The UPSURGE Project Final Conference

Guiding Cities to Deliver Regenerative Urban Transformation

Patras as an upscaling case of UPSURGE innovations

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This project has received funding from the European Union's Horizon 2020 research and innovation program under grant agreement No 101003818

Preamble

Why Nature-Based Solutions Matter for Cities

- **Urban challenge**: climate stress, environmental degradation, social vulnerability
- **Strategic response**: **Nature-Based Solutions (NBS)** as a systemic alternative
- **Core principle**: working *with* nature, not against it
- **Added value**: climate resilience, biodiversity, public health & social cohesion
- **UPSURGE vision**: scaling NBS through co-creation, evidence, and governance innovation

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NBS the goal and the vision

- Restoring our relationship with nature
- Achieve a sustainable future we should work with, not against nature to achieve global goals.
- NBS for Climate Resilience and Adaptation
- NBS a real pathway forward (future).

- Involve directly the protection, restoration or management of a wide range of urban, agricultural, natural and semi-natural ecosystems
- Support & enhance biodiversity in natural and urban areas
- Should be designed, implemented, managed and monitored in partnership with local people and local communities through a process that fully respects local rights and knowledge, and generates local benefits

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UPSURGE project NBS Lighthouse

Concept: Clustering Network, an engagement framework for advocacy, implementation and financing of Nature-Based Solutions (NBS) to tackle air quality and climate neutrality in European Cities.

Goals:

- Promote synergies between private and public sectors for NBS initiatives related to air/environmental quality and climate neutrality;
- Facilitate an online NBS Node for investors, business and local governments;
- Disseminate the Lighthouse consultancy services;
- Attract local governments to join the Lighthouse as clients;
- Attract researchers to join the Clearinghouse as scientific experts.

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Development of Patras' Lighthouse (Starting point spring 2024)

- The development was connected with the selection of a specific application area from which the implementation should be started.
- The selected area of application is the school complex of the 6th EPAL of Patras and the surrounding area (neighborhood).
- The final goal is the installation of Nature Based Solutions (NBS) interventions in the selected school complex

Area selection criteria

The selection due to specific criteria:

- it is a controlled community, school buildings are under the administration of the municipalities,
- Municipality of Patras has a close and long-standing cooperation with the school community in issues of environmental education.
- it is a numerous community since five school units are co-located, school building is quite big, so any nature-based intervention will have a significant footprint
- and finally the complex is located in an area of particular environmental interest (adjacent to an urban forest and on the other side to a busy traffic junction, this city area is highly urbanized and densely populated.

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The area of interest (pilot area)

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Methodology for NBS selection

The goal was to create, through a participatory process, a pool of potential NBS solutions that would be perfectly adapted to the 6th EPAL.

Co-creation procedure

Having the experience of the workshop, the knowledge of the needs of the school community and the financial margin given to us by the project budget, a consultation process was initiated with the municipality's geotechnical employees (agronomists and foresters) as well as with the experts participating in the UPSURGE Patras Lighthouse board.

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Specific goals set

During this process, the following specific goals were set with the implementation of the NBS in pilot site.

- Increasing the shading of school open spaces (courtyard)
- Selection of suitable Mediterranean plants (trees and shrubs) that will absorb effectively quantities of greenhouse gases and will be resilient to summer drought
- Solutions which limit the thermal load of the building due to the urban heat island effect
- Overall solutions that can be showcased and demonstrated to other schools and communities

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Potential NBS solutions considered

- The installation of a plant-based sound barrier along the school complex's fence bordering the expressway.
- The installation of a green roof on part of the building's terrace
- The installation of wooden gazebos in 3-4 spots in the courtyard, where students will find shelter during heat days lesson breaks
- The replacement of the basketball / volleyball court floor with a high water permeability material, that absorbs rainwater, facilitates its natural runoff into the ground, with simultaneous collection of rain water through a network of underground pipes and storage in a water tank for irrigation during the dry months.
- Creation of a small demonstration botanical garden with plant species suitable for addressing the impacts of Climate Change
- Installation of Green walls (vertical greenery systems or vertical gardens)

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NBS solutions selected to be installed

- Green roof on part of the building's terrace
- Green walls (vertical greenery systems or vertical gardens)

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Green roof installation

- Creation of a 150 m2 green roof on the school building, which is the central intervention in the overall design.
- Provided that the load-bearing structure and the static adequacy of the building allow it, the installation of a visitable roof garden can function both as a green infrastructure that improves the microclimate and reduces the energy consumption of the building, and as a modern educational space.
- Vegetables and aromatic plants can be grown there, creating an “educational vegetable garden” that will be linked to the experiential learning and environmental education of the students.
- In this way, the rooftop garden will not only serve as an aesthetic and ecological upgrade, but also as a sustainability laboratory, where students will have the opportunity to cultivate, experiment and understand in practice the value of the circular economy and sustainable development.

