

Exploring visionary Architectural concepts for the green transformation of the city of Milan.

Professors: Juliette Bekkering and Michiel Riedijk, with Leonardo Zuccaro Marchi and Rocco Vitali curated by Pierre-Alain Croset

#### **Foreword**

In the educational mission of the Advanced School of Architecture (ASA), a decisive role is played by the experimentation of new ways of designing within the Masterclasses. Unlike in normal design studios where each student freely explores a well-defined design theme, in ASA's Masterclasses students collaborate with each other and develop a kind of 'collective project' under the guidance of invited professors, in a form of work more akin to the 'group creativity' experienced in competition projects in large professional firms. The Milano Verde 2050 Masterclass demonstrates this in an exemplary manner. The final results illustrate real 'urban visions' for a part of Milan today suffocated by pollution and the noise of cars whizzing along Via Palmanova. Even though each student has declined individually, and with a strong subjective investment, the ambitious brief proposed by Michiel Riedijk and Juliette Bekkering, they all concur in offering a collective urban vision, in which architecture always appears as the protagonist: architecture of buildings, but also and especially architecture of water, of the landscape, of infrastructures, of atmospheres evoked in beautiful drawings produced in the very short time of just one week. I would like to thank everyone for their passion and great commitment: the invited professors Michiel Riedijk and Juliette Bekkering, together with their collaborators Rocco Vitali, Leonardo Zuccaro Marchi and Arian Heidari, the students all, and also Elena Quarestani and the entire ASSAB ONE team who hosted the final exhibition in a prestigious location on the Milanese art scene

Pierre-Alain Croset, Director of Advanced School of Architecture (ASA)

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# **Assignment & program**

### **Assignment**

The Masterclass *Milano Verde 2050* at the Advanced school of Architecture of the Politecnico Milano aimed at three different objectives:

**Study** the relationship between Architecture and Nature;

**Explore** the relation between design and representational means, through collages;

**Formulate** and apply concepts regarding Architecture and Nature within the Milanese territory, assuming it is 2050.

#### Location

The locations for the assignment form a strip of 18 blocks of 250x500 meters projected on the Map of Milan, from *Piazzale Loreto* along *Via Palmanova*. This strip is turned into a new green belt within Milan. All design interventions depart from the existing morphology, redesigning and reinterpreting it to improve the urban quality.

#### **Assignment**

The architectural assignment was a *House for Biodiversity*, an institute studying Biodiversity. The designs departed from a zoning envelope of 30x30x30 meters, however the given zoning could also be transformed into any other envelope that was appropriate. Next to this all designs had to accommodate 100 trees and rainwater storage on site.

#### **Themes**

The relation between Architecture and Nature is further explored by addressing four themes. Any participant addresses all themes, in a specific manner related to his or her site. The themes are:

- Water (Water retention, water purification, water gardens..)
- Wind (energy production, energy storage..)
- Sun (energy production, energy storage, light, heat...)
- Biodiversity

#### **Means**

The architectural design has been explored in section, in particular with collages. To focus on the design process all output was crafted with collages, to understand that collages can be used in three different manners within the design process:

- As means for ideation
- As means of expression
- As instrument to propel the design process.

#### **Program**

#### Lectures

During the Masterclass the following lectures were given, to provide knowledge and background information:

Friday 5th: Michiel Riedijk:

'Collage, Montage, Assemblage: Milano Verde 2050'

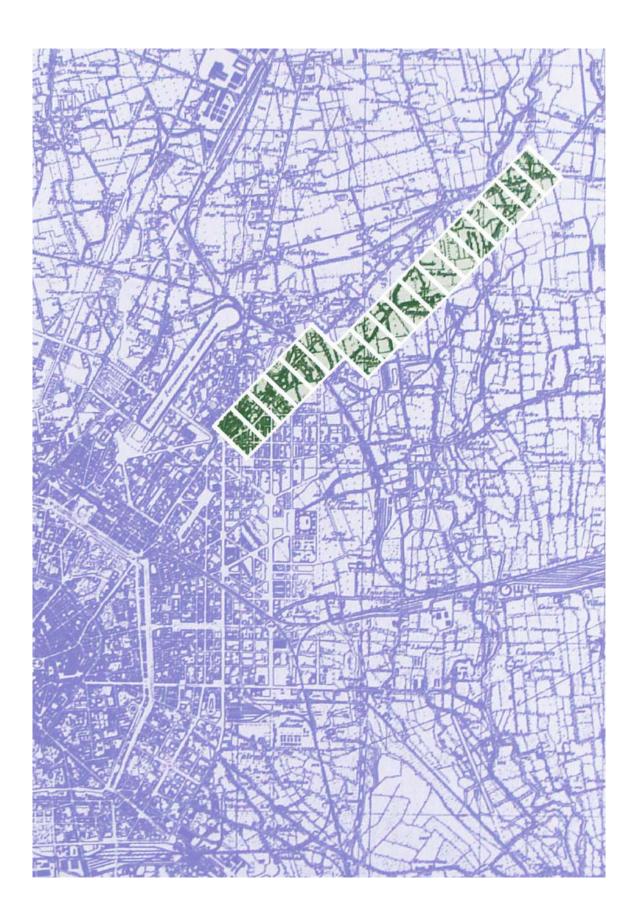
Friday 5th: Pierre-Alain Croset and Elena Fontanella: 'Historical Maps and the urban development of Milan'

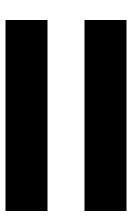
Monday 8th: Andrea Oldani: 'The water systems of the Milanese region'
Monday 8th: Juliette Bekkering: 'Architecture and Nature'

**Tuesday 9th:** Juliette Bekkering and Michiel Riedijk: *The work of Neutelings Riedijk Architects* 

#### Presentation

All designs are displayed at **ASSAB-ONE gallery** in Milan from **Friday 12th till Friday 19th 2024** 





# Historical development of Milan A Comparison

The comparison of historical maps of Milano and the site areas exhibits interesting and valuable considerations for masterclass activities.

