

GREEN-BLUE INFRASTRUCTURE UNDER PRESSURE IN DUMBRĂVIȚA

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Abstract:

Accelerated peri-urbanization in Dumbrăvița has fragmented green-blue infrastructure, reduced public green, increased soil sealing, and intensified flood and heat-island risks. Using spatial analysis, orthophoto interpretation, planning document review, field observation, SWOT analysis, and problem-tree synthesis, this study identifies systemic ecological and urban dysfunctions. The findings support an integrated planning approach in which green-blue infrastructure becomes a structural component of resilient urban development.



Introduction:

- Rapid peri-urban expansion has transformed the landscape of Dumbrăvița.
- Natural assets include Dumbrăvița Lake, drainage canals, and proximity to the Green Forest.
- Lack of integrated planning has weakened ecological connectivity and environmental quality.



Material and methods:

The methodology used spatial analysis, orthophoto interpretation, and planning document review to identify land-use patterns, sealed surfaces, green-blue elements, urban expansion areas, and the role of green-blue infrastructure in local planning strategies.

Field observations verified spatial data and assessed green-blue elements, while SWOT analysis and problem-tree synthesis identified the main vulnerabilities, pressures, causes, and effects of infrastructure fragmentation.

Study area, pressures and vulnerabilities:

This urban analysis highlights the pressures caused by the rapid expansion of Dumbrăvița Commune, emphasizing vulnerabilities related to the lack of green spaces, flood risks, and the urban heat island effect, while underlining the need to integrate green infrastructure for sustainable urban development.

