CapaCities

Disaster Risk Management Capacity Development

for Cities in Eastern Neighbourhood Countries

Seismic retrofitting investments in multi-hazard perspective

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კატასტროფის რისკის მართვის შესაძლებლობების განვითარება

Dezvoltarea Capacităţilor de Management al Riscurilor de Dezastre

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INTRODUCTION

Reducing risk and improving disaster resilience are common international challenges that should not only be addressed at national level, but even more so locally. To supplement the ongoing 'top-down' efforts to improve national and transnational resilience as part of the implementation of the Sendai Framework, also a 'bottom-up' strengthening of local competence and action is needed. Impacts of disasters are felt the first at local level. Local governments are the 'first line of defence', both in terms of prevention and preparedness.

The philosophy is that reducing disaster risks and increasing resilience requires a long-term local strategy that can outlast the short-term political agenda, as well as a local system of governance, capacities and resources that is realistic and sustainable. This starts from 'understanding risk' to inform a concrete and holistic DRM strategy. To reduce disaster risks, local governments have some of the most fundamental policy instruments, if multi-hazard Disaster Risk Management (DRM) can be effectively mainstreamed into local policies such as spatial planning, building code enforcement, economic development and local infrastructure investments. However, local governments across the world struggle with mainstreaming DRM, because of budget constraints and limited capacities and capabilities.

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To be able to assess risks, to use this to develop a DRM strategies and actions, as well as to mainstream DRM in a participatory process with local stakeholders, cities need to develop their capacities and capabilities. This is a gradual process of acquiring skills and knowledge, using existing good practices and gaining practical experience by actually starting to work on a structured DRM cycle.

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PROJECT OBJECTIVES AND OUTCOMES

The general objective is to structurally improve the capacities of the three partner cities to lead and coordinate a structured process of DRM planning. The expected outcomes are:

1. Increased **knowledge** in the three cities about DRM.
2. Strong and **competent DRM focal points**, able to lead the development of DRM in the cities the following years in cooperation with local stakeholders.
3. Increased **self-insight** of the city administrations in their own situation regarding DRM capabilities and potential areas of improvement.
4. Development of **network relations** with the local DRM stakeholders of the three cities, as a start for a structured cooperation on DRM.
5. Development of **holistic local DRM strategies and road maps** to further improve DRM in the three cities in the following years.

The project provides a curriculum to develop the competences of local 'DRM focal points', that is combined with actual local actions such as a self-assessment of current local capacities, a multi-hazard risk assessment, a peer review between the cities and development of a holistic DRM strategy.

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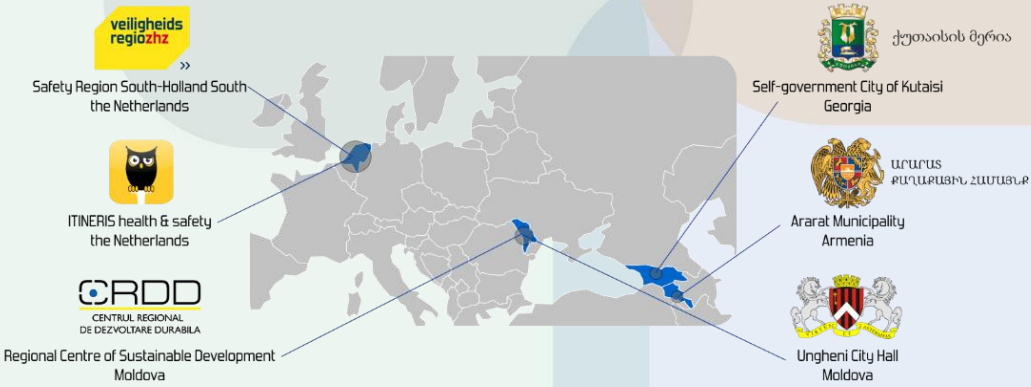
PARTNERSHIP

The CapaCities project is a cooperation of these six partners from the EU and its neighbours. The Safety Region South-Holland South is lead partner of the project and coordinates the project in close cooperation with the Core Team partners ITINERIS health & safety and the Regional Centre of Sustainable Development (PA RCSD) from Moldova. The recipient cities are Ararat in Armenia, Kutaisi in Georgia and Ungheni in Moldova.



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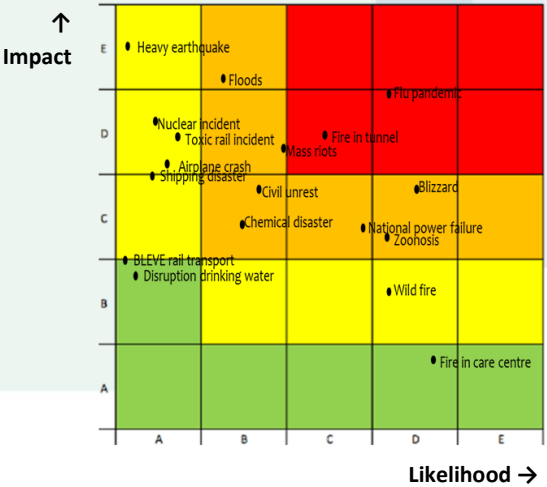
UNDERSTANDING SEISMIC RISK IN MULTI-HAZARD PERSPECTIVE

