



*Life*  
**METRO**  
**ADAPT**

Strategie e misure di adattamento al cambiamento  
climatico nella Città Metropolitana di Milano

## Enhancing climate change adaptation strategies and measures in the Metropolitan City of Milan

20th April 2021

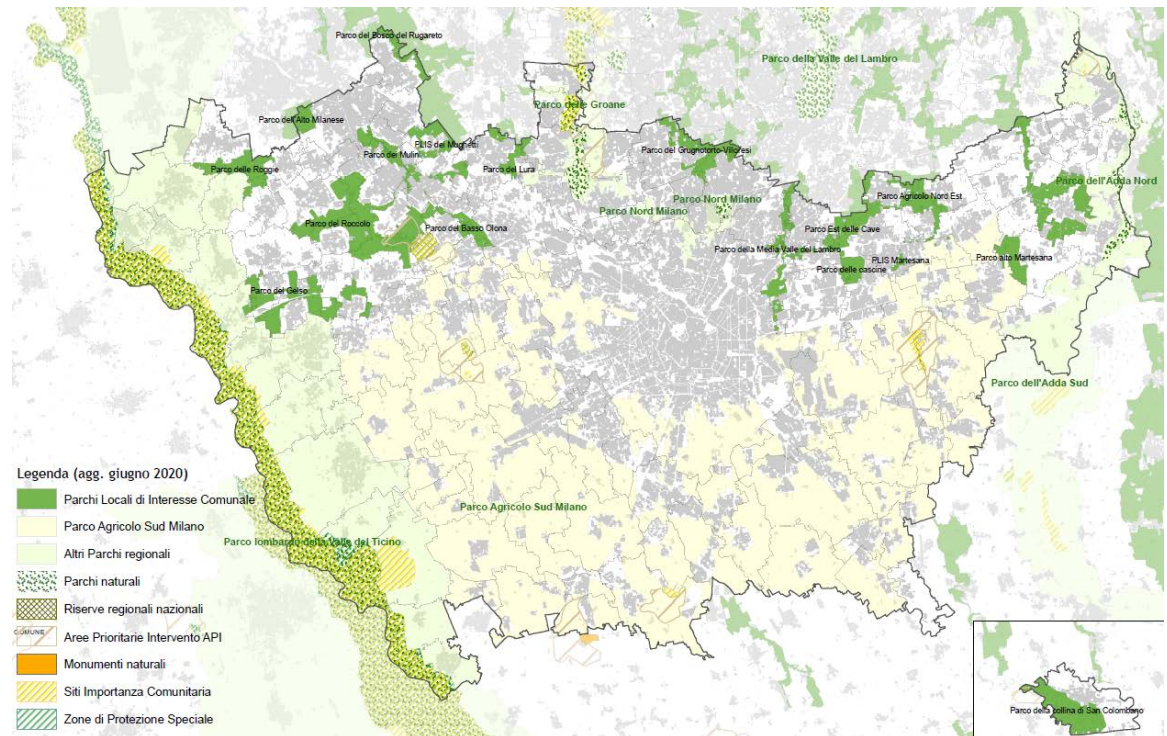
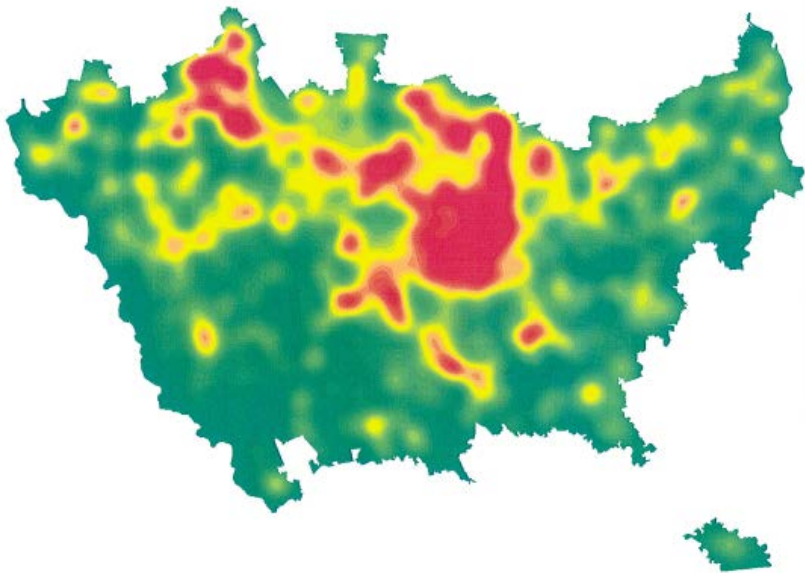
Cinzia Davoli & Marina Trentin



