

Abstract

Climate change and urbanisation contribute to urban water issues that have an impact on long-term sustainability and climate resilience. Nature-based Solutions (NbS) and Blue-Green Systems (BGS) mitigate the impact of extreme events, reduce pollution, enhance biodiversity and support water circularity through closed-loop water reuse measures aimed at maintaining adequate quantities of good quality water. Despite the benefits, several knowledge gaps impede implementation and long-term sustainability. This includes institutional resistance, lack of financial instruments, restrictive design regulations, uncertain operational performance (multifunctionality), limited stakeholder engagement and poor maintenance/monitoring functions.

This project will explore NbS-related challenges with the purpose of optimising the reuse of water and creating a sustainable water management approach that integrates surface drainage systems into existing urban planning strategies. The main objective of this project is to support the scientific framework for the successful deployment of water circularity principles by combining/upscaling NbS in the urban environment and facilitate wider implementation.

An interdisciplinary consortium of 5 universities from 5 European countries will execute 6 work packages. Each university maintains its own research infrastructure/technologies in the form of Urban Living Labs that will be used to conduct scientific analyses in support of a systematic, evidence-based approach to acquire scientific knowledge. Partners will monitor and collect data on the long-term performance of Urban Living Labs under simulated conditions of limited urban space and varying seasonal influences. Each system's performance will be monitored and assessed for risks, efficiency, durability and changes in physical, chemical and biological parameters which also impact on environmental aspects.

The goal is to advance water circularity through technologies and new frameworks that improve water quality, enhance infiltration, promote reuse of runoff, reduce reliance on conventional sources and strengthen urban resilience. Research activities will produce a comprehensive database demonstrating the reliability of NbS (to promote acceptance) and insights to guide future design, construction and maintenance practices that enhance the urban water cycle. The data will be used to develop models aimed at upscaling NbS from local to sub-catchment level, thereby supporting the building of resilient urban infrastructure worldwide. Stakeholder participation will be stimulated using interactive visualization tools (augmented reality) and initiatives for capacity building (ClimateCafé). The open-source knowledge sharing platform (ClimateScan.org) will facilitate stakeholder participation in planning and decision-making processes. The existing methods of ClimateCafé and ClimateScan platforms (with thousands international contributors) will be used rather than setting up new platforms for dissemination of Urban Living Lab activities and publishing results, following FAIR principles. Socio-economic aspects will be assessed to identify drivers/barriers for implementation. Guidelines, models, fact sheets and regulatory frameworks, developed throughout each work package, will facilitate the integration of circularity methodologies into existing water management frameworks while addressing economic and social concerns. This work also focuses on disseminating knowledge and connecting to relevant projects through channels such as social media and peerreviewed publications. Knowledge shared between partners, different platforms and project initiatives will encourage international cooperation in the water field. As such, several topics defined by the call are addressed, while strong focus on managing and monitoring project progress and deliverables are maintained. Finally, the project aims to deliver technical solutions that meet stakeholder needs and provide tangible results.

KEYWORDS



► Project coordinator

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► Project partners

- GDANSK UNIVERSITY OF TECHNOLOGY - POLAND
- VIA UNIVERSITY COLLEGE - DENMARK
- RIGA TECHNICAL UNIVERSITY - LATVIA
- UNIVERSIDADE DE COIMBRA - PORTUGAL

► Funding organisations

NWO (NETHERLANDS) / NCBR (POLAND) / IFD (DENMARK) / LCS (LATVIA) / FCT (PORTUGAL)

► Duration

3 years

► Contact

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nature-based solutions,
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stakeholder engagement,
urban planning