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Nature-based solutions (NBS): The Connecting Nature project

The Connecting Nature project is funded by the Horizon 2020 programme: Smart and Sustainable Cities H2020-SCC-2016-2017. It uses nature-based solutions, which derive from recognizing the value of the analogy between natural processes and spatial planning. Nature-based solutions are created by comprehensive, joint design and creation processes that lead to more ecological, environmental, and social benefits. The concept has evolved from addressing questions and challenges such as the following: How can nature help the city? How can we design a space that will simultaneously provide more benefits? Examples of NBS solutions for the well-being of cities are diverse. For example, they may create elements of green infrastructure which, in addition to microclimate effects, also have the role of linking parts of cities and contributing to sustainable commuting and/or recreation. NBS solutions provide biodiversity and ecological benefits and can combine various positive effects, including energy production, sustainable waste management, promotion of social integration, public-health oriented green area planning, and so on.

Although the benefits of NBS have been recognized, the development and implementation of nature-based solutions is complex and often difficult and rather slow in practice. Implementation of NBS concepts is currently a challenge for most cities at the level of

the decision-making process. Solutions require the efforts and contributions of various disciplines, because they address a number of environmental, social, and economic challenges of the society in a sustainable way. When planning solutions, planners or decision-makers often face “silo thinking”: departmentalizing and compartmentalizing tasks to the extent that there is little cross-communication or cross-fertilization of ideas and solutions. The Connecting Nature project addresses the question of how to effectively integrate nature-based solutions into planning and decision-making processes.

The project includes thirty-one organizations that work together with authorities, communities, industrial partners, NGOs and experts from various fields. The partnership of sixteen European countries, Brazil, China, Korea, and the Caucasus (Georgia and Armenia) invested in a multi-million-euro, large-scale implementation of nature-based projects. The project evaluates the impact of initiatives and NBS solutions for partner cities in terms of adapting to climate change, human health and well-being, social integration, and sustainable economic development. The overarching objective of Connecting Nature is to position Europe as a global leader in the innovation and implementation of NBS in urban and social development. A knowledge framework and a database of nature-based solutions is



being created through the partner cities' cooperation. Evaluating these solutions, innovations, and syntheses of different approaches and methodologies triggers a new learning process that will help other cities around the world to implement NBS in urban space.

The “front-runner” cities play an important role in the project, because they have already implemented the NBS concept in practice. They are actively working at the trans-disciplinary level, they use bottom-up planning, and they have an open and creative dialogue with different stakeholders. The front-runner cities of Genk, Glasgow, and Poznan represent examples to other “follower” cities (two groups of follower cities have formed: fast followers and multiplier cities). These cities are using participatory co-creation, cross-sectoral cooperation, and advanced technological solutions to plan and manage spatial solutions. In the project, the front-runner cities' NBS solutions are examined in detail, in order to formulate and define indicators for evaluating NBS solutions and to study, evaluate, and understand the planning processes and establish successful models of NBS financial mechanisms. The project envisages the

development of a mechanism for monitoring and evaluating the effectiveness of the implementation of NBS solutions using impact indicators (climate change adaptation and resilience, health and wellbeing, social cohesion, economic development potential, and green business opportunities) and assessment criteria (cost effectiveness, inclusivity, policy-embeddedness, and stakeholder endorsement). This mechanism will be based on the already implemented NBS solutions of front-runner cities and will be used to measure progress towards the set goals at different stages of the NBS solutions.

