

# Key principles for successful NbS planning

Nature-based solutions (NbS) have revolutionized urban planning, offering multifunctional approaches that go beyond aesthetics and which can address climate change, enhance livability, and achieve sustainable and resilient urban environments. After five years of exploration, experimentation, and reflection in the CLEVER Cities project, we have identified key principles for effective NbS planning. These principles will guide informed decision-making and help to unlock the potential of NbS in interested cities.

## Key principles

### **Multiscale thinking**

Traditional urban planning sometimes neglects the crucial aspects of territorial planning and geography. However, when incorporating NbS, this comprehensive approach becomes essential. The integration of NbS with existing natural spaces both within and outside the city is vital for effective planning. It is thus advisable to initiate projects by defining NbS specifications on a macro-scale, considering the larger context. Conversely, the functionality of NbS relies heavily on the intricacies of design and implementation. Paying attention to micro-scale details such as plant species, their sizes, substrate thickness, and filtration systems becomes paramount when designing and sizing urban interventions. These nuanced factors significantly contribute to the success of NbS implementations.

### **Cross planning integrating natural and urban dimensions**

The intricate functioning of ecosystems - compounded by the interactions between urban and natural environments - requires the expertise of specialists who can unravel their intricate mechanisms. By incorporating this understanding, we can effectively build on the principles of 'traditional' urban planning. An intriguing approach involves utilizing existing ecosystems or envisioning potential ecosystems as a foundation for planning, subsequently developing projects centered around the ecosystem services that can be harnessed from the local environment.

### **Social dimension and cooperation between stakeholders**

The IUCN standard for NbS emphasizes the crucial involvement of local stakeholders in the planning process. Specifically, attention must be given to the site users and individuals with direct engagement in the urban project. CLEVER Cities has had a rewarding experience in this aspect, implementing diverse co-creation techniques that have effectively added a valuable social dimension to local projects. These participatory processes are particularly significant in NbS planning, as they empower local stakeholders to take ownership of the solutions, contributing to the long-term success of the initiatives.

### **Living solution**

A fundamental aspect of incorporating NbS into urban projects is their dynamic and living nature. It is crucial to consider the temporal dynamics associated with these solutions, including seasonality, installation time of plants, and long-term evolution, to fully leverage their capacity to provide ecosystem services. This analysis needs to be balanced with urban functional requirements while anticipating maintenance needs. Additionally,

monitoring the implemented solutions is valuable for generating local collective learning based on factual data, facilitating a "learn by doing" approach.

### **Integrating existing ecosystems**

NbS planning offers the opportunity to integrate existing natural remnants that are little known or disconnected, whether from the rest of the neighboring natural environment or from the city itself. Working on these connections often proves to be highly effective and a source of multiplier effects in terms of the environmental and social impacts generated.

## Experiences from CLEVER Cities

### **Experience in Madrid (Luis Tejero Encina, Ayuntamiento de Madrid)**

1. Feedback from CLEVER cities, what did you learn during the project about integrating NBS in an urban planning project?

*The integration of nature-based solutions in urban plans means the reintroduction of nature in the city, providing more sustainable alternatives to current and future problems, but it should not stop there and should mean the push towards more integrative and sustainable urban planning. its construction through collaborative and plural processes*

*Based on the experience of the city of Madrid in the CLEVER CITIES project, we have come to the conclusion of the convenience of not talking about isolated NBS plans but rather integrating the solutions and philosophy that nature implies in a transversal way in the different sectoral plans and bring about their confluence. Urban planning must include mobility, climate change policies, the economic perspective, among others, and the NBS must act as an instrument for its implementation.*

*The innovative concept of the SBN has made it possible to gather around it a set of knowledge and disciplines that in many cases act in isolation and give the necessary prominence to citizens.*

2. What is essential to consider for an urban planning project with NBS? Do the 5 key principles mentioned correspond to your experience? Are any missing?

*The essence of urban planning through NBS is the transformation of current models of its construction, and the key concept is integration. The integration of different perspectives and actors, of generations and knowledge, of different spatial and temporal scales, of different urban systems or of environmental, social and economic objectives.*

*The 5 principles mentioned are those that must direct NBS plans, the roots from which the branches that structure the construction of a plan must grow. It is worth highlighting the development of administrative and governance structures that allow co-creation, the body of technical solutions and evaluation systems that define the solutions, the management models that allow the plans to evolve.*

3. Can you give an example of the two key principles that apply best in your experience?

*During the experience developed in Madrid, the involvement and joint work of the various municipal departments has been crucial, it has established a work precedent that is being tried to replicate in other municipal initiatives.*

*The involvement of local communities in the project has also been key, which have pushed the process to to its execution phase.*

**Experience in Quito (Grace Yépez, YES Innovation)**



**Figure 1.** Actual (left) and prospective (right) view of the San Enrique de Velasco Neighbourhood, pilot district for CLEVER Cities in Quito (Credit: YES Innovation)

1. Feedback from CLEVER cities, what did you learn during the project about integrating NBS in an urban planning project?

*In the case of Quito, it was particularly important to consider the prospects for the evolution of the city and the exposure to risks that this evolution entails. We did this work at the neighbourhood scale to invite the community to consider in its neighbourhood evolution not only solutions that seek to formalise the neighbourhood (paving, traditional facilities), but also techniques that bring greater resilience and quality of life to the neighbourhood in the future, such as the NBS. In this sense, it was important to plan at the macro-scale before designing individual solutions. Then, considering the lack of awareness of the services that green infrastructure can provide to the city, it was essential to disseminate technical information on the potential of BNS beyond the ornamental, focusing on water management, urban heat management, biodiversity preservation and health.*

2. What is essential to consider for an urban planning project with NBS? Do the 5 key principles mentioned correspond to your experience? Are any missing?

*In Quito we focused on the social and cooperative dimension, seeking to experiment and learn about co-creation processes, which was one of the key themes of CLEVER. This allowed us to understand the*

*great interest that exists among municipal entities in resilience and sustainability solutions for the city, such as the NBS, as well as the great difficulties in grounding these concepts in the reality of projects and urban intervention. We have sought to work on these difficulties, trying to "generate experience", even on a small scale, to encourage exchange and continuous improvement.*

3. Can you give an example of the two key principles that apply best in your experience?

*The first is the integration of existing ecosystems. The city of Quito is criss-crossed by numerous streams that are extremely interesting ecosystems because of their still somewhat preserved naturalness, but which suffer from rejection by urban development and by the citizens themselves. Our pilot neighbourhood of San Enrique de Velasco is surrounded by two large streams, which the recent history of the neighbourhood has left out of the development of the neighbourhood. These two streams can provide very important services to the neighbourhood and we have been working with the community on solutions to re-establish functional connections between the neighbourhood and its streams. We hope that this can be realised in the short term.*

*The second principle that has been key to the work in Quito has been to plan with biologists who can guide us in species selection, ecosystem shaping or reinforcement and successful vegetation establishment processes considering BNS implementation sites. Working in a cross-cutting manner between city experts and nature experts strongly enhances efforts to ensure that BNS can provide ecosystem services.*