



EUROPEAN UNION



# EU MISSIONS

ADAPTATION TO CLIMATE CHANGE



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## Revitalising urban industrial districts with Nature-based Solutions in Turin, Italy

### How Nature-based Solutions benefit health, innovation and social life in cities

*Turin, once a major industrial hub, faced economic decline in the 1980s and '90s, leaving behind vacant spaces, social segregation, and urban challenges. Targeted Nature-based Solutions address these issues, transforming local weaknesses into opportunities for green growth and innovation.*

#### Key Learnings

- **Improving urban health:** Improving the accessibility to green infrastructure for citizens can improve human wellbeing and urban health, as green spaces evidently enhance the quality of life in cities.
- **Preparing the ground for new green businesses and jobs:** The introduction of novel and innovative Nature-based Solutions encompasses knowledge transfer and training, which can create the right conditions for green entrepreneurship and green jobs.
- **Stakeholder management and inclusive participation:** Effective stakeholder engagement requires strong coordination to involve a diverse range of community members, including different ages, backgrounds, and interests, in decision-making. Inclusive participation ensures everyone's voice is heard, building awareness, acceptance, and social cohesion. This approach also fosters lasting public-private partnerships and shared maintenance responsibilities by creating trust and a sense of ownership.

## About the region

Turin is the capital of the Piedmont region and one of Italy's economically most important cities. Since the 1990s, it has been transforming from an automotive industrial centre into a hub for start-ups and business innovation. Park networks, green cycling lanes, and green corridors along rivers and former railway lines make Turin one of Italy's greenest cities. The district of Mirafiori Sud is a former working-class area with 40,000 inhabitants and various social groups. The area holds strong potential for urban regeneration, with its active local associations, rich cultural heritage, and disused industrial buildings that could be repurposed for new community ventures.

## Climate Hazards

Extreme Heat, Flooding

## Sector

Biodiversity protection, Urban

## Key system

Ecosystem and Nature Based Solutions



## Climate Threats

Mirafiori Sud District in Turin faces pressing climate threats, including recurring flood events, rising temperatures, and poor air quality. Impermeable surfaces, degraded and polluted soils and a lack of green infrastructure reduce the district's ability to manage heavy rainfall, increasing the risk of localised flooding. At the same time, the lack of green spaces and many unused, abandoned housing areas causes temperatures to rise, making heatwaves more intense and reducing residents' comfort during the hot summer months. Air pollution, driven by high private vehicle use and emissions from a nearby waste incinerator, further compounds the impact of extreme heat, particularly on vulnerable populations.

## Local Situation – the challenges at Mirafiori Sud

The environmental risks are closely intertwined with long-standing socio-economic challenges in the area. Following industrial decline in the late 20th century, Mirafiori Sud has experienced depopulation, an ageing population, and high unemployment. Social inequality and poor public health outcomes, especially related to cardiovascular, respiratory, and mental health, amplify the district's vulnerability to climate stressors.

Nature-based Solutions can effectively address these intersecting challenges, restoring ecological functions, enhancing climate resilience, and creating healthier, more inclusive urban environments. By transforming underused or degraded spaces into green, multifunctional areas, Nature-based Solutions offer a sustainable path toward environmental recovery and social regeneration in Mirafiori Sud District.

## Reacting to the challenges at Mirafiori Sud District

Between June 2018 and November 2023, the [ProGIreg](#) project implemented a range of Nature-based Solutions in Mirafiori Sud District, transforming local environmental and social challenges into

opportunities. These interventions aimed to improve public health, enhance biodiversity, and reduce social segregation through sustainable urban regeneration.

The project was led by the [City of Turin](#) in collaboration with local universities ([Università degli Studi di Torino](#), [Politecnico di Torino](#)), citizen associations and NGOs active in the district (such as [MIRAFIORI](#) and [ORTIALTI](#)), as well as industry partners ([DUAL](#) and [ENVIPARK](#)). European funding supported the initiative with approximately €800,000, fostering citizen participation and co-creation as key drivers of change at Mirafiori Sud District.

### 1. *Directly implementing Nature-based Solutions:*

- *Refurbishing derelict buildings with **green roofs and walls** at derelict buildings and transforming brownfields into **community gardens**.*
- *Creating **new green corridors/ parks** to improve residents' accessibility to green spaces and enhance recreational opportunities.*
- *Applying **special rejuvenated soils** to re-inject life into depleted and infertile soils.*
- ***Improving biodiversity with pollinator-friendly gardens.***

### 2. *Improving social life and citizen awareness for green solutions:*

- *Applying **collective farming practices** for urban regeneration in green spaces and social life. For example, by involving educational institutions and residents in experimenting with horticultural environmental restoration practices.*
- *Transforming brownfields into **community gardens**. On the one hand, this action revitalises unused spaces, and on the other, it supports social interactions and a sense of community belonging.*

### 3. *Securing long-term value and maintenance:*

- *Design, manage and maintain green infrastructure together with local businesses, associations and citizens.*
- *Enable shared management to build a sense of community amongst residents and joint responsibilities.*
- *Creating a strategic public-private partnership for greening the city.*

The complexity of some Nature-based Solutions required industry partners' expertise and the involvement of several local stakeholders. To effectively plan and manage the interaction with all relevant stakeholders, ensuring successful implementation, the local project management team established subordinate management boards. Each board designated several relevant project partners to coordinate the activities of each implementation site.