Overlapping the strip of development (4500x500 m) with the historical maps of Milano since the XVI century first shows that the area of interventions is as big as the city centre. The dimensions of the project site are comparable with the areas of Milano as it has been framed for centuries, allowing us to rethink the new strip as a potential new city with its own dimensions.

The Lazzareto (built between 1489 and 1509), with its square shape towards the northeast, is the main comparable area and project near our area of interest in terms of dimension: Lazaretto was 378m x 370 m, while each sector of the green strip is 500x250m.

Second, it is clear that until the middle of the last century, our project area was conceived as part of the ingens sylva outside the walls of the Milan urban fabric. The project site has been absorbed by the urban structure only recently in the last century, in terms of administrative boundaries, urban structure and mapping representation of the city itself. It has been mainly since the XIX century that Milano has been represented by embracing territory outside historical walls as its expansion of ownership and expression of urban identity.

Zooming into the area between Piazza Loreto and Cascina Gobba, the radical and rapid shift from an agricultural to an urban identity of the area becomes evident. The 1818 map still shows the area as a patchwork of agricultural fields, with small communities of towns, cascinas framed within a hierarchical water networks of navigli, canals, fontanili. Only via Padova linearly cuts the rural land-scapes of organic water streams and tetris of cultivated fields.

On the 1910 map, the city is already expanding beyond Piazzale Loreto until the new urban border, defined by the new railing infrastructure. Only after the Second World War did the expansion of the urban structure incorporate the entire site, overlapping modern infrastructure grids to the existing historical agricultural patterns, tracing new functionalist streets for fast transport car-driven systems like via Palmanova and the metro line, partializing, shifting and mutating the water streams like the fiume Lambro. The city expanded towards the east until the railing, then towards north on the western side of via Palmanova as new edge and after towards east again, with an urban expansion ballet of new negotiations, and complex dialogues between artificial and natural, functionalist and organic, social and economical which area will still have to face in 2050.





1704 STOOPENDAAL, DANIEL Milano Fonte- Milano, Civica Raccolta delle Stampe Achille Bertarelli



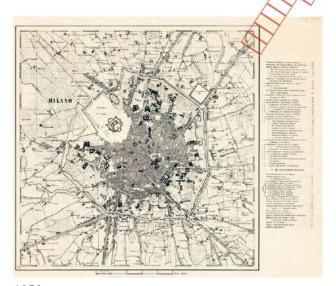
1783 CAGNONI, DOMENICO Pianta della città di Milano Fonte- Milano, Civica Raccolta delle Stampe Achille Bertarelli



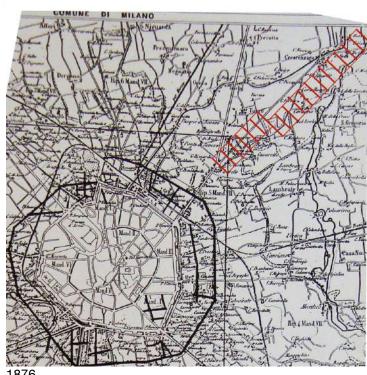
1814 RIVA FINOLI, CARLO Pianta topografica di Milano Fonte- Milano, Civica Raccolta delle Stampe Achille Bertarelli



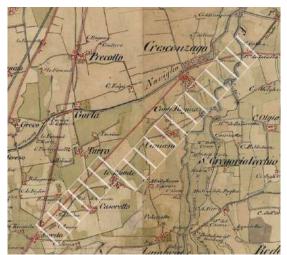
1820 BOSELLI, GIOVANNI – RINALDI, FRANC-ESCO Milano. Pianta topografica Fonte- Milano, Civica Raccolta delle Stampe Achille Bertarelli



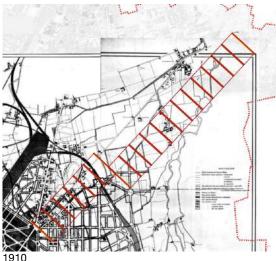
1853 VALMAGINI, FRANZ Milano Fonte- Milano, Civica Raccolta delle Stampe Achille Bertarelli



FASANA Piano Fasana Fonte- Milano, Civica Raccolta delle Stampe Achille Bertarelli



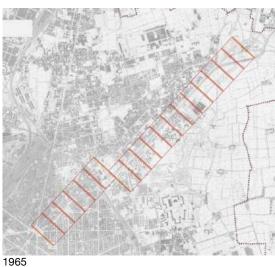
1818–1829 \_ Lombardy, Venice, Parma, Modena - Second military survey of the Habsburg Empire



1910 Cartografie Storiche di Milano



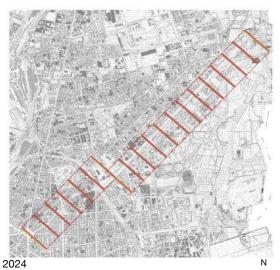
Cartografie Storiche di Milano



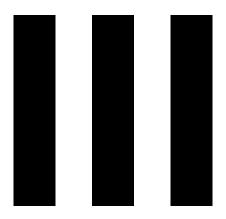
Cartografie Storiche di Milano



Cartografie Storiche di Milano



Cartografie Storiche di Mil Cartografie Storiche di Milano



# An architectural journey to a green Milano 2050

The Architecture of the City of Milan has a long lasting history of developing Nature and Architecture in close proximity both on the level of the city as on the level of the single architectural intervention.

In times in which the effects of climate change, loss of biodiversity and far-reaching urbanization are increasingly palpable, we as designers are faced with the challenging task of developing new scenarios for a built environment in which nature is given a prominent role. Not only for a future-proof city, to combat the loss of biodiversity, flooding problems and to counteract the heat island effect. But also in the knowledge that nature has a positive effect on the well-being of people and animals. That nature, filtering the air and water, designing with the sun, rain, air, plants, are crucial for a pleasant living environment. All this embedded against the background of a city that historically was closely intertwined and defined precisely by those natural flows of water and rivers, of the imprint of agriculture and parceling, urban developments with buildings and infrastructures, against a backdrop of the majestic peaks of the Alps.