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Green roof installation

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Green walls installation

- Green walls (vertical garden)
- Installing 30 m2 of vertical garden in a school can offer multiple benefits, both environmental and educational.
- A green wall helps reduce the temperature around the building, reduces noise pollution and improves air quality by trapping dust and microparticles.
- At the same time, it acts as a living example of biodiversity, as it can host different types of plants, even pollinators.
- For students, such a space is an opportunity for experiential learning as they can participate in the care of plants, study ecological relationships and understand in practice the value of green infrastructure in cities.
- In addition, the vertical garden aesthetically improves the school environment, creating a more pleasant and healthy space for daily activity.

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Green walls installation

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Expected benefits

- Climate Adaptation & Heat Island Mitigation
- Water Management & Flood Risk Reduction
- Biodiversity & Ecosystem Restoration
- Air Quality & Environmental Health
- Social, Aesthetic & Well-Being Benefits

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Opportunities and Challenges of Applying Nature-Based Solutions in Patras

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Nature-Based Solutions in Patras

- **Urban challenges**: heat, flooding, social inequality
- **Framework**: EU **UPSURGE (2021–2025)**
- **Pilot area**: Agia Sophia (vulnerable neighborhood)
- **NBS actions**: trees, community gardens, permeable surfaces
- **Added value**: climate resilience + social cohesion

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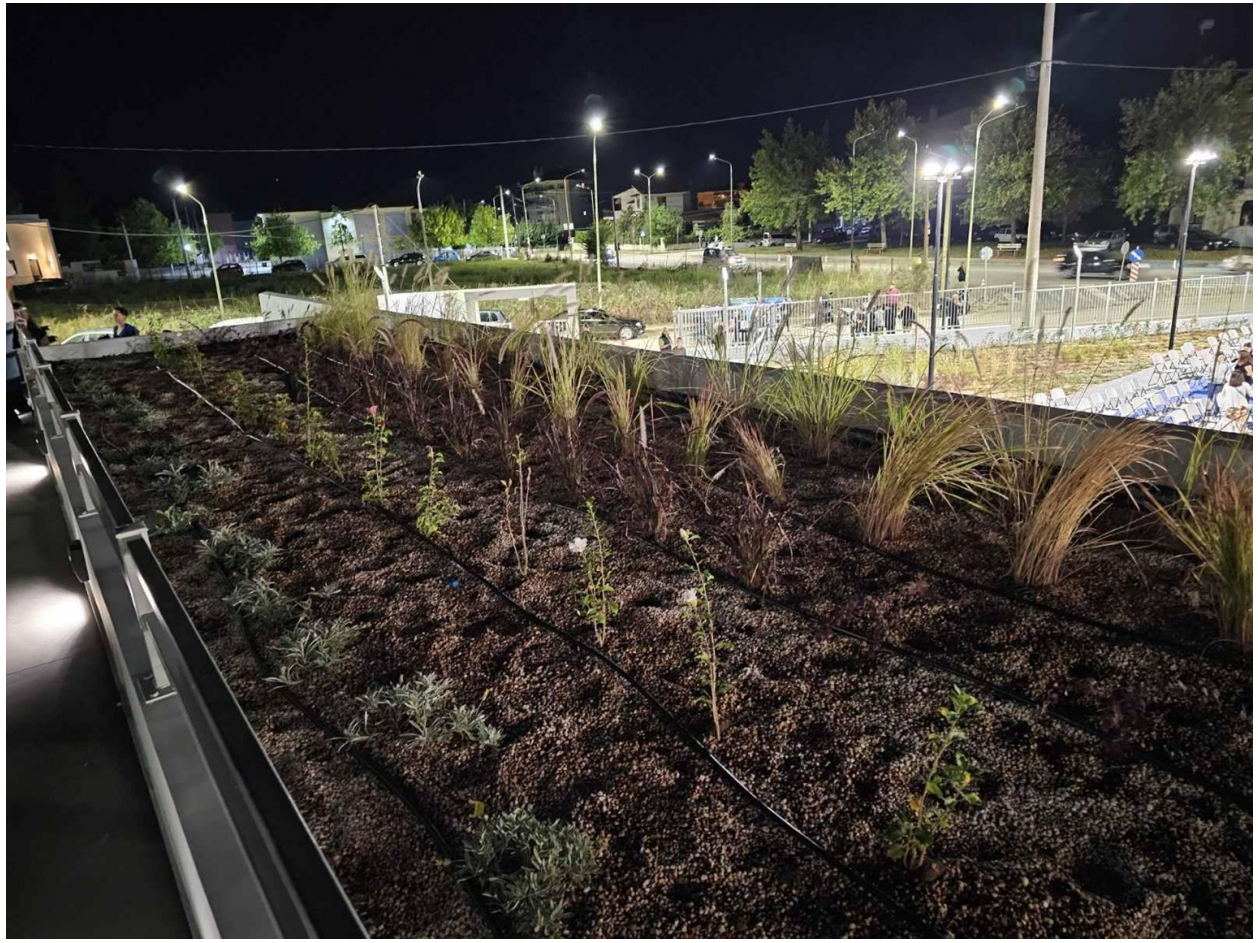
From Pilot to Mainstreaming

- **Key barriers**: fragmented governance, limited funding, low awareness
- **Structural bias**: preference for grey infrastructure
- **What is needed**:
- Integrated governance
- Sustainable financing
- Evidence-based advocacy
- **Take-home message**:
NBS can become a transformative urban tool when embedded in local policy and community practice.