The front-runner cities are dealing with several different challenges in the various stages of development. To illustrate, Genk is actively involved in the project, by planning and implementing the Schansbroek project in the Stiemerbeek valley, with focused transparent insights into the process of planning and evaluating the project solutions. The area has a distinctive industrial character and exceptional cultural diversity in the population. The urbanized part of the valley contributes to water pollution, makes it more difficult to regulate the level of groundwater, and consequently is harming the biodiversity of the area. Therefore, the regeneration of the water system in the form of renaturation is a key step and challenge. A nature-based solution envisages a linear design of a multi-functional park along a water channel. In the rainy months, the area represents a protective flood buffer for the settlement, whereas in the dry period, the design elements of green and blue infrastructure offer recreation space. The area is ecologically important, so the renaturation will improve biodiversity and spatial degradation. Due to its very complex technological solutions, the Genk project will be able to search for innovative participative financing models based on Connecting Nature. In the social aspect, the nature-based solution of the Stiemerbeek



Figure 1: Water channel in the Schansbroek area (source: project homepage).

park represents a reference to other projects, because it incorporates the aspect of recreation into its design, promotes the concept of sustainable mobility, provides biodiversity, and represents an example of stakeholder involvement in the creation of a public space. It represents a way to use the diversity of the population, despite the cultural barriers, as a mean of co-creating, integrating, and ensuring social cohesion.

NBS solutions are not limited only to larger multi-functional areas. Genk is also involved in Connecting Nature with the project “Beeplan”, which provides a bee-friendly city with a network of relevant bee spaces. The project involves a network of different stakeholders, which represent an example of how project develops from the initiatives and participation of individuals to effective management. Glasgow, for example, is implementing a “Stalled Spaces” project. Given the fact that a lot of the city’s land is polluted, the costs of remediation of such degraded land increase the costs of constructing buildings or land consolidation. Thus, they are seeking solutions with temporary land use, which contribute to the nature-based solutions if they help improve the environment. The project allows residents to use land for temporary purposes, which brings benefits to communities and is a rational use of space. The community creates space according to the neighbourhood needs, taking into account the characteristics of the degraded land. According to this concept, Glasgow’s local inhabitants have taken over 100 areas where various temporary uses are taking place, such as gardening in raised

beds, urban gymnasiums, playgrounds, and artistic activities.

The Connecting Nature project in the city of Poznan addresses the effects of climate change, especially heatwaves and floods. The densely populated urban centre has impermeable urbanized floors, which limit the ability to retain moisture in dry months, creating inappropriate microclimate conditions in the city. When there is intense precipitation, the population faces floods due to poor water drainage, which has a negative impact on the quality of life itself. To improve conditions in the city, pocket parks are being planned on the abandoned, unused, and degraded areas within residential areas. These parks will connect the city with green corridors, improve microclimate conditions, provide recreation and social opportunities, and the permeable soils will relieve the rainwater burden on the drainage infrastructure.

Front-runner cities in the project are followed by partner cities looking for knowledge and experience with nature-based solutions. The Connecting Nature project aims to transfer knowl-



Figure 2: Temporary use in Glasgow (source: project homepage).



Figure 3: Pocket parks (source: project homepage).

edge from different areas and stages of the solutions.

The co-creation of spatial solutions is one of the important aspects of the NBS concept. The current activities of the Urban Planning Institute of the Republic of Slovenia (UIRS) are focused on understanding the process of co-creating open spaces, the importance of involving different stakeholders, and the advantages and disadvantages of co-creating space with users according to different stages of integration. In order to capture a comprehensive overview, in the next phases, emphasis will be placed on examining the role of government bodies and planners in the process of planning, focusing on questions of managing and coordinating the planning process, and the importance of integrated planning and various ways to participate. The UIRS developed a generative GIS web platform as a set of tools that assist the implementation of public participation in urban planning processes. The Connecting Nature project and front-runner cities will test stakeholders' interests (users, planners, state bodies) in using GIS participatory tools, what kind of results can be achieved, and how the tools can be useful in the individual phases of the process (planning, implementation,

management, and monitoring). The research also focuses on these questions: How are the roles in co-creating NBS solutions taken: who moderates and leads the process? When is the process of co-creation finished? How should we measure the success or failure of NBS solutions? In addition to the questions of the integration and optimization of public participation, the UIRS's activities are also linked to the development and verification of social criteria and indicators in the process of urban planning and development involving NBS solutions. Our contribution is visible through the development of the concept of space-carrying capacity for implementing solutions in terms of space usage and sustainable use of natural resources.

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Project information and sources

Project homepage: <https://connecting-nature.eu>