In this setting, we conducted a master class in which we challenged 18 students to develop scenarios for a green and biodiverse city and asked the question: How can Milan transform into a city in 2050 where plants, animals, water and wind have their place in the urban fabric?

And how can we do this in a sensible way, taking into account the city's historical developments and structures, such as navigli structures, rivers, infrastructures and green plans.

This exhibition showcases 18 designs, reflections, concepts, scenarios, all giving a specific view of the future. Each participant received a part of a 4.5 km strip along Via Palmanova.

In addition, 18 buildings were designed by the students, focusing on the synergy between nature and architecture. The tool we chose for this was the collage. The collage as a design tool has a long tradition in the representation of scenarios and designs in architecture, and more specifically in Italy. Precisely by choosing a mode of representation where juxtaposition, assemblages, citations, references, the drawing and the technique of the palimpsest can be employed interchangeably, a means is created to represent the multilayeredness of the task.

Furthermore, the assignment consisted of making sections: 1:500 and 1:200, since for us the section, where the richness of the imagination is condensed into a spatial composition, gives the viewer an insight into the representation of the task.

Before you will find

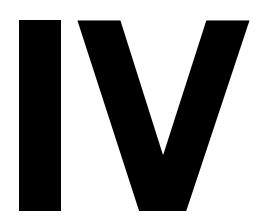
18 floor plans 1:500

18 sections 1:500

18 sections 1:200

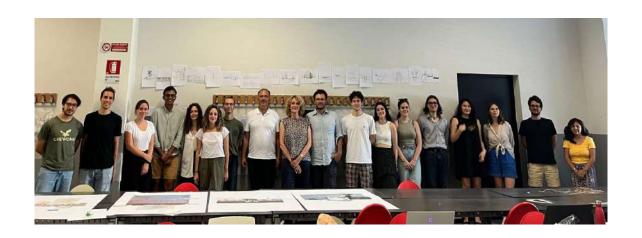
with 54 A0's representing a 7-day journey of 18 master students through "Milano Verde 2050"