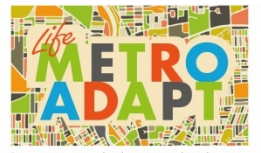


# Metropolitan City of Milan : territory and institution

The Metropolitan City of Milan is among the most densely populated urban areas in Europe with a density of about **2,038 inhabitants/km<sup>2</sup>** for a total of **3.2 million inhabitants** (2016) and a demographic structure formed for **22% over 64 years old**. Its territory is about **1600 Km<sup>2</sup>** distributed over **133 Municipalities, including the city of Milan**, and is about **41%** formed by **build-up areas and infrastructures**, **50%** formed by **agricultural areas** and only **8%** formed by **woodlands**.



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# Metropolitan City of Milan : territory and institution

The MCM is a **medium level local public authority** established in 2014 and governs the vastest metropolitan urban area in Italy.

The MCM implements and coordinates activities of **strategic and territorial planning, sustainable mobility and urban public transports**, including greening issues, digital agenda and has responsibility in environmental field especially for quarries, land reclamations and waste dumps.

**The MCM plays a crucial role in the adaptation process**, just like all Metropolitan cities authorities.

Its role is fundamental in setting a comprehensive strategy for its wide and whole territory, **enhancing the mainstreaming of adaption measures at all the local levels and coordinating all the different planning and operative tools.**

Actually the whole Metropolitan Area of Milan is prone to **flood risk** due both to the increased peak flow of rivers and to the **runoff generated by the compact, not permeable urban fabric.**

Other critical issues are increased mean **temperatures, frequency and intensity of heat generating urban heat islands** increased demand, sudden and heavy rainfalls, summery waves heat-islands, energy ozone levels exceeding.



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# LIFE METRO ADAPT - enhancing climate change adaptation strategies and measures in the Metropolitan City of Milan

(Life 17CCA/IT/000080 – CUP I43E17000230007)

- Project duration:** Start: 03.09.2018 - End: 30.09.2021
- Budget info:** Total amount: 1.306.010 - % EC Co-funding: 59.95%
- Project's Implementors:** Città Metropolitana di Milano (Coordinating Beneficiary)
- Associated Beneficiaries:** ALDA (European association for local democracy, FR)
- Ambiente Italia S.r.l. (IT)
- CAP Holding S.p.A. (IT)
- e-GEOS S.p.A. (IT)
- Legambiente Lombardia Onlus (IT)



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# Life METRO ADAPT : Policy implications and expected impacts

The project aims to contribute to EU priorities providing a common methodology focused on metropolitan areas role in supporting urban planners and policymakers engaged to establish climate adaptation activities.

**METRO ADAPT** project will **contribute to**:

- **Developing and implementing local adaptation and mitigation initiatives**, like 'the Covenant of Mayors for Climate and Energy', including cooperation between local authorities;
- **Developing innovative adaptation solutions** in urban areas involving the water, energy and construction sectors and **territorial green infrastructures** to implement climate change adaptation measures;
- **Implementing public-private partnerships** and **enhancing the awareness raising** of public bodies, citizens, political and technical stakeholders through newsletters, handbook reporting, website, events, seminars, conferences and workshops at **national and european level**.

