakeholders involved in disaster risk management. Offer training workshops, exercises, and exchange programs to build resilience and improve response capabilities across borders.</p>

FINLAND – ESTONIA



Enhance Public Awareness and Community Engagement:

Increase public awareness and community engagement initiatives to promote disaster preparedness and resilience. Launch joint awareness campaigns, educational programs, and community-based initiatives to empower local communities and improve response readiness.

Data availability/quality and resulting impact on reliability of the assessment

Data availability and quality were generally good, with most data collected from publicly available sources. However, there was a lack of data on geophysical risks and mass population displacement emergencies, impacting the reliability of the assessment in these areas.

Table 53 CENTRAL BALTIC

CENTRAL BALTIC
<p><u>Overall review of risks</u></p> <p>Meteorological and hydrological as well as biological risks are considered rather high risks. The risks with the lowest probability are geophysical and nuclear/radiological accidents.</p>
<p><u>Discrepancies in risk assessment</u></p> <p>The evaluation of most risks is similar. There are two risks evaluated differently: probability of epidemics/pandemics (2 in Estonia, 4 in Latvia, 5 in Finland) and draught (1 in Estonia, 3 in Latvia, 4 in Finland).</p>
<p><u>Exposures and vulnerabilities</u></p> <p>The Central Baltic border is a maritime border. The area is vulnerable to epidemics/pandemics, but also because of the presence of critical infrastructure between Finland and Estonia – mainly gas pipeline and electricity cables.</p>
<p><u>Potential impact</u></p> <p>The potential impact could be pollution of the Baltic Sea. In the event of a risk to critical infrastructure in the Baltic Sea, the impact depends on the extent of damage to the infrastructure. Since all critical infrastructure is backed up, the impact cannot be too significant, but in the case of more extensive damage, it could influence the volume of energy supply in surrounding countries.</p>
<p><u>Governance readiness and gaps</u></p> <p>Governance readiness to address risks is quite equal across Estonia, Latvia and Finland – there are relevant cross-border agreements in place covering all risks, except geophysical and nuclear/radiological accidents.</p>
<p><u>Availability/gaps of cross-border tools/agreements</u></p> <p>Cross-border cooperation is well-covered for meteorological and hydrological risks, and mostly for societal risks. However, there are no agreements in place for geophysical and nuclear/radiological accidents.</p>
<p><u>Recommendations</u></p> <p>Address Discrepancies in Risk Assessment:</p> <p>Foster dialogue between Estonia, Latvia, and Finland to address discrepancies in risk assessment, particularly for hazards such as epidemics/pandemics and drought. Establish joint methodologies and criteria for risk evaluation to ensure consistency and accuracy.</p> <p>Strengthen Governance and Cooperation:</p> <p>Enhance cross-border governance structures and cooperation mechanisms to improve preparedness and response capabilities, especially for geophysical and nuclear/radiological accidents. Develop collaboration agreements and protocols for joint response efforts in the event of such emergencies.</p> <p>Focus on High-Priority Risks:</p> <p>Prioritize efforts to strengthen the management of high-priority risks such as epidemics/pandemics and drought. Enhance coordination and information sharing among relevant agencies and stakeholders to facilitate timely and effective response measures.</p> <p>Enhance Monitoring and Surveillance:</p> <p>Improve monitoring and surveillance systems for early detection and response to potential threats, particularly in the maritime environment. Enhance collaboration between maritime authorities to share information and coordinate response efforts in case of pollution incidents or other maritime hazards.</p> <p>Promote Bilateral Agreements:</p> <p>Advocate for the development of bilateral agreements between Estonia, Latvia, and Finland to address specific risks and establish cooperation frameworks for disaster risk management, including geophysical and nuclear/radiological accidents. Strengthen collaboration on immigration and mass population displacement in emergencies, especially in light of regional security concerns.</p>

CENTRAL BALTIC

Capacity Building and Technical Assistance:

Invest in capacity building programs and provide technical assistance to enhance the skills and expertise of stakeholders involved in disaster risk management. Offer training workshops, exercises, and exchange programs to build resilience and improve response capabilities across borders.

Enhance Public Awareness and Community Engagement:

Increase public awareness and community engagement initiatives to promote disaster preparedness and resilience. Launch joint awareness campaigns, educational programs, and community-based initiatives to empower local communities and improve response readiness.

Data availability/quality and resulting impact on reliability of the assessment

Data was sufficiently available on the majority of risks. Data addressing geophysical and nuclear/radiological accidents was rather difficult to find.

GETTING IN TOUCH WITH THE EU

In person

All over the European Union there are hundreds of Europe Direct information centres. You can find the address of the centre nearest you at: https://europa.eu/european-union/contact_en

On the phone or by email

Europe Direct is a service that answers your questions about the European Union. You can contact this service:

- by freephone: 00 800 6 7 8 9 10 11 (certain operators may charge for these calls),
- at the following standard number: +32 22999696, or
- by email via: https://europa.eu/european-union/contact_en

FINDING INFORMATION ABOUT THE EU

Online

Information about the European Union in all the official languages of the EU is available on the Europa website at: https://europa.eu/european-union/index_en

EU publications

You can download or order free and priced EU publications from: <https://op.europa.eu/en/publications>. Multiple copies of free publications may be obtained by contacting Europe Direct or your local information centre (see https://europa.eu/european-union/contact_en).

EU law and related documents

For access to legal information from the EU, including all EU law since 1952 in all the official language versions, go to EUR-Lex at: <http://eur-lex.europa.eu>

Open data from the EU

The EU Open Data Portal (<http://data.europa.eu/euodp/en>) provides access to datasets from the EU. Data can be downloaded and reused for free, for both commercial and non-commercial purposes.



Publications Office
of the European Union