Michiel Riedijk and Juliette Bekkering



A photographic storyboard





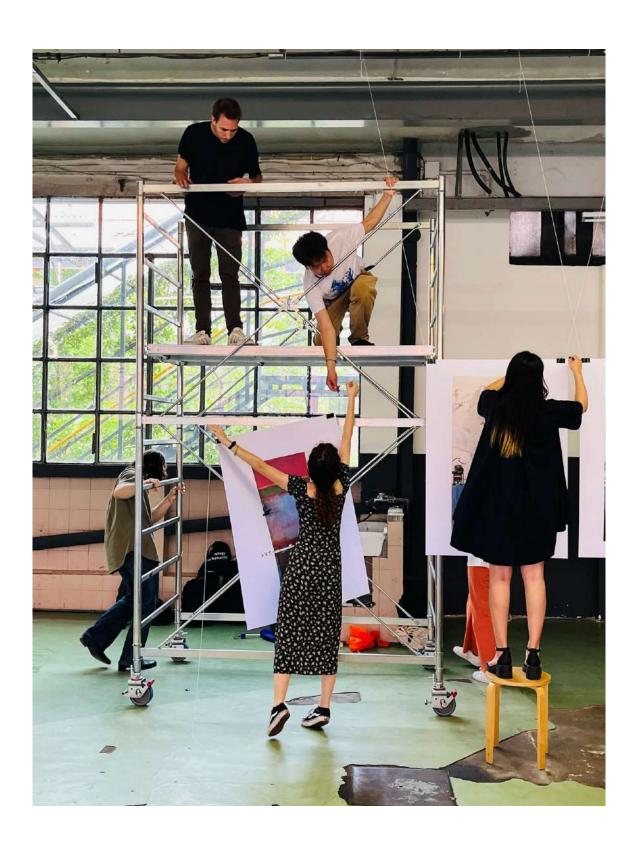


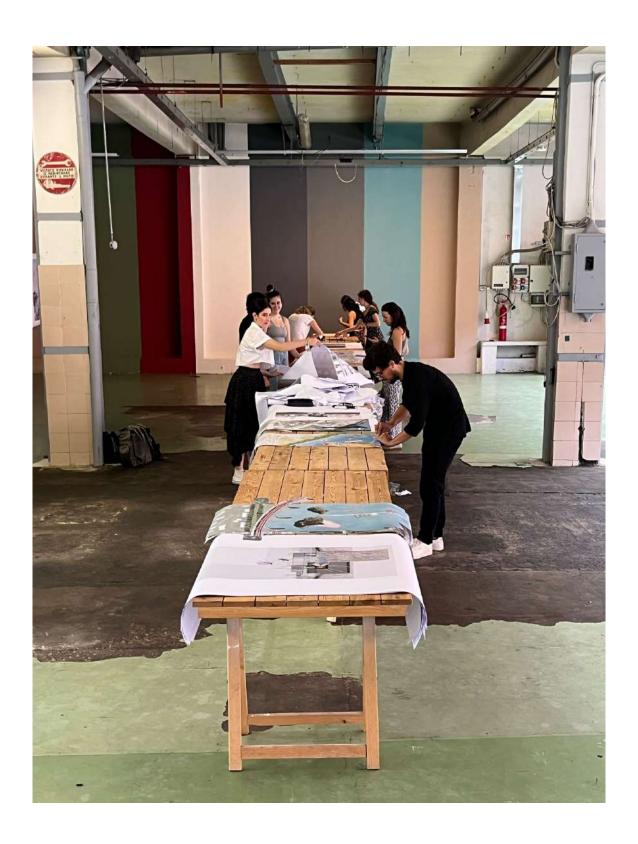


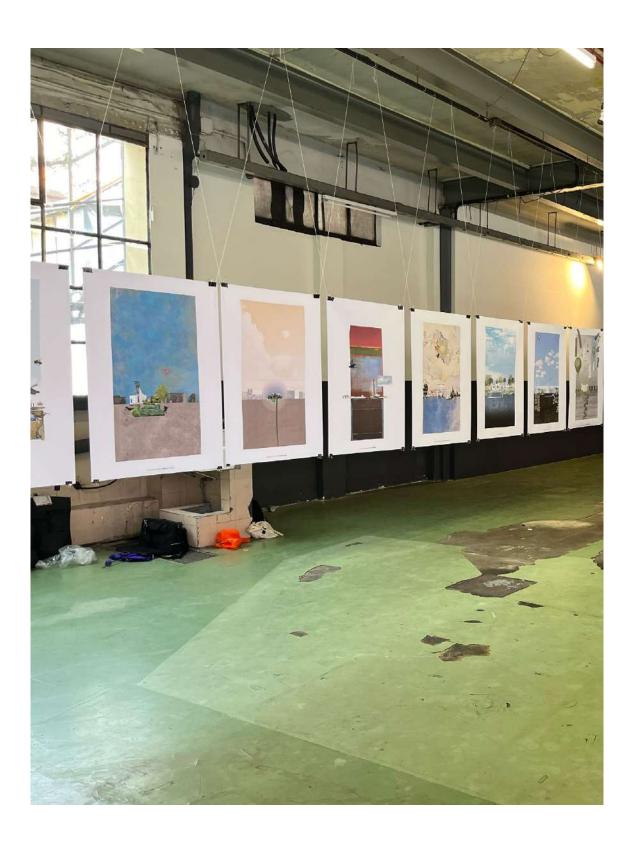






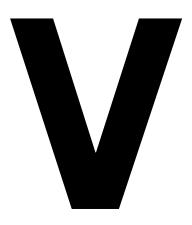




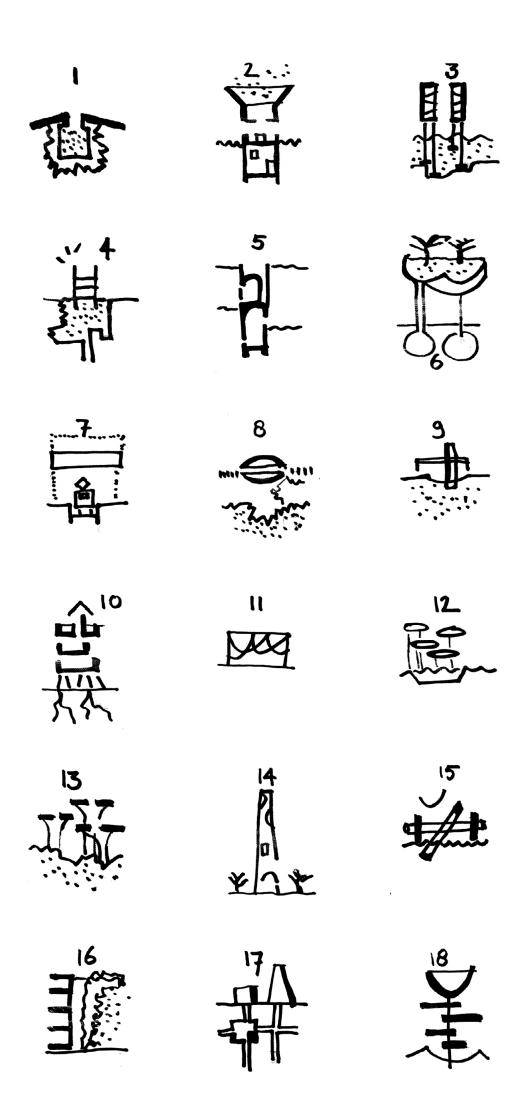








**Projects of students** 





# **Seed power**

In the near future, Milan will implement a progressive policy to limit the use of automobiles due to high pollution levels. This measure is crucial to improving air quality and public health for its citizens. As part of this project, public transportation will be significantly enhanced, making it more efficient, accessible, and sustainable.

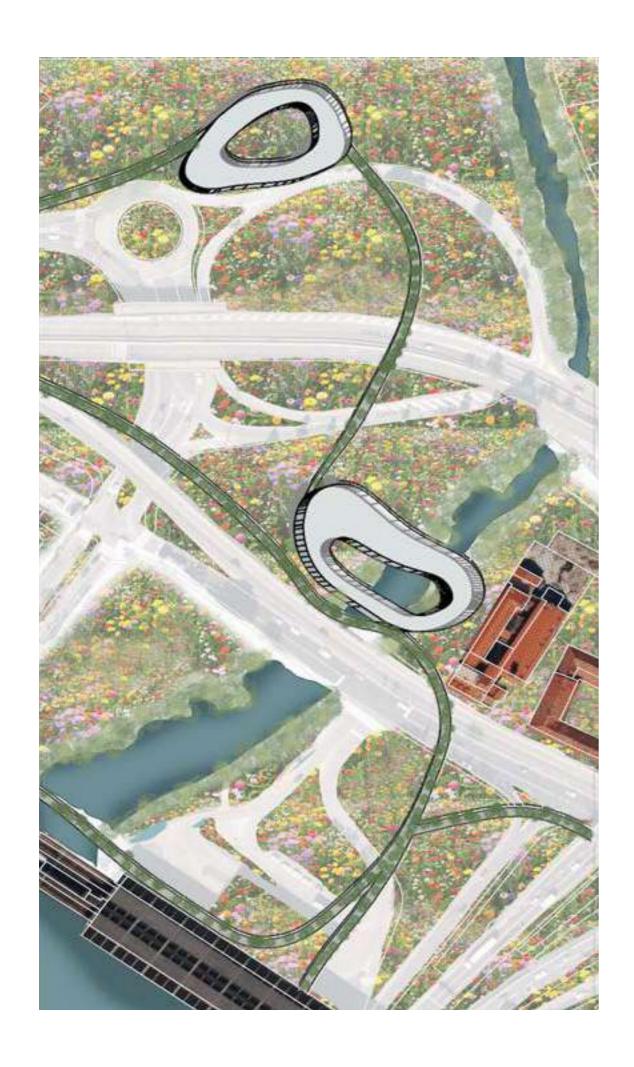
New urban pathways will be created to facilitate connectivity within the city, prioritizing pedestrians and cyclists.