**METRO ADAPT** project will **realize**:

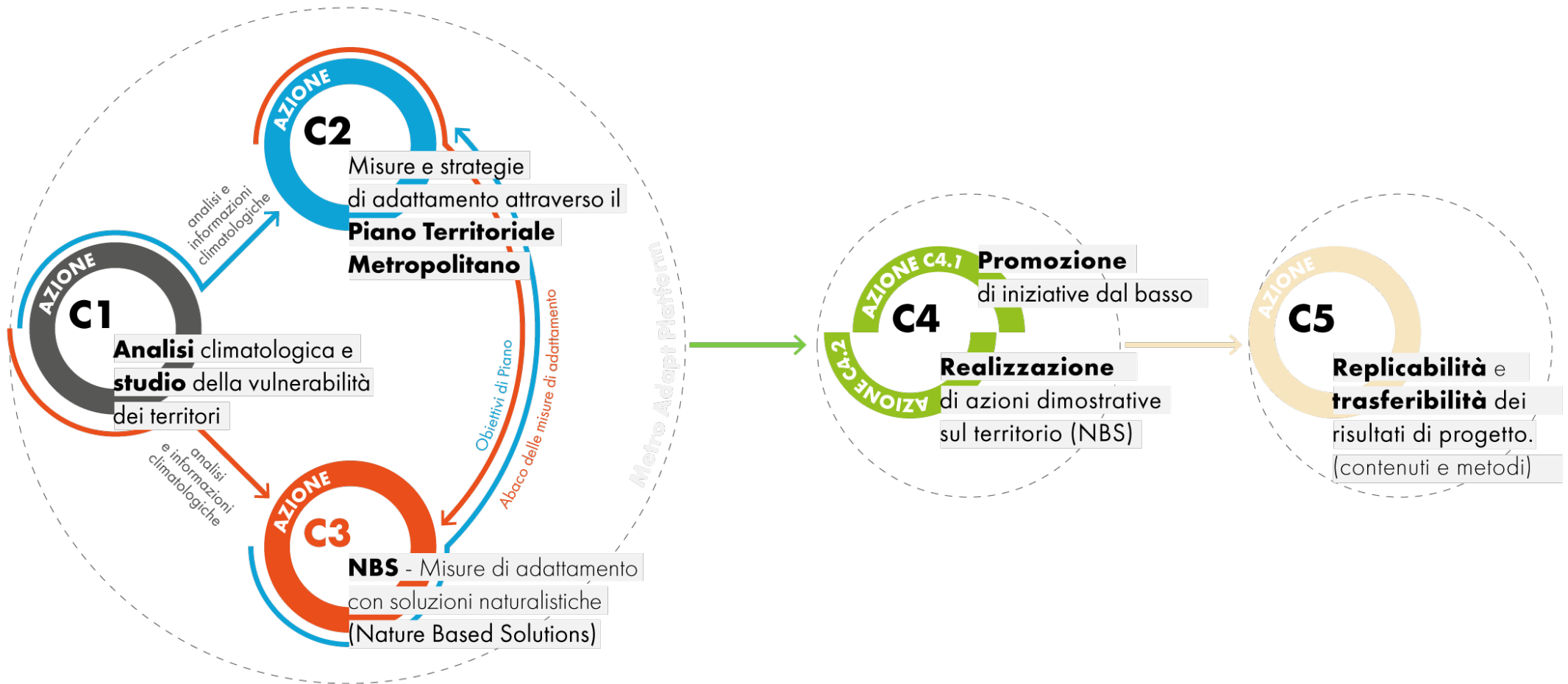
- **133 datasets** for local adaptation and mitigation planning available to all MCM municipalities;
- **Legal standard and rules** enhancing resilience measures in the PTM for local planning tools and **guidelines for vulnerability assessment**;
- Promotion and development of a **Metropolitan Green Network** to reduce **the impact of urban heat islands**, to reduce **urban sealing** and to control the **flooding risk**;
- **Realization of 2 NBS demonstration facilities** in two municipalities to disconnect 8000 m<sup>2</sup> by the sewage network and **2 NBS feasibility studies in different Municipalities** focused on small/medium size areas with high multi-level performance.



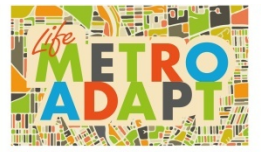
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# Life METRO ADAPT : outline of project actions



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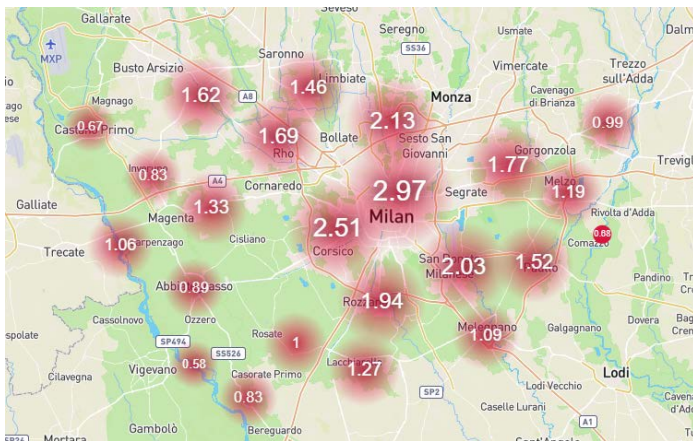
# Action C1: Climate analysis and vulnerability assessment at metropolitan level

