

Bucharest

Aim

Based on impact chains of compounding events, we aim to collaboratively engage stakeholders in identifying which components of the hazard-impact-vulnerability-mitigation nexus require prioritized attention, to prevent (more) severe impacts from earthquakes striking Bucharest.

Why

The increased frequency and power of multi-hazards added layers of complexity in Disaster Risk Management, calling for a next generation of multi-risk assessment frameworks.

Why Bucharest

Bucharest is one of Europe's most endangered capitals to earthquakes, where not only seismic hazard is at high levels, but also exposure and vulnerability.

Where do we want to go

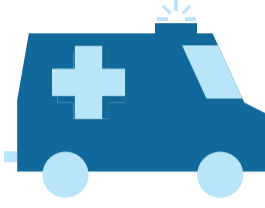
Grounded in the dynamic background of Bucharest, the developed tools will support national organizations in emergency intervention through developing a Multi-Hazard Risk Assessment framework tailored for this capital city.

Geographical area

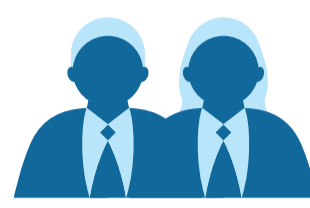


Bucharest, Romania, 44° 26' 22.7868" N, 26° 5' 46.7016" E

Stakeholders



First responders



Local administration and decision-makers

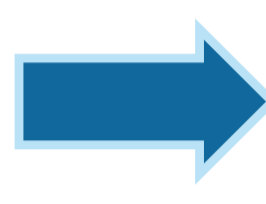


Law experts, engineers, seismologists, scientists

Hazards

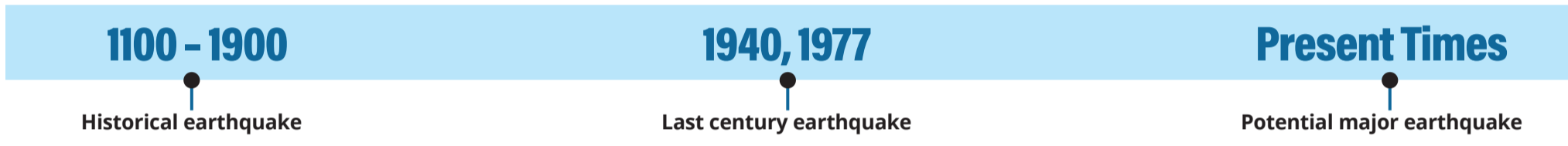


Earthquake



Flood

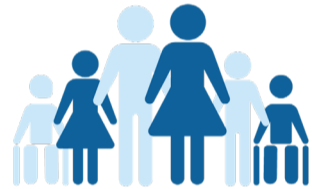
Timeline of impact chains



Sectors



Civil protection



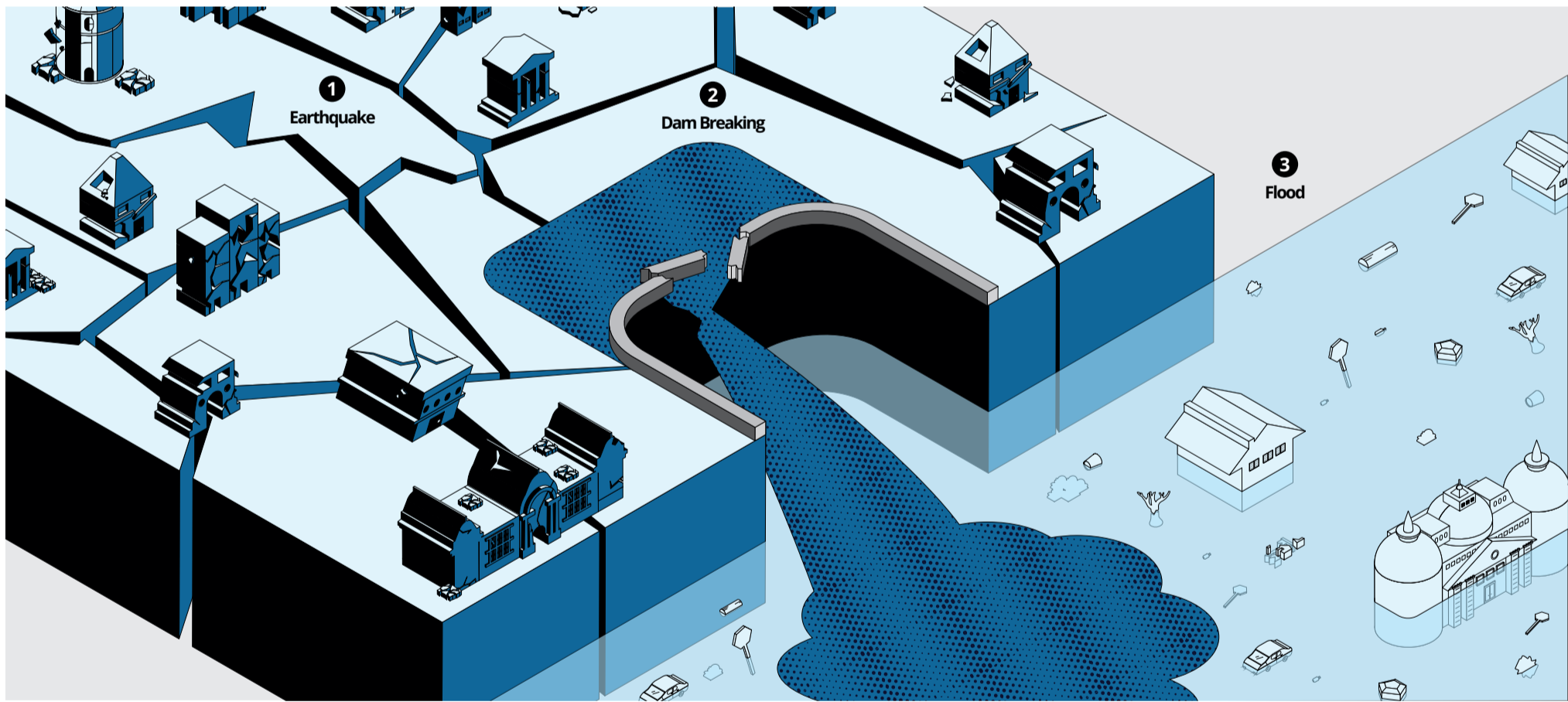
Society



Emergency system



Medical sector



Research Methodology

The Case Study relies on **Impact Chains to examine and re-evaluate the effects of the Vrancea earthquakes** that affected Bucharest from historical periods through the present day.

Three Impact Chains were built, focusing on the **historical earthquakes of 1100-1900**, the **recent earthquakes in 1940 and 1977**, and a **powerful earthquake (over 7 MW) that could strike Bucharest in present times**.

