

NEWS

PROJECT

PUJ - Prato Urban  
Jungle

📍 Prato, Italy

TOPIC

Sustainable use of land  
and nature based  
solutions

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EXPERT

## Prato Turns Green - From the master plan approval to the creation of urban jungles

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Prato Urban Jungle – PUJ – project will renew its city districts with greater social, productive and environmental dimensions turning itself into an urban jungle. The article explores the value of nature based solutions (NBS) and the plans developed by the Italian city of Prato to use plants in the improvement of the local urban conditions.

Land is a finite and an essential natural resource. However, nowadays, land is put under pressure from urbanisation, infrastructure, increased food demand and climate change while still being expected to continue providing key ecosystem services. In terms of urban and peri-urban areas, this means an increased effort to minimise the additional land take and better use the limited space in a multi-functional way. The fact that nature helps provide efficient solutions that utilise the properties of natural ecosystems and their services in a sustainable way is also supported by a mushrooming body of research. On the other hand, the lack of awareness among citizens regarding the benefits from NBS could lead to the risk of underestimating their importance. Therefore, Prato Municipality with the adoption of a urban forestry plan and the PUJ project aims to create healthy environment by enhancing a sustainable land use and, at the same time, by advocating citizens for improving their urban living environments.

### Multiple benefits of the Nature Based-Solutions (NBS)

Cities suffer from air, soil and water pollution, as well as from the effects of climate change such as heat islands, heat waves and flash floods - all of which are impacting cities' economy, social security and nature. Improving biodiversity and the provision of multiple ecosystem services through green infrastructure can also improve the quality of life, health and human well-being, defend against the negative effects of climate change, regenerate cities, diversify local economies, create innovative and sustainable jobs with innovative business models and governance tools. Implementing NBS towards inclusive urban regeneration in regional, urban and peri-urban areas also creates a greater sense of community, helping to combat social exclusion and reduce gentrification and inequalities within and between cities and regions. Strikingly, with the bump of the COVID-19 pandemic, themes such as urban resilience and healthy cities have gained popularity among citizens. Therefore, the placement into service of greater urban green provides benefits both for the environment and its inhabitants.



Figure 1. Green as a widespread infrastructure in the urban areas © Città di Prato

- **Improves thermal insulation of buildings:** the installation of green roofs or façade on buildings and private homes provides, among other things, greater insulation that results in cooler temperatures in the summer months and greater warmth in cooler months. This leads to a reduction in energy consumption.
- **Property value:** buildings located close to greenery have a value of 15% more than the others. Studies show that the majority of people would prefer to live nearby green areas if they could choose.
- **Improves city water management:** conventional stormwater infrastructure quickly drains rain water to rivers and streams, increasing peak flows and flood risk. Green infrastructure can mitigate flood risk by slowing and reducing water discharges.
- **CO2 reduction:** plants stock the carbon dioxide present in the air in their wooden texture. By doing so, they reduce the amount of greenhouse gases in the atmosphere.
- **Air quality improvement:** plants that are installed in an urbanised environment act as filters for some of the most harmful air pollutants. By filtering the air, plants reduce the pollution and improve the health of the living environment.
- **Aesthetic value:** plants and green spaces make our cities feel more pleasant and harmonious.
- **Food production:** plants produce nuts and fruits for animals and human beings. Additionally, they are a nectar resource for bees and other insects.
- **Biodiversity increase:** the spreading of green spaces contributes to the creation of a new layer of urban biodiversity. The presence of this new layer, with plants that create a habitat and food for different species, has a direct impact on the generation of wildlife corridors.
- **Greater climatic and acoustic comfort:** plants cool down the air through the shadow effect of their canopy and the evapotranspiration from the leaves. The bigger the canopy is, the greater the effect. In addition, green roofs, façade or walls reduce the reflection of sound in cities and improve the acoustic insulation of buildings.
- **Health benefits:** numerous studies show the beneficial effects of urban green on people such as reducing stress, decreasing respiratory and cardiovascular diseases, healing and improving concentration.
- **Improves the quality of life:** green presence in our urban environment fosters the human connection with nature and, consequently, can increase the social cohesion among inhabitants and contribute to crime reduction.

### Prato Master Plan and the urban forestry strategy

Urban forestry is the care and management of trees in urban settings for the purpose of improving the urban environment. It advocates the role of trees as a critical part of urban infrastructure and, simultaneously, supports forest preservation and promotes the many benefits trees provide.

The municipality of Prato, in September 2018, adopted a Master Plan which was then approved and put into action in March 2019. This Master Plan is the urban planning tool which establishes in detail the strategies to adopt for the regeneration, innovation and safeguard of the municipal area in a sustainable direction. In the creation of an

urban forest management plan, one of the first steps is assessing the current situation of the present trees, and then incorporating the performance goals. The urban forest assessment provides necessary information on the forest extent, age distribution, tree health, and species diversity. Once the assessment is completed, the next step becomes deciding which criteria, or indicators, to incorporate into the plan so that there are set performance goals. By doing this, the maintenance, conservation, monitoring and progress of the urban forestry are facilitated.

