

SCC2 project perspective

Role of Technology in Supporting NBS Market Development

Digitalisation & technological innovation provide unique opportunities:

- Engage a wide range of stakeholders in collaborative actions
- Understand the effectiveness of implemented NBS
- Enable evidence-based decision-making
- Provide evidence of achieved benefits to support NBS replication, upscaling, financing & business development/ commercialisation of technologies



Collaboratively identify Challenges & Ideate NBS



Digital technologies can support:

- Increased awareness of challenges & potential solutions
- Collaborative ideation & design of NBS
- Gathering of stakeholder feedback

The [UNaLab Open Nature Innovation Arena](#) engages users in online brainstorming, from identification of challenges to development of ideas & understanding how NBS have been employed to address similar issues elsewhere

PROBLEMS CHALLENGES IDEAS NBS

Ideation... ...refinement... ...submission!

Quality of life

Make the Frederiklaan attractive!

Submitted by AdminEindhoven

Inactive

| Start Date | End Date |
|------------|------------|
| 23/11/2020 | 25/11/2020 |

★★★★☆

The Frederiklaan has become a completely asphalted, tiled street, leading to dangerous, noisy, hot and unhealthy situations. As we are renovating we have the opportunity to redesign the street and make it attractive to everybody using it: car, bikes, pedestrians, children playing, and elderly

Proposed Ideas : 8

Quality of life

Community garden

Submitted by Nick Braven

Wellbeing, Welfare

Creation Date 25/11/2020

Ratings ☆☆☆☆☆

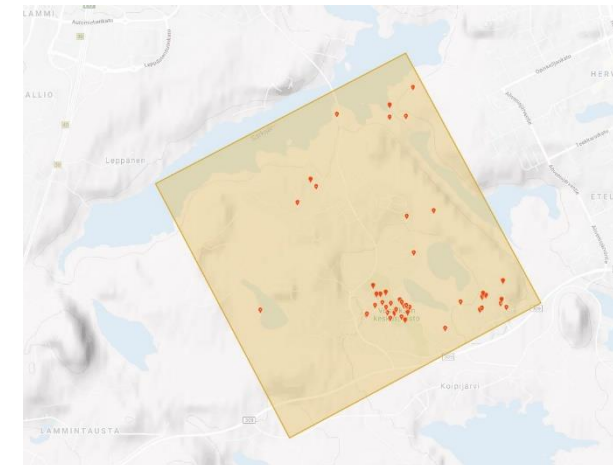
AdminEindhoven

From Zsuzsanna: Create small community garden spots maintained by the residents

Associated to Challenge Make the Frederiklaan attractive!

Engage stakeholders in collaborative monitoring

- Digital platforms & services to collaboratively gather & share information
- For example, citizens in Tampere (FI) are using the [iNaturalist app](#) to document observations of pollinator species
 - Part of the international iNaturalist network (www.inaturalist.org)
- During summer months of 2020 & 2021, local citizens recorded 145 observations of 74 different species within UNaLab demo areas
- Observations recorded by day and time, and location
- Citizen's observations augment scientific surveys
 - Pollinator species presence
 - Shannon Diversity Index
 - Citizens in Tampere are using iNaturalist to document pollinators, arthropods and *Heteroptera* species



Understand NBS Effectiveness



- NBS can support high-level objectives related to climate change adaptation & mitigation, ecosystem & biodiversity conservation & restoration, sustainable development, etc.
- At present, widespread adoption of NBS & their incorporation within multi-level policy instruments is hindered by fragmented & largely discipline-specific nature of existing evidence of NBS performance & impact
- Evaluating the impacts of NBS provides evidence of their effectiveness
 - Monitoring – sensors, surveys, data platforms & visualization tools
 - Modelling – based on existing data, estimate impacts of proposed or implemented NBS

Tools & technologies that support understanding of NBS effectiveness include:

- Satellite imagery
- Sensor data
- Artificial Intelligence (AI) and/or Machine Learning (ML) applications
- Market based digital incentives that provide a pathway for greater adoption of NBS
- Digital platforms
- Digital tools to automate NBS data aggregation, visualisation, & advanced analytics

NBS Evaluation - Integrated Assessment Framework

- Collaboration between **17 EU-funded projects and related programmes** to develop [*Evaluating the Impact of Nature-based Solutions: A Handbook for Practitioners*](#) & [*Appendix of Methods*](#), + [*Summary for Policymakers*](#)
- Guides users through the process of collaboratively establishing and carrying out NBS impact evaluation

The [*Handbook*](#) serves as a guide to development and implementation of scientifically-valid monitoring and evaluation plans for the evaluation of NBS impacts