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Future Goal

- to spread the concept of NBS to other authorities and spaces in the city of Patras starting with the schools
- to integrate and adopt NBS in the green studies, environmental works interventions and green infrastructures of Municipality of Patras
- to share with neighboring municipalities and regions our experience and acquired Knowledge in NBS in order to improve the urban environment and the quality of life

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A School Transformed: The Multifaceted Impact of Nature-Based Solutions in Central Patras

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A School as a Living Laboratory (Patras, Greece)

- **Framework**: EU **UPSURGE** project
- **Interventions**: NBS + photovoltaic unit
- **Function**: climate adaptation, education, energy transition
- **Outcome**: students as active co-creators

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From Schoolyard to City

- **Benefits**: cooling, flood reduction, social cohesion
- **Value**: visible proof of “living” solutions
- **Impact**: shifts attitudes from grey to green infrastructure
- **Take-home message**: *Small-scale NBS can drive large-scale urban resilience.*

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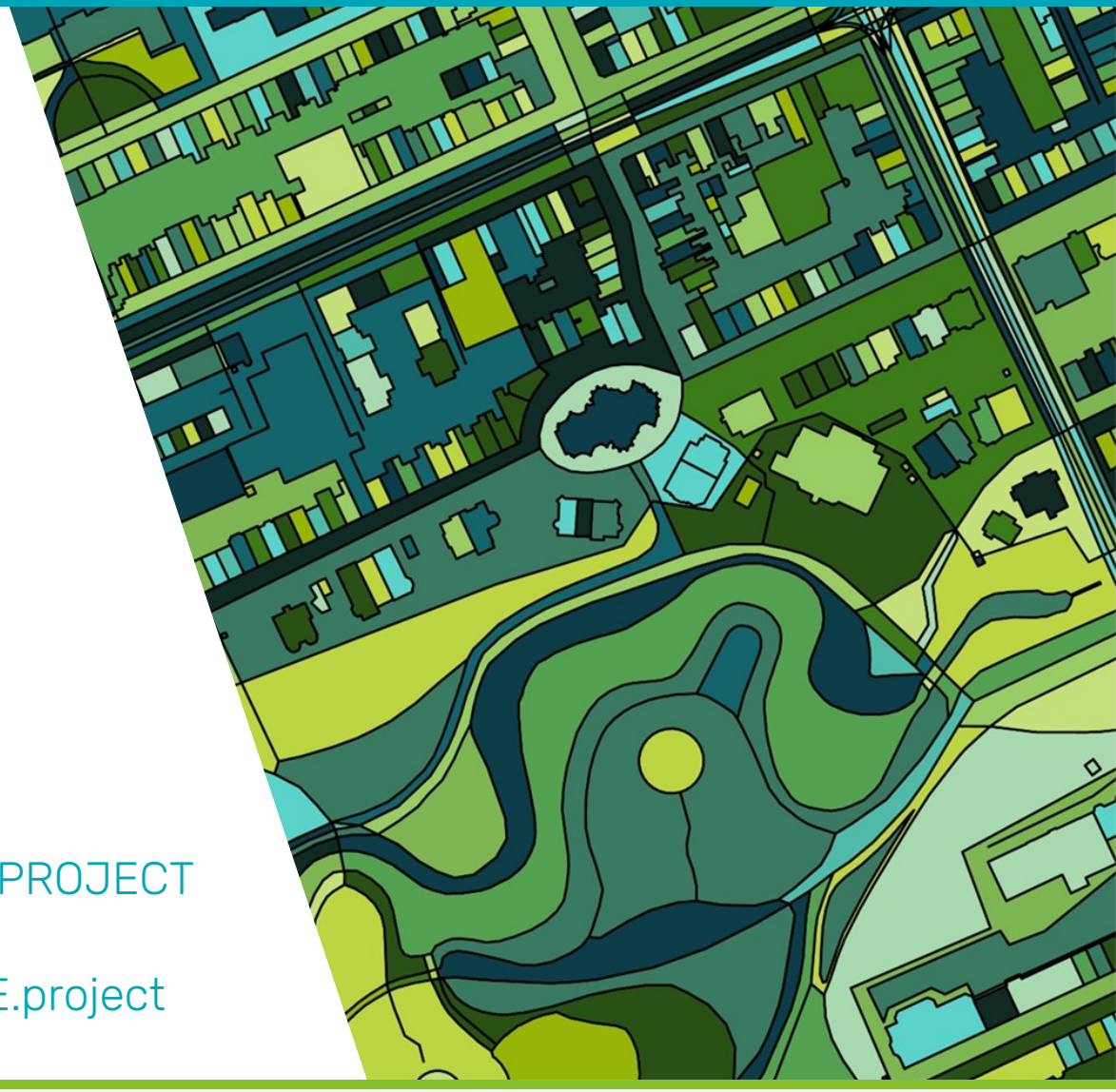
City-centered approach to catalyze nature-based solutions through the EU Regenerative Urban Lighthouse for pollution alleviation and regenerative development

UPSURGE



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