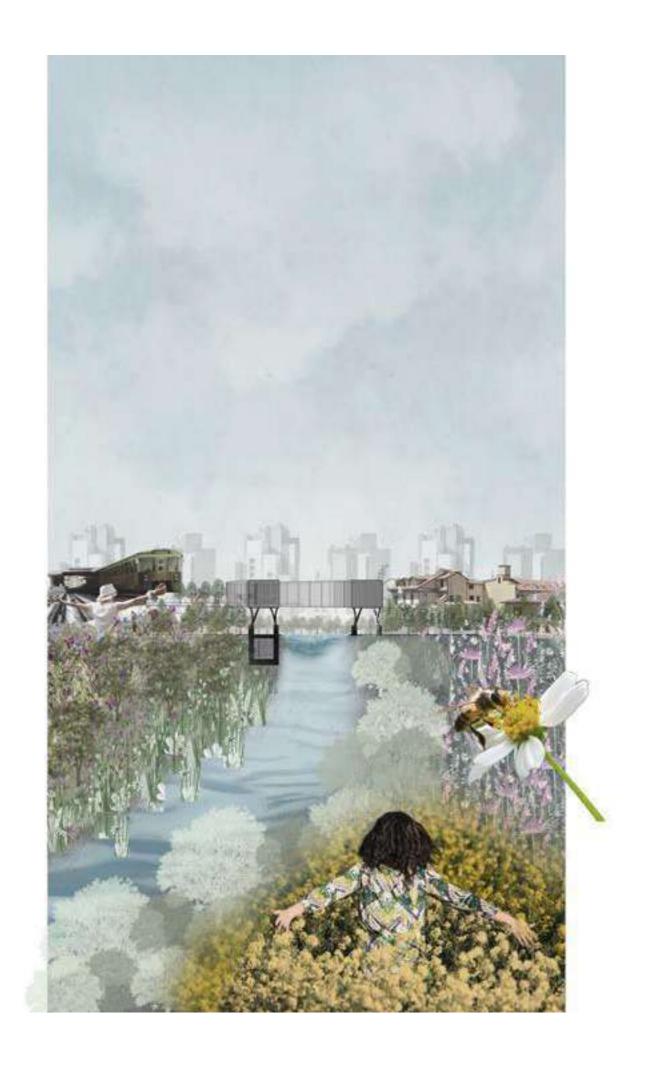
One of the most innovative aspects of this plan is the integration of natural environments into the urban fabric. Pathways will be developed to allow people to walk and commute near fields and wildflowers. This approach will not only improve connectivity between different parts of the city but also provide health benefits, as exposure to nature has been shown to strengthen the immune system and reduce stress.

To support this vision, a seed bank will be established to ensure the diversity and sustainability.