## Objective 1: Development of analysis

- innovative meteorological satellite data
- high precision soil sealing maps
- detailed analysis of soil permeability
- risk analysis (population and hazard)

FREE availability of data and information on OPEN platform

Availability of **disaggregated data** available to each municipality of the Metropolitan City of Milan



**METRO ADAPT PLATFORM**  
+  
**THEMATIC MAPS**  
+  
**WEB MAP SERVICE**



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# Action C2: Evaluation and mainstreaming of climate change adaptation measures in metropolitan planning

## Objective 2: Adaptation strategies and actions

Integration of data, strategies and proposals for adaptation actions in the MTP

Integration of adaptation actions in the urban planning tools of the municipalities of the Metropolitan City of Milan.

Innovative approach intermediate governance entities  
(7 homogeneous zones)

## METROPOLITAN TERRITORIAL PLAN



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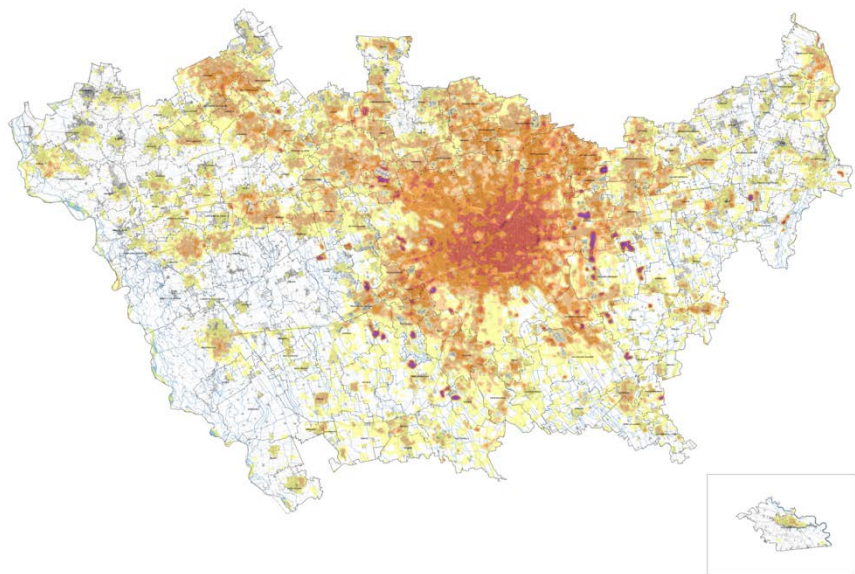
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# PTM and climate change : legal rules for Municipalities

For the first time in Italy, the ACT of a territorial plan for large areas contains an innovative part dedicated specifically to the government of environmental emergencies with a specific section reserved to climate change that includes rules enhancing resilience measures in the local planning tools.



Analisis providede by the METRO ADAPT project has been used to develop a map representing the heat-island phenomenon in summer nights all over the metropolitan territory. Municipalities with areas with night values exceeding the reference value considered in the “map of thermal anomalies” by at least 3 degrees centigrade are required to develop a specific study to reduce this thermal anomaly. For these areas the PTM provides guidance on the actions that Municipalities have to implementate to mitigate the thermal anomalies and to integrate in municipal plans and regulations (such as Municipal Building Regulation, Green Plan, Urban Traffic Plan, Sustainable Urban Mobility Plan, etc.).