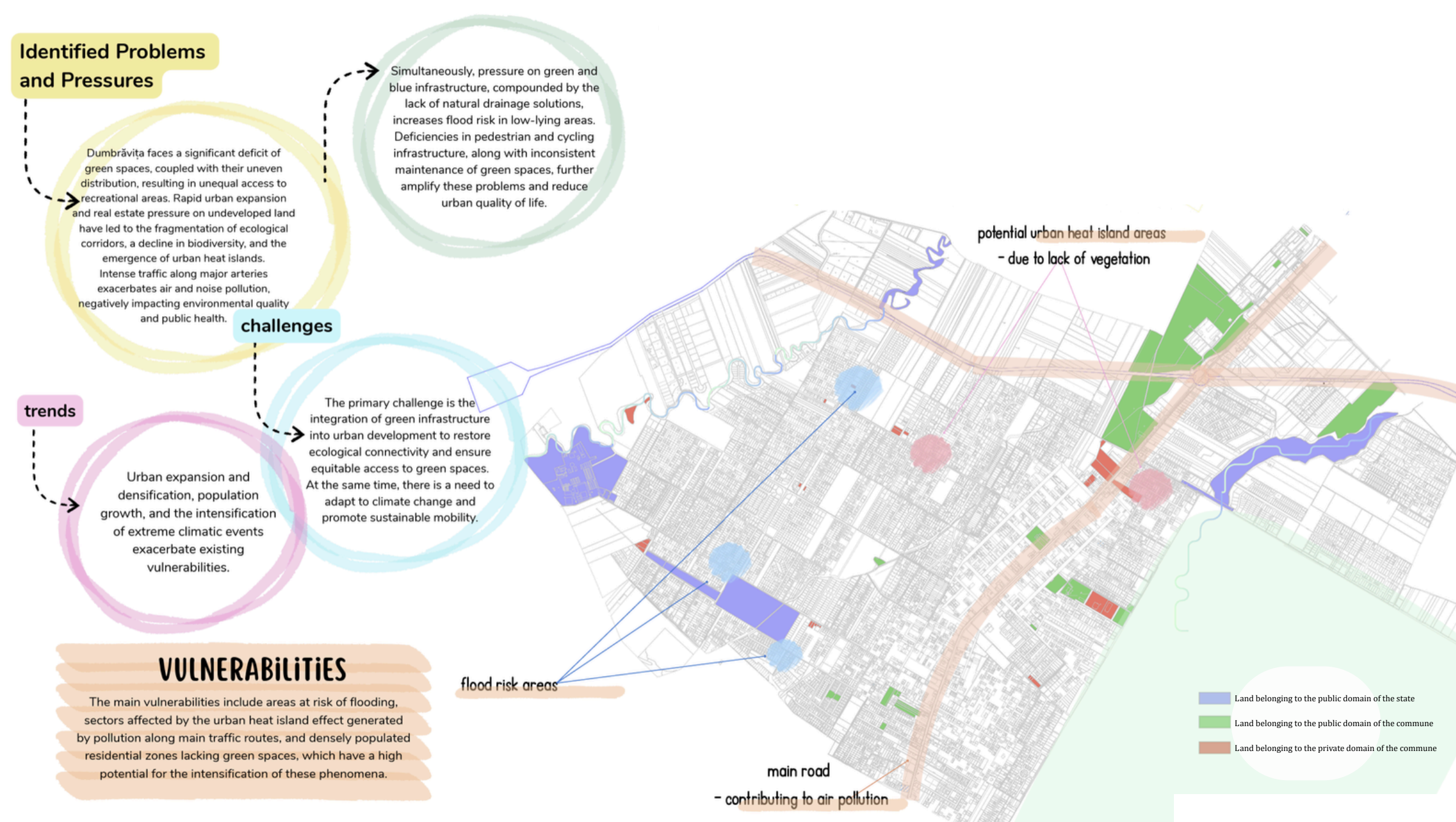


Fig. 3 – Urban pressures and vulnerabilities in Dumbrăvița
 Source: Own work (Anamaria Pop et al.)