Sharen Delgado









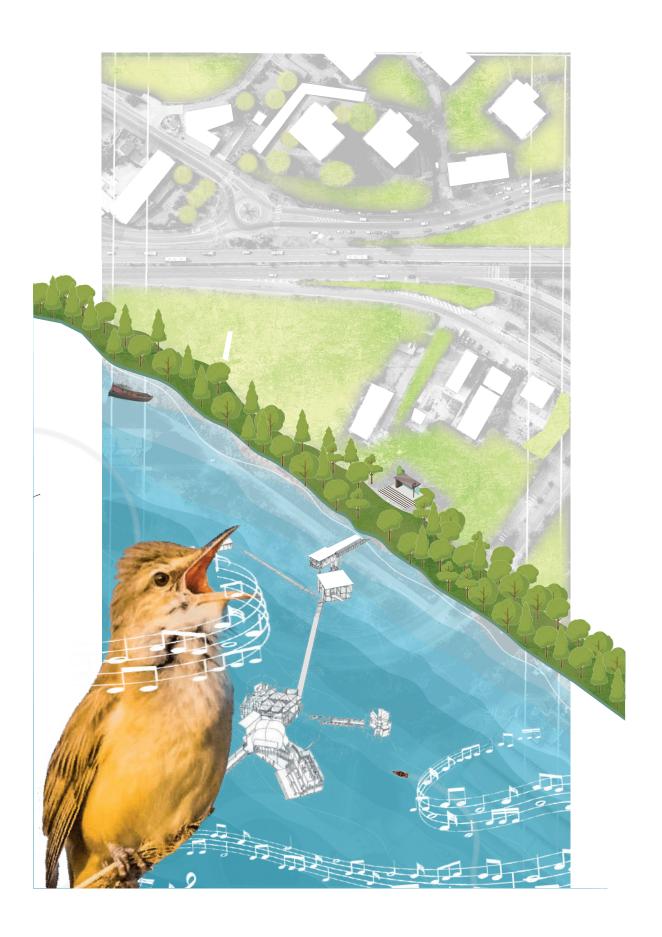
### **Animal Towers**

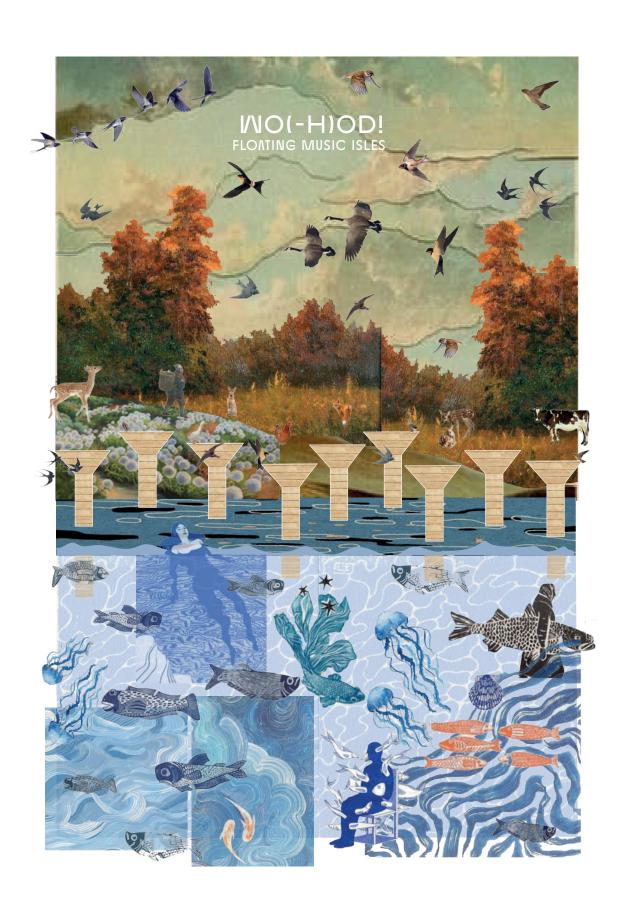
In 2050, Lake Lambro has transformed into a wild sanctuary, with human presence being very rare and the area becoming hostile to humans. The lake features a series of floating wooden buildings interacting with the elements of water, earth, and air. These structures metaphorically resemble caves, providing sanctuaries for animals inaccessible to humans.

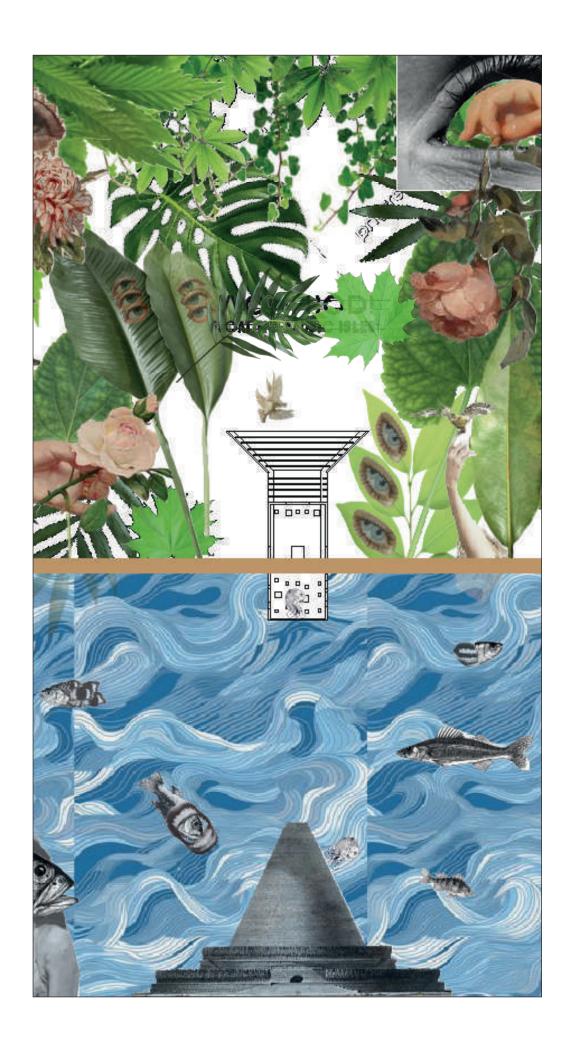
Humans can only observe from a transformed green strip, once a metro line, allowing them to watch and listen to the wildlife. The lower level of these buildings is designed for aquatic animals, offering spaces for them to hide or establish homes. The central level provides a secure, enclosed environment for land animals, akin to a primitive cave, offering protection from the elements and other animals, with a water hole available. The top level is dedicated to flying animals, featuring shelves around a cone-shaped roof for nesting, which also amplifies the sounds of birds and other wildlife.



You Qi Wang









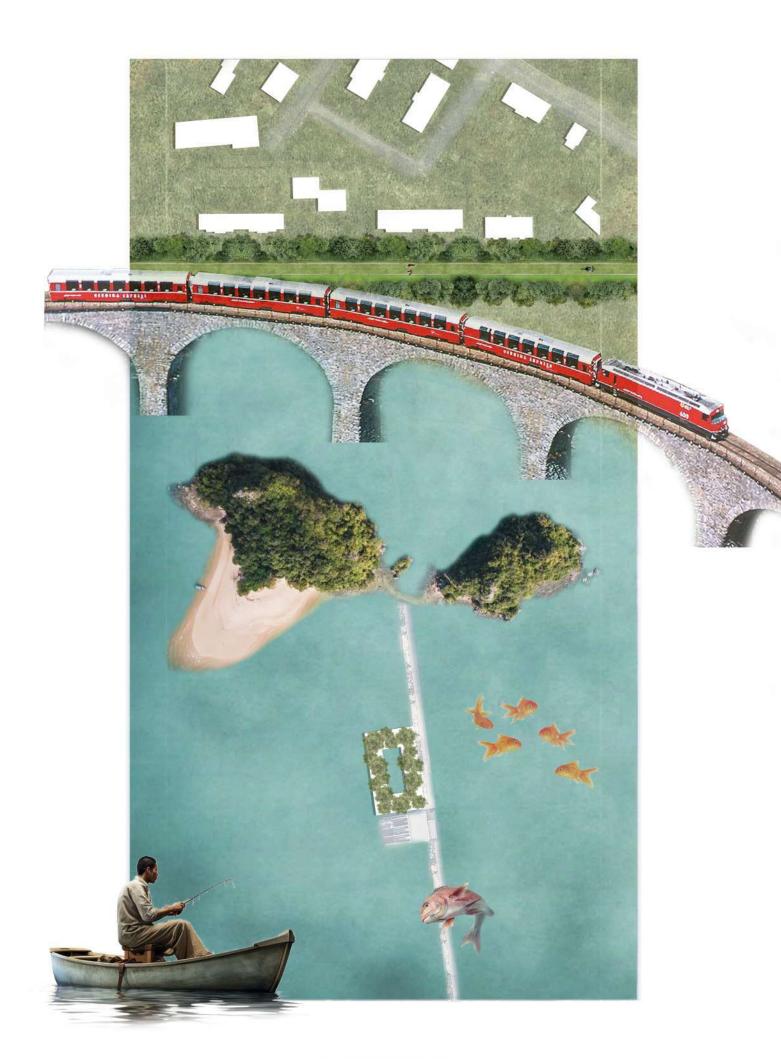
# Floating Labs

To promote a sustainable future for Milan, nature will play a more prominent role in urban life. A new lake will be created at the southern edge of Via Palmanova, incorporating the Lambro River. The existing metro line will be preserved as a primary transportation mode, anticipating a significant reduction in car usage. One hundred trees will be planted near the metro line to slow water flow. Some plots will become small islands within the lake for public enjoyment, though they may submerge during heavy rains.