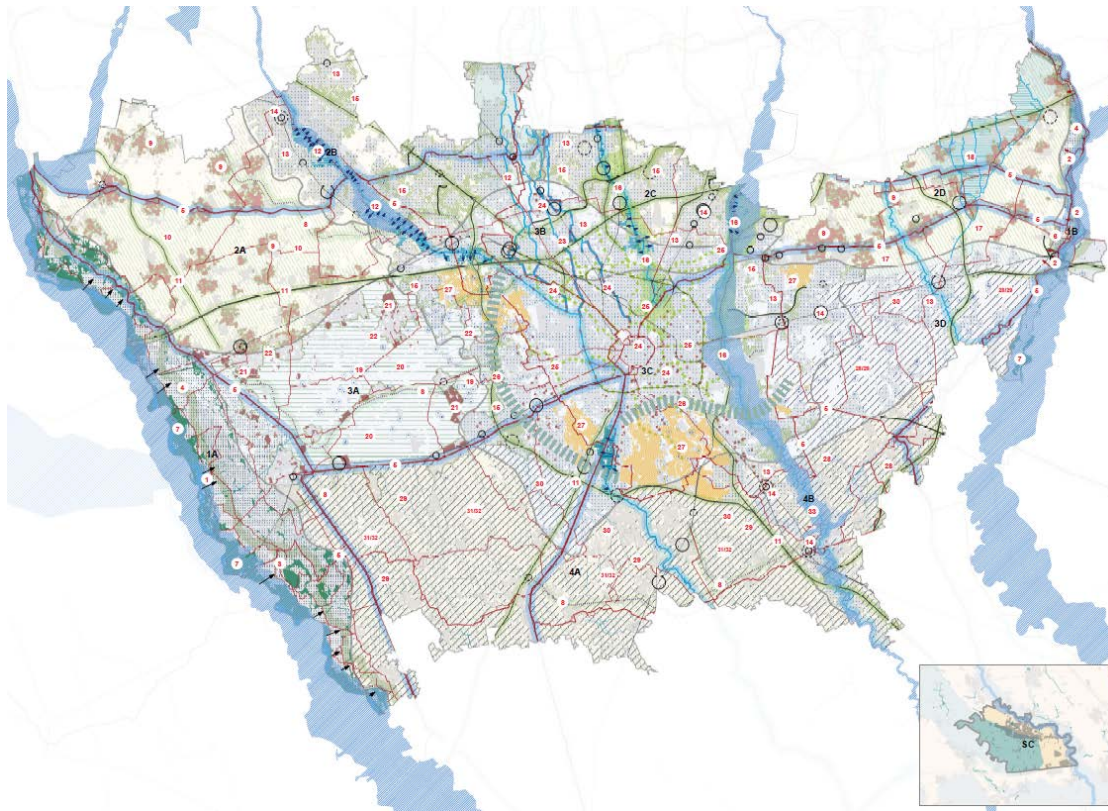


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# PTM and climate change : the Metropolitan Green Network project

A **Metropolitan Green Network** project was drawn up in the PTM as the **general climate change adaptation strategy**, with particular reference to meteoric water management and heat island mitigation and as a supporting element for the **qualification of non-urbanised territory**.



The Metropolitan Green Network project is based on the intrinsic characteristics of the different metropolitan landscapes, their structure and functions, subdividing the whole territory into **Landscape Unit Environment (UPA)** defined on the basis of overlapping analysis and synthesis evaluations.

Specific **planning priorities** are then defined **for each UPA**. The planning priorities are articulated in actions to be implemented with the priority use of **Nature based solutions** selected according to the different territorial characteristics.



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# Action C3: Overcoming uncertainty and barriers to adoption of Nature Based Solutions in an urban context

## Objective 3: Identification of adaptation actions

Analysis and feasibility studies of Nature-Based Solutions (NBS)

Dissemination of technical and design knowledge in the field of NBS

Dissemination of a multi-objective approach among the actors involved in decision-making and implementation processes

**NBS CATALOGUE**  
+  
**illustrative cards for each NBS**



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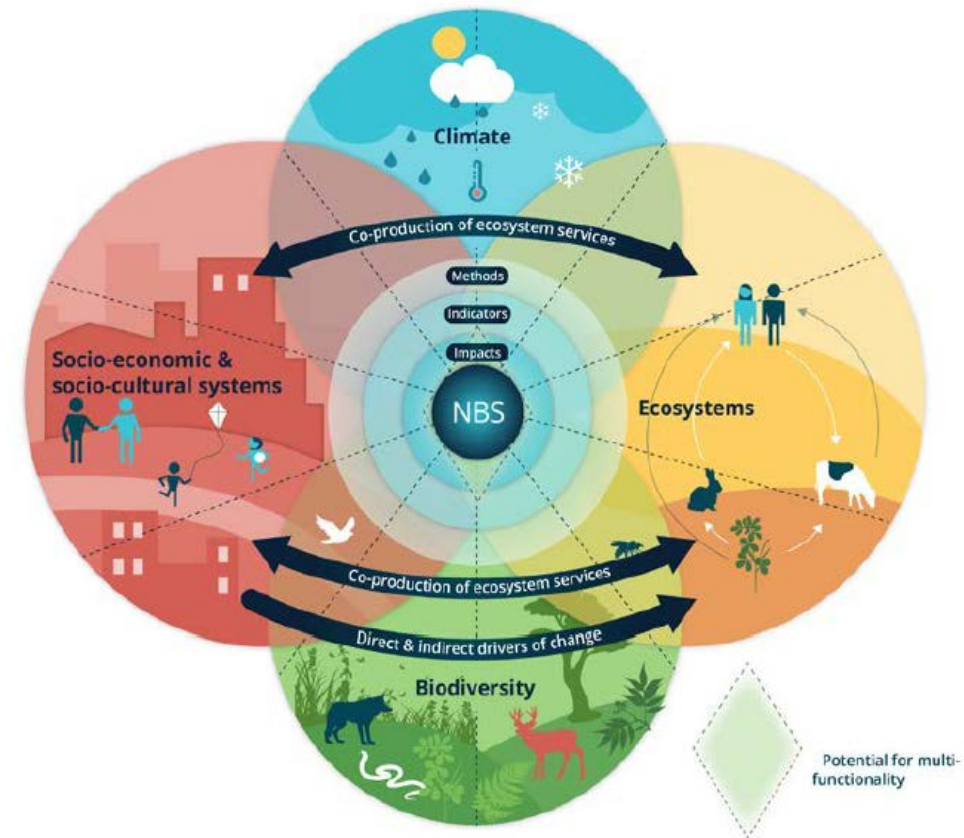
# Nature Based Solution in a nutshell