The core team, led by the City of Turin as overall coordinator, facilitated a collaborative planning process with local partners. The team invited relevant stakeholders for each site concept to discuss their needs and concerns. Before implementing the Nature-based Solutions, the City of Turin and the two universities

conducted a stakeholder mapping and spatial analysis to identify the area's strengths and weaknesses. Citizen associations and NGOs of the Mirafiori Sud District, such as the MIRAFIORI NGO, designed and coordinated community engagement activities to ensure meaningful participation.

## Measure Effects



*Figure 1: Creation of accessible green corridors. Image Credit: [ProGReg](#).*

After the project team agreed upon the organisational setup, they implemented the Nature-based Solutions in collaboration with diverse local stakeholders. Overall, they realised 17 interventions.

Since addressing social fragmentation was a key goal, each intervention emphasised co-creation, awareness-raising, and fostering local engagement. The new green corridors improve resident access to public green spaces, supporting physical and mental health through increased exposure to nature and opportunities for outdoor activity. At “Piedmont Park” located in Mirafiori Sud District, an ecosystem path showcases agricultural, horticultural and beekeeping activities, promoting environmental education and local engagement.

The project team created nine pollinator-friendly gardens (Figure 2) designed to engage schools and socially disadvantaged groups to promote and raise awareness about biodiversity. Researchers from the University of Turin supported the initiative by involving individuals with mental health challenges in educational activities. Those addressed social isolation and stigma while encouraging the participants to become scientific ambassadors and actively contribute to the project.

Another project action included realising so-called Aquaponics – testing the combination of raising fish (aquaculture) together with soilless cultivation of plants (hydroponics) – whereby the fish wastewater provides the nutrients needed to feed the plants. In response to the poor soil quality in parts of Mirafiori Sud District, this closed-loop system, developed in collaboration with local NGOs, enables healthy food production without relying on contaminated soils. Beyond food production, aquaponics also supports the creation of local green jobs, as the system requires regular monitoring and maintenance.



*Figure 2: Orti Generali in Cascina Piemonte. Image Credit: [ProGReg](#).*

To raise awareness of sustainable farming, the project team collaborated with local primary schools to create educational materials and implement several Nature-based Solutions at the schools, improving

environmental quality. These include a 20 m<sup>2</sup> indoor green wall in a school atrium and an 80 m<sup>2</sup> outdoor green wall on a homeless shelter, which enhanced aesthetics and insulation. Additionally, a 140 m<sup>2</sup> green roof on an abandoned building in Mirafiori Sud, planted with native meadow seeds, supports biodiversity and regulates temperatures. These interventions help reduce air pollution, lower temperatures, and improve public spaces.

One of the project's main interventions was establishing the 12,000 m<sup>2</sup> community garden at the "Cascina Piemonte" area, where the project team created 160 allotment gardens and planted 330 trees. They transformed 30% of the area into a shared green space. The concept encourages citizens to contribute to maintaining the common spaces. The University of Turin supported the project by advising on suitable tree and shrub species and was responsible for environmental monitoring, experimentation, and the dissemination of new soil concepts. These community gardens support awareness-raising about nature and urban wellbeing. They also have strong potential for improving social interaction (social cohesion) and urban health. As welcoming, shared green spaces, they have become natural gathering points where residents can connect, collaborate, and build a stronger sense of community.

*"The inauguration of the new vegetable gardens at Piedmont Park represents an important step for the City of Turin as it invests in green spaces for improved quality of life. Orti Generali sees itself as a virtuous land regeneration project and demonstrates how horticulture and participatory urban agriculture can positively impact biodiversity and local community participation. "*

*Councillor for green areas of the City of Turin, Francesco Tresso (translated from Italian, cited by [Citta di Torino 2025](#))*

## **Maintenance of the implemented Nature-based Solutions**

The project team handles the maintenance of each Nature-based Solution in Mirafiori Sud District on a case-by-case basis. To ensure long-term maintenance beyond the project's duration, the management team has formed partnerships with local stakeholders, such as NGOs, schools, community groups, and public-private collaborators. In cooperation with the City of Turin, the team introduced sponsorship programs to foster strategic public-private partnerships and secure sustainable funding for preserving and improving green spaces in Mirafiori Sud and the wider city.

## Summary

The Nature-based Solutions at Mirafiori Sud District in Turin address multiple challenges related to climate change adaptation, urban health and social issues in the district. The focus lay on preparation and organisation to ensure the inclusion of a broad and diverse group of relevant stakeholders. Establishing an effective organisational structure proved essential for planning, coordinating stakeholder engagement, and ensuring successful implementation. Addressing local challenges through Nature-based Solutions was complex but offered valuable insights into the tangible and intangible benefits Nature-based Solutions can deliver to communities.

In Mirafiori Sud, the initiative played a key role in urban regeneration and transformation by piloting green innovations, sharing best practices, raising awareness, and integrating education and expert knowledge. A strong emphasis on social cohesion helped improve stakeholder communication and supported the inclusion of disadvantaged groups. From an economic perspective, the project contributed to shaping a new, green identity for the district, laying the foundation for green entrepreneurship, job creation, and establishing enduring local networks and public-private partnerships that are expected to continue well beyond the project's conclusion.

## Further information

The work presented in this adaptation story is part of the [ProGReg](#) project.

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- <https://cordis.europa.eu/project/id/776528>
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