A "house of biodiversity" will be established near the existing power plant, featuring a central open atrium connected to the lake. This building will offer laboratory spaces for Milan's residents to explore the impact of human actions on nature. The rooftop will feature an open-air greenhouse, where trees and plants will grow over the metal structure, creating a green island within the lake when viewed from above.



Gaia Ghidoni









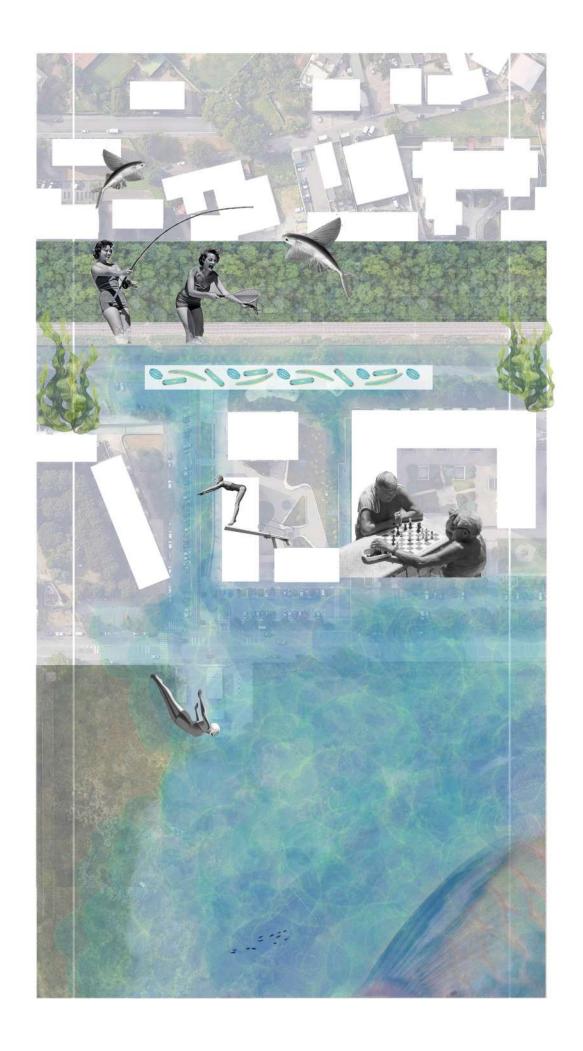
## **Urban Filter**

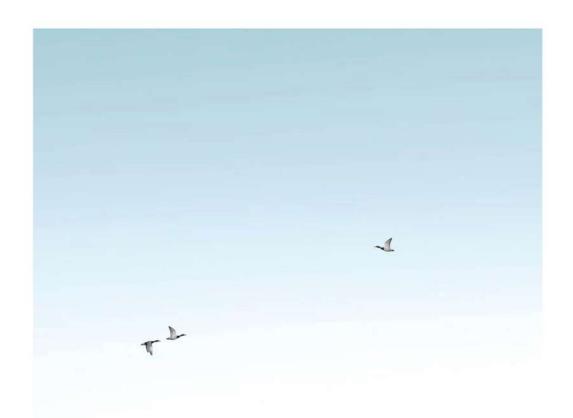
Milan, 12th July 2050

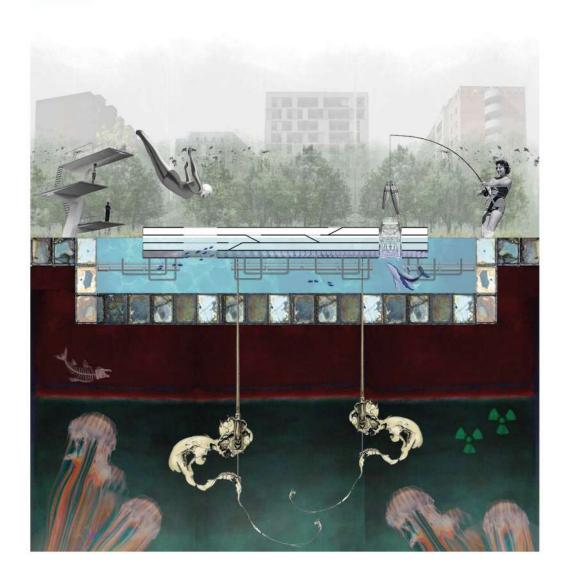
The water inundating the streets will be collected and purified through a filtration line within the new channel, making it potable and suitable for aquatic life. The building, designed with bioclimatic principles inspired by lake and river ecosystems, features multiple layers. The submerged lower level collects and filters water through microalgae, improving air quality. Above this, a sand layer continues the filtration process, creating a habitat for small animals. The upper level offers spaces for swimming and fishing in clean water, while the roof serves as a solarium for relaxation. This complex system establishes a new microclimate and integrated landscape where animals and humans coexist harmoniously. The project transforms a potential problem into an extraordinary opportunity, creating a sustainable and vibrant urban center. It becomes the focal point of community life and a model of ecological and urban innovation, enhancing water and air quality.