Prato, ambitiously, has set models of sustainable local development of two current themes in the European and national debate on urban policies, such as reuse and environment from social, cultural and economic perspectives. The Municipality is moving, along these two themes, towards sustainable land use, urban resilience, an improvement of quality in the urban environment, and the ability to address issues relating to climate change, heat island effects and air quality.

The urban planning and environment office that drafted the master plan was supported by external consultants with specific professional skills, including those of Stefano Mancuso and Stefano Boeri. The former, a botanist and a researcher, took care of the assessment of the current situation of the urban forest and its benefits. While, the latter, an architect and an expert in the use of the green in architecture, handled the strategies for the management and implementation of the urban and peri-urban forestry.

## Green benefits

The assessment and census of the existing trees in the public areas of Prato, updated to the 2015, includes a total number of 29.151 trees. Although, private trees were excluded from this census. Mancuso and his team, through the employment of devoted software (e.g. i-Tree ECO and i-Tree Canopy), inspected the species, structures, classes, ages, biomasses and the canopy dimensions, and by combining them with climate and air quality data, assessed the benefits of the current urban forest in Prato. The model highlights the percentage of ground cover, equal to 65,4 % green land (23% of trees, 38,5% agricultural land and meadows, and 3,9% of shrubs), while the remaining percentage includes the 13,8% of buildings and 20,8% asphalt.

In addition, through the simulation, they found that the current urban forest of Prato annually removes a total amount of 3.715 Kg of atmospheric pollutants, saves 2.010 Mwh of energy consumption, traps 7.891 m3 of stormwater and stocks 69.600 kg of CO<sub>2</sub>.



Figure 2. Assessment of the economic benefits derived from the carbon dioxide stocked by the plants © PNAT (<https://www.pnat.net/works/green-benefits-prato/>)

## Urban and peri-urban forestry plan

The urban and peri-urban forestry plan aims at increasing the tree-covered land, particularly in areas with a high

urbanisation rate, in order to restore green corridors through re-naturalisation processes. Throughout these processes, there will be an urban forest created which links, in a single system, existing or newly implemented parks, agricultural lands and private greenery. The urban and peri-urban plan is predicted to include 190.000 trees, around one for every inhabitant of Prato. Importantly, the action plan distinguished different categories of urban forestry:

- Peri-urban forests and woodlands;
- Urban forests and city parks (with a covered surface bigger than 5.000 m<sup>2</sup>);
- Parks (with a covered surface smaller than 5.000 m<sup>2</sup>);
- Street trees and small squares;
- Green buildings;
- Other green spaces (botanical gardens, urban agricultural lands, cemeteries, or urban voids).

In addition to this categorisation, Boeri Architects identified six strategies to be applied for the urban and peri-urban forestry plan and, for each of them, have set up an abacus of interventions and implementations.

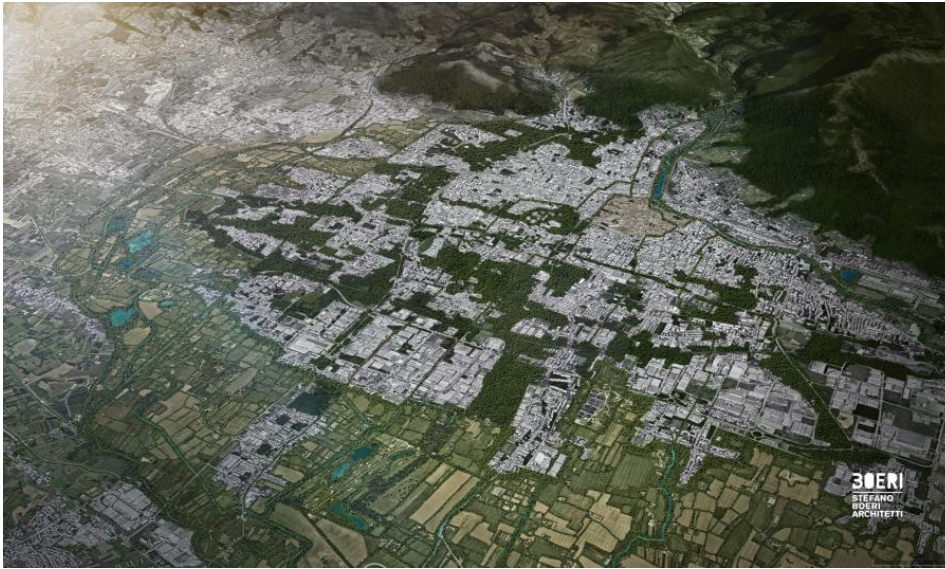


Figure 3. Helicopter view representing the the urban and peri-urban forestry plan of the city of Prato © Stefano Boeri Architetti

Among the latest tangible results of the work carried out with the Master Plan is the selection of the city of Prato within the Urban Innovative Actions (UIA) - ERDF funds - an innovative project that starts precisely from the strategies implemented by the urban and peri-urban forestry plan. The project promotes a new strategic urban planning approach with strong co-design and stakeholder engagement that will support a more inclusive green urban development in the city. PUJ is a public action that constitutes a driving force for the implementation of environmental policies, and therefore the quantification of environmental effectiveness.

***Article written by Daniela Patti, UIA expert supporting the Prato Urban Jungle project.***

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