Multi-criteria decision-making analysis, analytical methods for estimating building loss, numerical simulations of flooding in case of a dam break, Network-risk methodology and the GIS toolbox, psychometric research, interviews, focus group approaches, and workshops will help build present situation Impact Chains.

Vulnerability will be assessed through indicators of social and economic metrics using the additive approach of the Multi-Criteria Decision-Making analysis in GIS, highlighting **complex vulnerability hotspots related to different hazard scenarios**.

Complementarily, physical vulnerability (expressed as different building damage levels) will be quantified based on analytical methods. **The consequences of a major earthquake projected in the response intervention travel times** will also be integrated into the risk assessment.

Risk mitigation will be enhanced by gaining a deeper understanding of vulnerability based on **earthquake risk perception and disaster preparedness behavior**. The multi-hazard vulnerability and coping capacities will be analyzed collaboratively by engaging both authorities and locals, relying on **participatory tools** (PGIS, psychometric research, and focus groups).

Expected Results

01 A comprehensive Impact Chain-based overview of the outcomes of historical and more recent earthquake events that hit Bucharest, which can help identify potential impacts of future earthquakes.

02 A sound assessment of potential building loss and road blockages in Bucharest, obtained by applying the proposed multi-method framework.

03 Focused snapshots of key vulnerabilities that significantly contribute the earthquake impacts and have to be given top priority in terms of mitigation efforts.

04 Co-produced insights and multi-method-based scientific findings that can be integrated in emergency response planning, guiding the **improvement of current strategies**.



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