Local governments work on Disaster Risk Management from a holistic, multi-hazard perspective. This means that in local risk assessments and DRM strategies seismic hazards are included, but amongst a whole range of other hazards. The EU standard for disaster risk assessment promotes a multi-hazard, multi-impact and multi-stakeholder approach. In such an approach, risk scenarios are assessed on the elements of likelihood and impact and represented in a risk matrix. The impacts include human health & safety, damages & economy, environmental impact and social-political impacts. In this kind of approach seismic hazards very often can be found in the top left-hand corner of the risk matrix: high impact but relatively low likelihood. The lesson is that such kinds of 'intensive risks' require specific attention in terms of risk communication, in order to increase the risk perception and obtain an adequate level of political and societal priority for local retrofitting actions.



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SEISMIC MICROZONATION TO INFORM URBAN PLANNING

Land use and spatial planning provide the most fundamental options for local governments to reduce risks. To inform decisions on where not to allow construction, where to order retrofitting and where to implement higher building code norms, local governments are in need not only of seismic hazard maps, but also of geological maps that show the differences in potential seismic shaking. At least one of the cities in the CapaCities project found a specific urban area built on river sediments that combines a higher level of shaking with vulnerable constructions. This kind of practical insights is not only helpful for local governments, but also achievable within their limited resources and lack of specific seismic knowledge.

BUILDING CODE IMPLEMENTATION AND ENFORCEMENT

Both Armenia and Georgia are currently revising their national building codes, including seismic provisions. These new Codes include provisions on spatial and urban development planning, principles for construction and quality assurance of buildings, rules for issuing construction permits and ensuring construction supervision. The provisions of the Code have been under review, to bring it in line with modern standards and in particular, the EuroCodes. The focus now shifts to sustainable implementation at local level in the long term. This is no small effort, since all engineers have to be re-educated in completely new concepts. The lesson is that local governments will have to give serious priority to implementation and enforcement of these new Codes.

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INFORMING SEISMIC RETROFITTING INVESTMENTS

In order to inform decisions on retrofitting and upgrading of buildings, local governments need to understand the specific vulnerability of their building stock. This requires a methodology that uses a set of simple, measurable and implementable indicators that together provide a valid vulnerability categorization with a high confidence level. The requirement for the indicators is that they are present in current databases or can be easily obtained/assessed for the current building stock. Moreover, the categorization has to provide an easy applicable granularity that holds water in terms of validity and confidence level.

Basic indicators of the **construction's vulnerability** might include:

- Main construction material and load bearing system (such as reinforced concrete frame/wall, rein-forced/unreinforced brick and stone masonry, wood frame/wall/ post & beam, steel braced/moment frame)
- Age (such as pre-Soviet, Soviet, Post-Soviet era)
- Height (such as low, medium, high rise, and tall buildings)
- Structural irregularities (such as 'soft' storey, i.e. first floor has lower stiffness than the rest of the building, and complex buildings with large openings or discontinuous load paths).

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- Foundation type (such as shallow/deep footings, piles, presence of substructures such as basement, underground parking, etc.)

Basic indicators of **human vulnerability** for those buildings might include:

- Building occupancy
- Presence of vulnerable groups (children, elderly, disabled, ill and injured)

In addition, the relative importance of the buildings' usage can be used to categorize **performance categories** (as an indication for both the priority and extent of seismic retrofitting), for example by distinguishing between:

- Low importance: low occupancy or minor storage buildings
- Normal importance: ordinary buildings for which we want to protect the life and safety of building occupants and the general public.
- High importance: buildings that are likely to be used as post-disaster shelters (including schools), are cultural heritage that has to be safeguarded or have a particular risk of creating cascading effects in case of collapse, such as production and storage of hazardous goods.
- Post-disaster buildings: buildings that are essential to the provision of emergency services and therefore not only

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need to protect the occupants' lives, but also should maintain their functionality.

Together these categories of vulnerability and importance can be combined with levels of exposure to seismic hazards, to inform prioritization of seismic retrofitting investments.

In the CapaCities project the three cities experiment with this approach, to test its practical applicability.

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RELATED PROJECTS

The MiSRaR project (Mitigation Spatial Relevant Risks in European Regions and Town, 2010-2012) addressed the issue of mitigating relevant hazards through the inclusion of risk assessment and risk management in spatial planning. The project developed an integrated approach towards risk mitigation to assist regional and local governments in developing their mitigation plan for spatial relevant risks. The lessons were summarized in the MiSRaR handbook. www.misrar.eu

In the PRISMA project (Promoting and Implementing Strategies for Risk Management and Assessment, 2013-2014) the first objective was to test the cross-sectoral implementation of the risk assessment and risk management (prevention) strategies as described MiSRaR handbook. The second objective was to promote risk management and organize knowledge exchange between other local, regional and provincial governments and cross-sectoral risk management partners within the EU. www.prismaproject.eu

The aim of the CRISMAS project (Community for Risk Management and Assessment, 2016-2017) was to support regions and cities implementing an all hazard risk assessment and developing a holistic DRM strategy. www.crismaseurope.eu

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www.drm-capacities.eu

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