The [*Appendix of Methods*](#) provides a brief description of each method, along with guidance about the appropriateness, advantages and drawbacks of each in different contexts

Framework of indicators and methods for assessing the performance and impact of diverse types of NBS across 12 challenge areas:

- A reference for relevant EU policies and activities
- Orients practitioners in developing robust impact evaluation frameworks for NBS at different scales
- Comprehensive set of 446 indicators and methodologies
- Key points highlighted in [*Summary for Policymakers*](#)

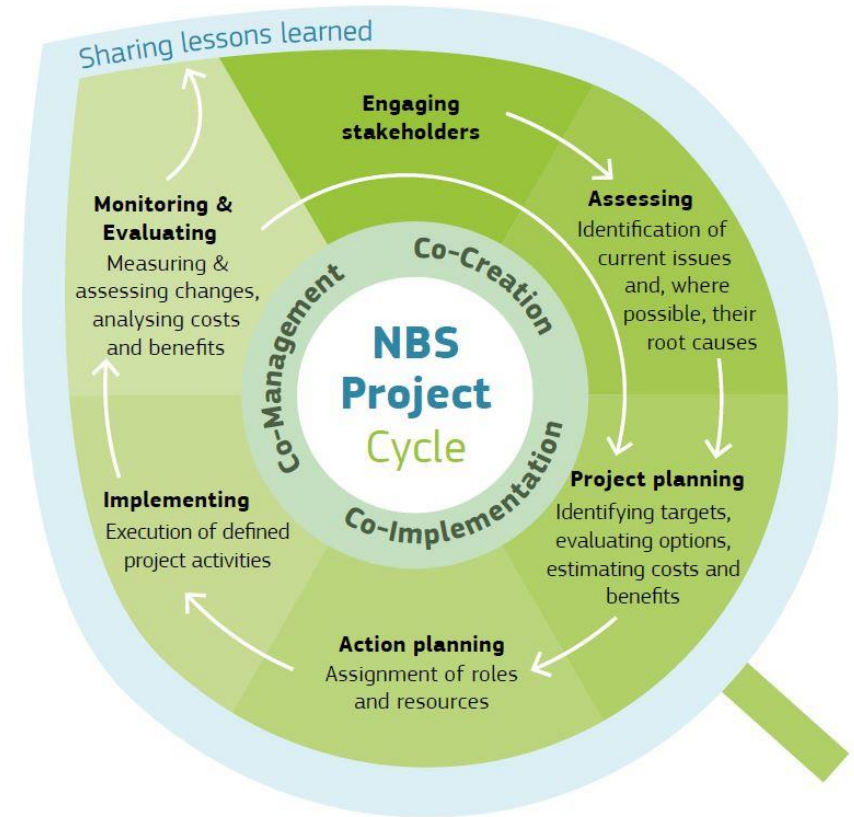


Image source: Sgrigna et al. 2021. Chapter 1, [*Evaluating the Impact of Nature-based Solutions: A Handbook for Practitioners*](#)

Example: City Performance Monitor



ABOUT THE CITY ABOUT THE INDICATORS

Eindhoven challenges



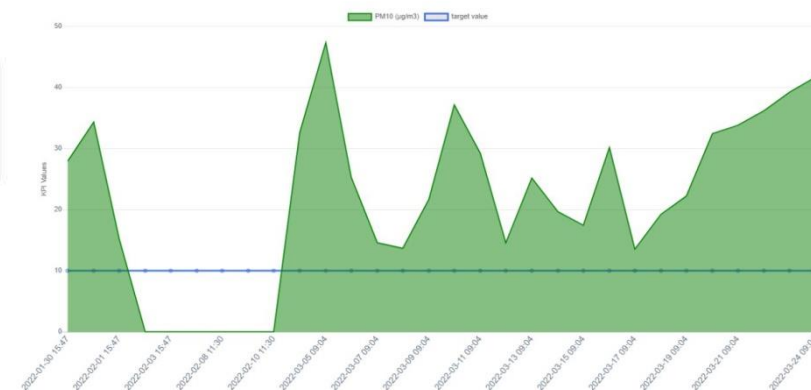
Eindhoven nature-based solutions



PM₁₀ (µg/m³)