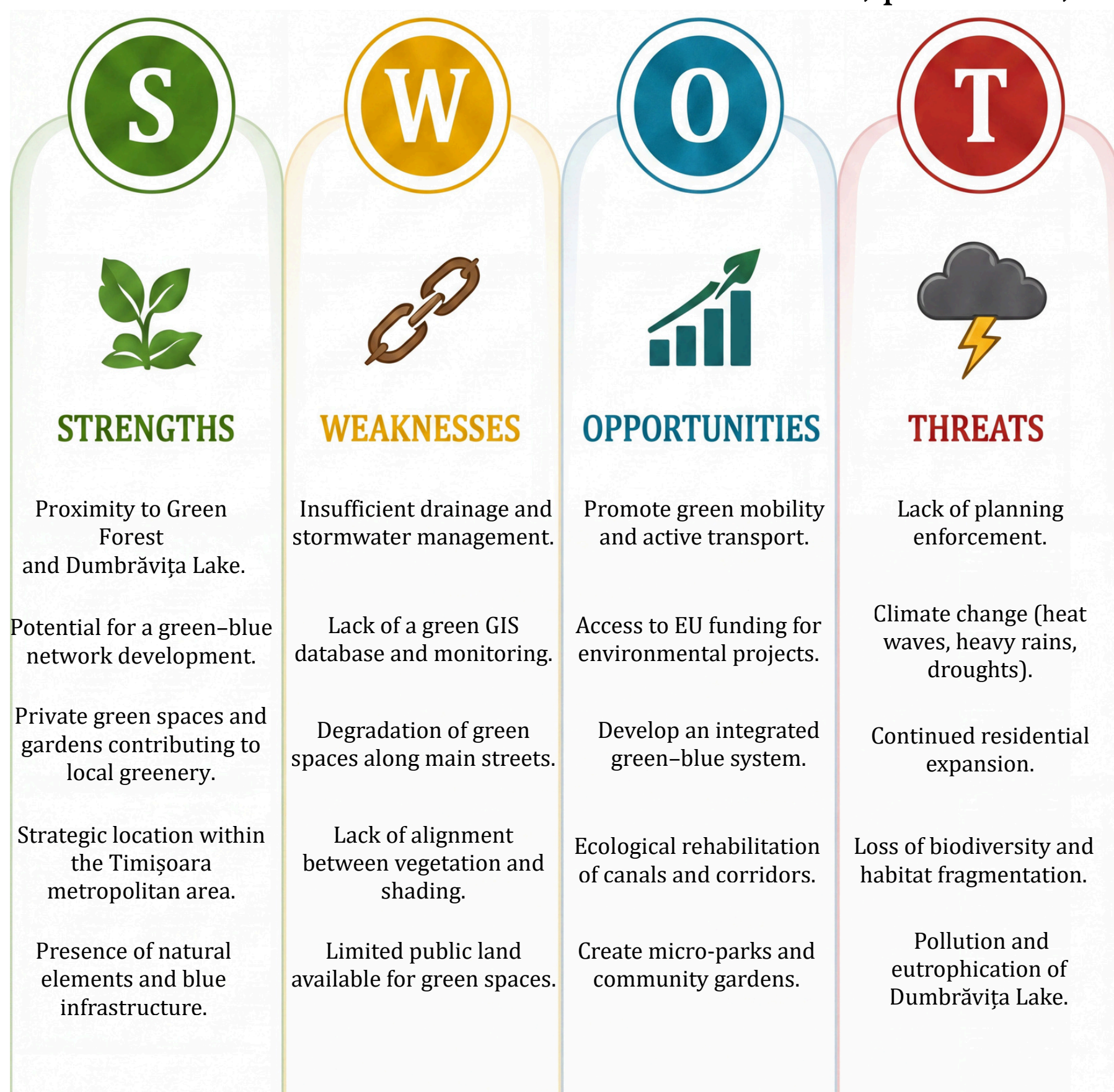


Fig. 1 – SWOT analysis of Dumbrăvița commune
 Source: Own work (Andreea Gheorghe; Andreea Sava).

