Introducing the recommended heatwave vulnerability assessment framework for the LIFE COOL ZONE project

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Project partners:

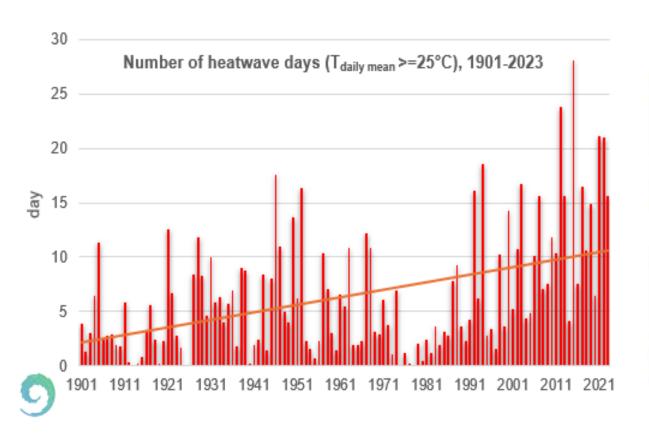
Ministry of Public Administration and Regional Development (lead partner), HungaroMet, Lechner Knowledge Centre, Municipality of Debrecen, Municipality of Oradea, Association of Climate Friendly Municipalities.

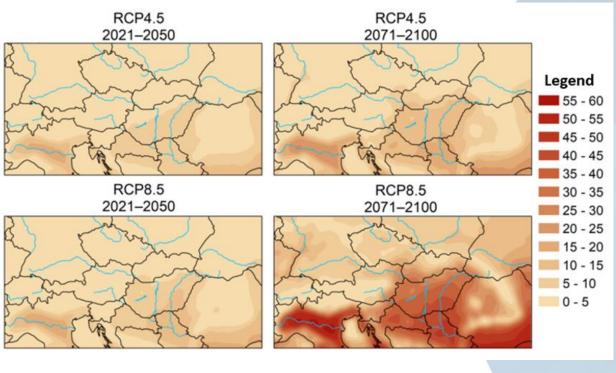






Background – heatwaves





Number of heatwave days in Hungary between 1901 and 2023 based on homogenized, verified, interpolated data series.

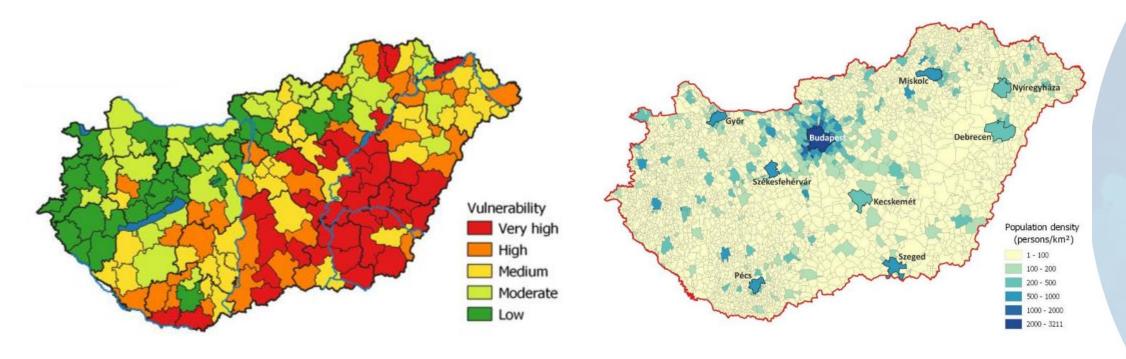
Source: HungaroMet Nonprofit Ltd.

Expected change in the number of heatwave days in the 21st century between the moderate (RCP4.5 - above) and the rapidly increasing (RCP8.5 - bottom) emission scenarios - RCA4\EC-EARTH climate model simulations.

Source: NAGiS, source of basic data: EURO-CORDEX, SMHI



Scientific basis for intervention areas



Complex vulnerability to the effects of heat waves at district level in Hungary

Source: HungaroMet Nonprofit Ltd.

Population density differences of Hungary (2023)

Source: Hungarian Central Statistical Office



NAGIS VULNERABILITY ASSESSMENT MODEL STRUCTURE

EXPOSURE SENSITIVITY NON CLIMATE FACTORS Weather dependency Climate parameters • Socio-economic drivers Weather conditions Adaptation strategies Natural disasters **ADAPTIVE CAPACITY POTENCIAL IMPACT VULNERABILITY**

Project concept

SURFEX surface model

Climate
Vulnerability
Assessments
(CVA)

CCA interventions, NbS focus

High vulnerability

Impact of heatwaves in cities, heat island effect

Pilots: Functional Urban Areas of Debrecen (HU) and Oradea (RO)

Detailed FUA-level CVAs

Neighbourhood-level analysis

8 major regional
centre cities:
Budapest, Győr
Szeged, Pécs
Székesfehérvár,
Nyíregyháza, Miskolc,
Kecskemét

Statistical CVAs

Urban blocks

Public areas (streets, squares)



Utilisation of the heatwave vulnerability assessment results in the project

Integrating knowledge set & databases into decision support systems

- Web-based GIS application and Adaptation Planning Decision Support Tool.
- Integration of new layers into the NAGiS.

Planning, development and testing of integrated solutions to mitigate heatwave & UHI effect at the FUA scale

- Identifying the most at-risk neighbourhoods as the result of spatial vulnerability assessments to enable municipalities to prioritize interventions in areas with the highest exposure to heatwaves.
- Assessing and mapping of potential adaptation opportunities.

Promoting nature-based solutions to reduce the negative impacts of extreme heatwaves

- Identifying low-cost, innovative nature-based solutions (e.g. green roofs, rain gardens) and other adaptation solutions (architectural, traffic management etc.).
- Demonstrating the co-benefits of green infrastructure, and other innovative solutions, including improvements in microclimates, public health and urban aesthetics.

Improving (cross-border) cooperation between municipalities to reduce health effects of heatwaves

- Developing a methodological guide for planning heatwave interventions, complemented by a collection of good practices.
- Drawing on the results of the Climate Vulnerability Assessment to upgrade the participatory decision-making methodology and incorporating it into the decision-making process to enhance decision-making efficiency and transparency.





Potential applications of the project results

Support Programme for innovative project ideas:

- Collaborative environment
- Developing and exchanging best practices
- Integration of resources and expertise
- Climate adaptation measures implemented through financial support for municipal developments

Replication potential:

- Climate Vulnerability
 Assessment Methodology for which database and new thematic map layers will be integrated to the NAGiS
- Climate Platforms
- Pilot projects implemented in Debrecen and Nagyvárad
- Good practices used in other FUAs/cities

Upscaling potential:

- Integrated Municipal Decision Support Platform for Public and Private Sector Scaling
- Emphasizing FUA-level planning and cooperation in regional development
- After-LIFE Conservation Plan

Strategies for multiplying impact:

- Dissemination of knowledge and best practices
- Policy recommendations incorporated into municipal, FUA-level and national sectoral planning
- Organizing networking events to encourage collaboration across regions facing similar challenges



Thank you for your attention!