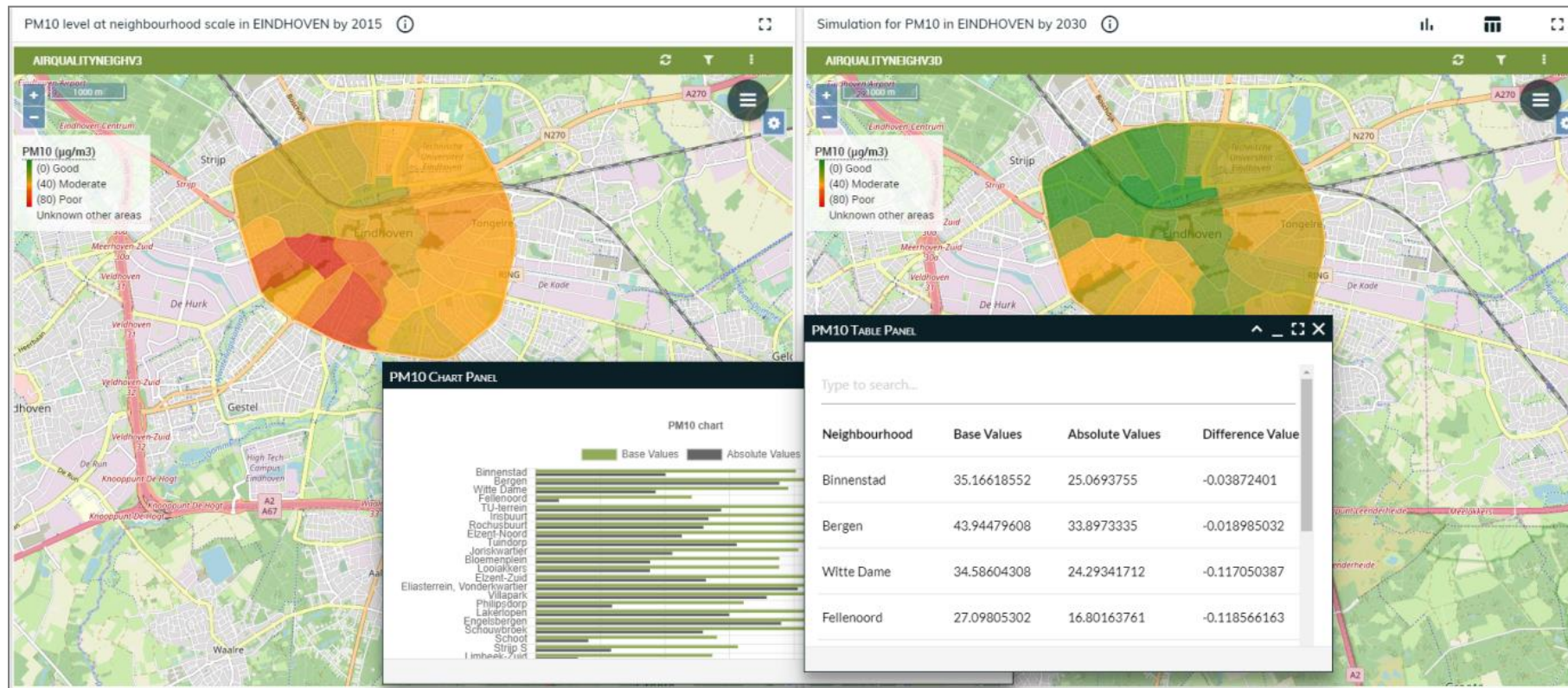
| | | | |
|--------------|---------|---------|---------|
| Target value | Minimum | Maximum | Average |
| 10 | 0.00 | 47.32 | 21.47 |

Enables users to view the performance of NBS with respect to specific parameters & defined targets



Support Evidence-Based Decision-Making

- Numerical modelling, with or without Machine Learning or Artificial Intelligence, can illustrate longer-term impacts of planned or implemented NBS
- Example: UNaLab [NBS Simulation Visualisation Tool](#)



The UNaLab NBS Simulation Visualisation Tool allows users to “forecast” longer-term impacts of different NBS scenarios

Technology & NBS Market Development: Summary

Technologies have potential to:

- Support decision making (public, private, investors) – in planning, design, valuation, & assessing performance and impact through monitoring and evaluation
- Develop the market – by connecting key stakeholders & providing evidence of NBS effectiveness
- Increase participation – by raising awareness and citizen engagement, supporting participatory governance
- Enable new finance models – e.g., cryptocurrency and shared benefit models
- Spur infrastructure improvements

There is a clear need for more & better-quality data on NBS, their impacts, & value chains

- Harness advancements of sensors, drones, Internet of Things (IoT) devices & Geographic Information Systems (GIS) to better understand how NBS should be prioritised, positioned & scaled to derive optimal benefit

Through technology, new tools can be developed to facilitate the work of decision-makers:

- Simplifying recognition of win-win scenarios & synergistic scenarios
- Integrating a robust scientific evidence base with citizen engagement
- Accelerating the process of designing better policies