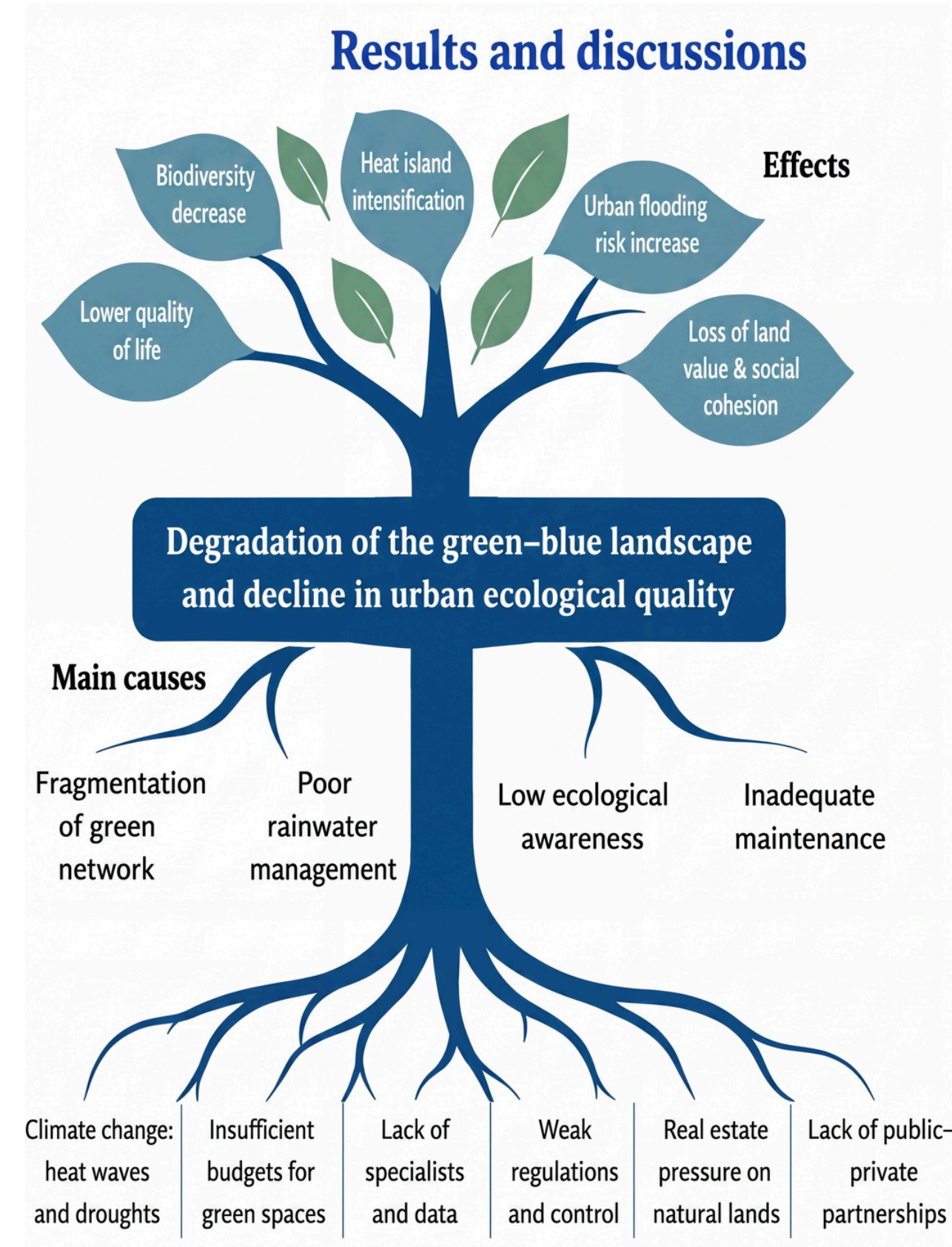
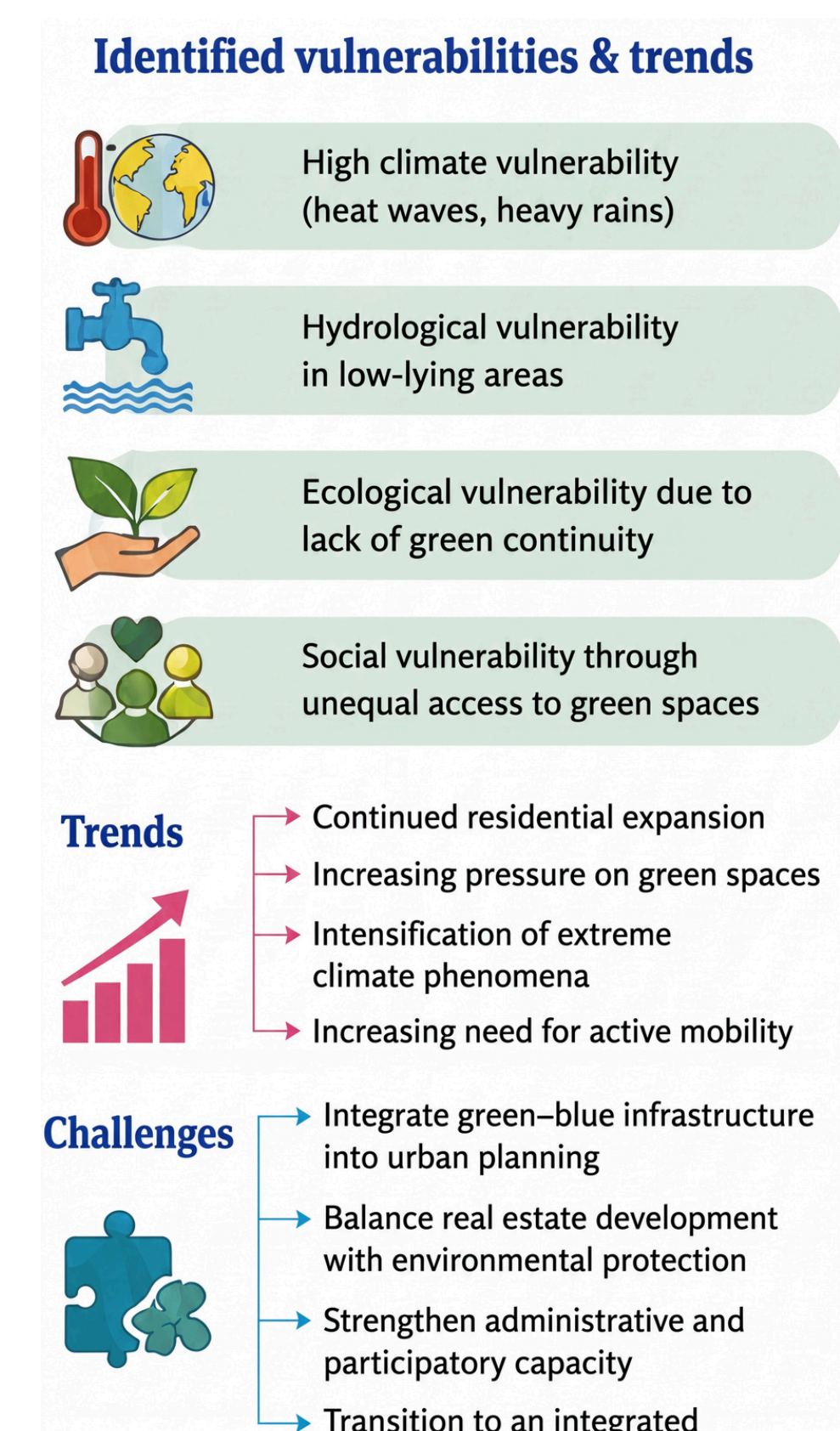


Fig. 2 – Causes and effects of green-blue landscape degradation in Dumbrăvița
 Source: Own work (Indriș Sorana; Alina Duma)



Conclusion:

Public green spaces are insufficient and unevenly distributed, while green and blue elements remain fragmented and poorly connected. Soil sealing and weak stormwater management further increase climate vulnerability. Therefore, the development of an integrated green-blue network, supported by nature-based solutions, is essential for long-term urban resilience.

