

# Social vulnerability to heatwaves – from assessment to implementation of adaptation measures in Košice and Trnava, Slovakia <sup>[1]</sup>

Image from Climate Adapt about this case study

[2]

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High temperatures and heatwaves in the summer pose increasing risks to people living in Slovakian cities. In particular older people and children, those living on top floors in poorly insulated buildings, and those relying on facilities such as nurseries, schools or care homes are prone to heat stress. The Carpathian Development Institute, in collaboration with local authorities in Trnava and Košice, carried out an assessment of vulnerability to high temperatures and heatwaves in residential environment, taking into account the social aspects. Factors such as presence of older people, children and location of facilities serving these vulnerable groups were considered.

Based on the results of the assessment, adaptation strategies are being implemented in both Trnava and Košice, including measures such as thickening of tree stands in parks, building and restoration of water elements (blue infrastructure) and fountains in most vulnerable places, actions aiming at changing citizen behavior during heatwaves, etc., Moreover, a neglected public open space in a vulnerable area in Trnava was redesigned to provide shading through planting of trees and other vegetation.

## Case Study Description

### Challenges:

Both Trnava and Košice face increasing temperatures. In Košice, ten hottest years in the last 150 years have occurred since 1990, and the annual mean temperature between 1881 and 2100 has increased by 1.6°C. Number of tropical days (mean temperature above 30 °C) has increased in the last 20 years from 12 to 20 days (in the year 2012 it was 37 days) and the maximum temperature frequently exceeds 34°C. Similarly, in Trnava, summers are getting hotter and winters are getting warmer (although the winter temperatures are increasing at a slower rate than summer temperatures). The annual number of summer days (mean temperature above 25 °C) is projected to rise from 58 (1961–1990) to 100 (2051–2100). The annual number of tropical days will rise from 12 to 36 in the same periods. Both cities are likely to be affected by longer and more severe droughts in the future. Whilst in Trnava the precipitation is slightly decreasing (more substantially in winter), in Košice the total amount of precipitation remains steady, whilst there are more torrential rains possibly causing flooding interspersed with dry periods.

### Objectives:

Trnava (population of about 68,000 inhabitants) is extremely vulnerable to the urban heat island effect, due to its historical character associated with high proportion of paved surfaces, which exacerbate heat stress during periods of high temperature. In Košice (population of about 240,000 inhabitants), large proportion of residents are living in prefabricated blocks of flats, prone to overheating in high temperatures.

The Carpathian Development Institute, in collaboration with local authorities, carried out an assessment of vulnerability to high temperatures of the entire city of Trnava and the densely populated and materially deprived Zapad district (40,000 inhabitants) in Košice. The assessment was a basis for the development of a range of actions aiming to improve the adaptation capacity of Trnava and Košice to climate change and heatwaves in

particular.

### **Importance and relevance of the adaptation:**

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Additional Details

### **Stakeholder engagement:**

The vulnerability assessment supporting the identification and implementation of adaptation measures was carried out by the Carpathian Development Institute, which developed the methodology and provided the expert leadership for the project. In Košice, the Mayor of the Zapad borough provided political support for the project and the civil servants provided the necessary data. Additional expertise was provided by the Slovak Hydro-meteorological Institute and the Regional Office of Public Health.

Local authorities were closely involved in the vulnerability assessment in both cities. The development of the adaptation strategies (for 10-15 years) and the adaptation action plans (for 3 years, with concrete adaptation measures and allocated responsibilities and finance) was a collaborative effort between the Carpathian Development Institute and local authorities.

During the project in Košice, local citizens were consulted (through a survey) on their perceived need for the adaptation planning in their area, as well as on the preferred type of adaptation measures. The planning and implementation of the pilot greening project in Trnava was carried out by the local authority, but the idea was consulted with the district committee including local residents. Moreover, in Trnava, the citizens and local organisations can propose adaptation measures to be funded by the city through a participatory budget mechanism.

### **Success and limiting factors:**

Slovakia is currently revising its National Adaptation Strategy, but has not developed a national adaptation action plan yet; the initiative in Košice and Trnava was carried out in the absence of national regulations. Therefore, there is little support on adaptation for local authorities from the national level. Alongside Trnava and the Zapad borough of Košice, only Bratislava and Kezmarok have developed adaptation plans to date. Therefore, overall, there is a limited willingness of the local authorities to invest their resources into the systematic adaptation process.

At the city level, other limitations are associated with the local authority officials, being overwhelmed by their day-to-day activities. Also the novelty of the climate adaptation topic and its multispectral character make it a difficult subject to tackle by representatives of local authorities.

A major success factors was strong commitment from the city leadership. In Košice, a strong enabling factor was the support from the local Mayor interested in the adaptation agenda. In Trnava, the interest of the local government officials in climate change and the willingness to learn drove their participation in the international conference *Climate Change and Local Development – Challenge for Local Governments* (March 2012, Bratislava). Following the event, the representatives of Trnava City actively looked for support in development of their adaptation action plan. The solution was found in the joint project led by Carpathian Development Institute dealing with the assessment of vulnerability to high temperatures and heatwaves. The collaborative nature of the project was one of the success factors. The availability of external funding was also crucial in completion of the vulnerability assessment and development of the climate change adaptation plans.

### **Budget, funding and additional benefits:**

In Košice, funding for the development of the Zapad Adaptation Strategy was provided through the project “Climcross Development: Partnership for addressing climate change impacts on development” run within the Hungary-Slovakia Cross-border Co-operation Programme 2007–2013.

In Trnava, funding was provided by the project “Cities resilient to Climate Change Impacts” inspired by city of Trnava, which was funded via Swiss Financial Mechanism (SFM). The SFM financed mainly the development of

the Adaptation Strategy, but 20,000 euros were provided for tree seedlings, which were planted and are being maintained by the Trnava city. The grant/participatory budget scheme aiming to support small-scale adaptation measures (minimum 10,000 euro a year) is financed from the city budget.

#### **Legal aspects:**

There is no legal framework in Slovakia specifically supporting urban adaptation to climate change. The main strategic document of reference is the Slovak National Adaptation Strategy, adopted by the Government in 2014. Trnava is a signatory of the Covenant of Mayors for Climate and Energy since 2016, with an adaptation target.

Reference Information

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[1] <https://adaptecca.es/en/casos-practicos/social-vulnerability-to-heatwaves-2013-from-assessment-to-implementation-of-adaptation-measures-in-kosice-and-trnava-slovakia>

[2] [https://adaptecca.es/sites/default/files/kosice-trnava\\_figure1.png](https://adaptecca.es/sites/default/files/kosice-trnava_figure1.png)

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