These are solutions with characteristics of **complex ecosystems that use or are inspired by nature's processes.**

They have the ability to bring the characteristics and processes of nature into urbanized environments.

They are **potentially multi-objective solutions: environmental, social, economic.**

Using natural flows of matter and energy, they tend to be low-resource solutions that, if developed properly, can be more efficient than others.



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# Nature Based Solution HANDBOOK

The handbook of 20 NBS has been produced to illustrate the solutions that can be implemented in urban and peri-urban areas, specifying their scale of application, describing their environmental and socio-economic benefits, the advantages and disadvantages and providing examples of good practices.

Each NBS scheme profile reports a brief description of the NBS, technical information on planning and design, pros and cons, management and maintenance aspects and two to three selected best practices

The different types of NBS applicable to the urban and periurban context, have been categorized according to their primary role: water management, green solutions on built environment, and ground green spaces



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# Nature Based Solution HANDBOOK

NBS for the metropolitan city of Milan:

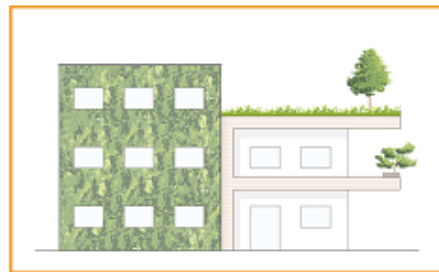
Water  
management



**GESTIONE  
ACQUE**

MISURE DI ADATTAMENTO

Green on built  
environment



**VERDE  
TECNICO IN  
AMBIENTE  
COSTRUITO**

MISURE DI ADATTAMENTO

Ground green spaces



**VERDE  
URBANO A  
SUOLO**

MISURE DI ADATTAMENTO



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# Feasibility studies - Parabiago and Buccinasco



The first feasibility study concerns the improvement of the drainage and infiltration capacities of rainwater in a stretch of road, including its appurtenances and parking lots, located in the Municipality of Parabiago (MI), where the Municipality foresees an intervention of extraordinary maintenance and modernization of the road network.

	Scenario 1	Scenario 2
<b>Alternativa 2</b> Trincea infiltrante		
<b>Alternativa 3</b> Area di bioritenzione		



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# Demo Sites – Solaro e Masate



## Water management pilot project in Masate

A first pilot water management intervention has been realized thanks to the LIFE Metro Adapt project in Masate, an area with high hydraulic risk associated to a growing urban expansion. The intervention aims to convey and dispose of stormwater coming from a parking lot and a portion of the provincial road in a special retention system.



## Intervention to reduce stormwater runoff to the sewer system in Solaro

In an area of strong residential expansion, we have realized an intervention to reduce the contribution of rainwater to the sewer system. The project involved the construction of a special drainage system in a public parking lot, developed in two different portions.



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Thank you for your attention !

Info :

Life MetroAdapt website : <http://www.lifemetroadapt.eu/it/il-progetto/>

Metro Adpt Platform : [https://www.cittametropolitana.mi.it/Life\\_Metro\\_Adapt/](https://www.cittametropolitana.mi.it/Life_Metro_Adapt/)

Metropolitan Territorial Plan website : <https://www.cittametropolitana.mi.it/PTM/iter/adozione/index.html>