Diana
Tortolato











## **Walled Oasis**

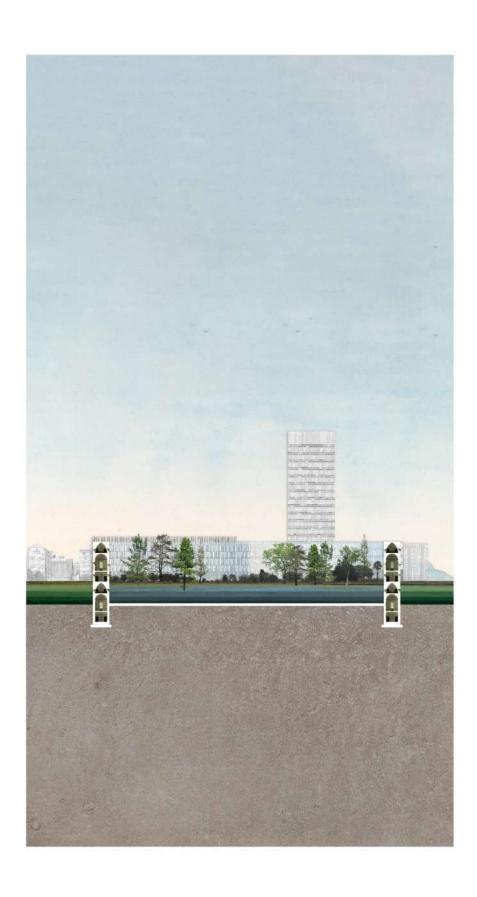
The study area is located on the threshold between the boundary of urban expansion in the Crescenzago area and the Lambro river landscape. The vision for Milano Verde 2050 proposes a scenario of regeneration of the river landscape, turning the Lambro into an artificial lake and renaturalizing the eastern edge of via Palmanova.

In this context, the project is conceived as a walled enclosure that protects an idealized landscape from external conditions. An oasis within a wild lake landscape. Rain and lake water is captured and stored in the perimeter walls to be redirected and used in the interior water gardens. The conception and protection of the oasis becomes an affirmation of a value of Milan's society in 2050, a sign of the humanized landscape's resilience to conditions linked to climate change.



Juan Pereyra







# **Above the Platform**

By 2050, Milan is projected to be overpopulated, leaving minimal space for animals to live undisturbed. This project envisions an elevated forest accessible exclusively to wildlife, including birds, insects, and small urban animals. Simultaneously, this platform benefits the city's residents by generating renewable energy, offering shaded areas underneath, and collecting rainwater. The harvested rainwater will be stored underground and utilized as a fountain in a public space, helping to mitigate the urban heat island effect.



Maria Gaia Cicconi









# **Biodiversity's Measurement**

In 2050, we all imagine a sustainable Milan, rich in parks and free from traffic.

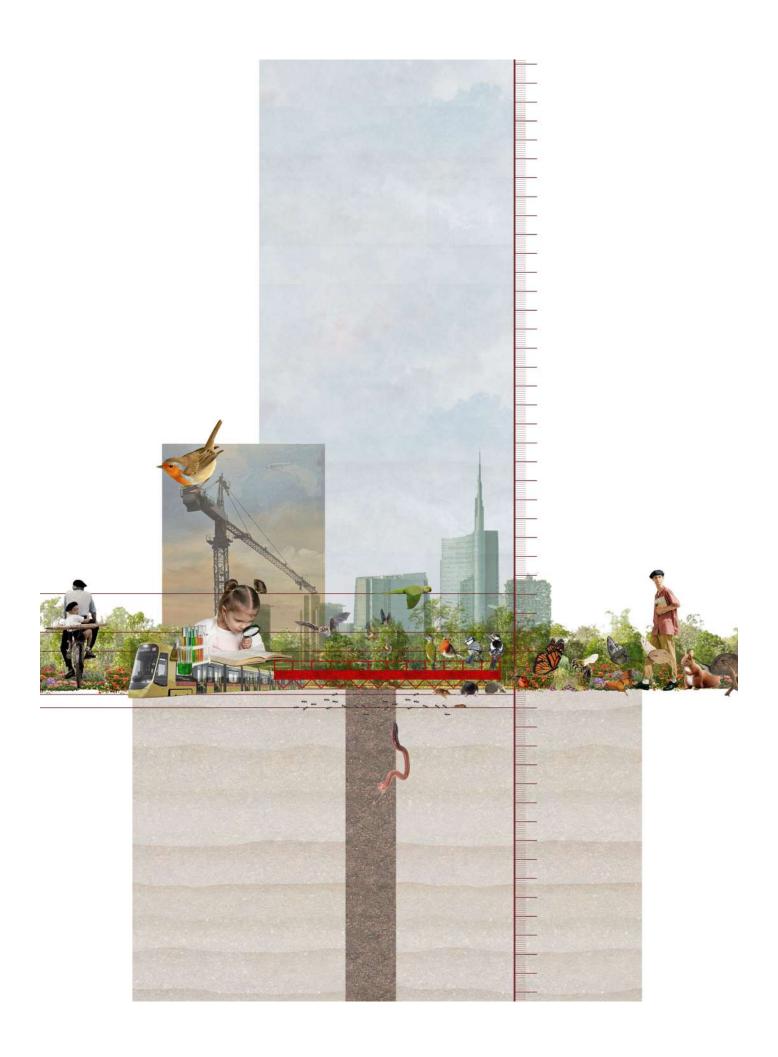
Moving exclusively with public transportation not only reduces environmental pollution but also significantly frees up space: streets can become linear parks connecting the city's green areas. This is the case for Via Palmanova, which will be transformed into a linear park connecting Piazzale Loreto to Cascina Gobba. To ensure that this intervention increases the city's biodiversity, it's not enough to simply plant trees. It's essential to consciously choose the most suitable plants: flowers and aromatic plants attract insects, shrubs provide shelter for small mammals, and taller trees are ideal for bird nesting.

Thus, safeguarding biodiversity requires a deep understanding of it. For this reason the project includes research laboratories aimed at educating new generations about biodiversity, because only by raising aware citizens, we can hope for a better future.



Beatrice Varini









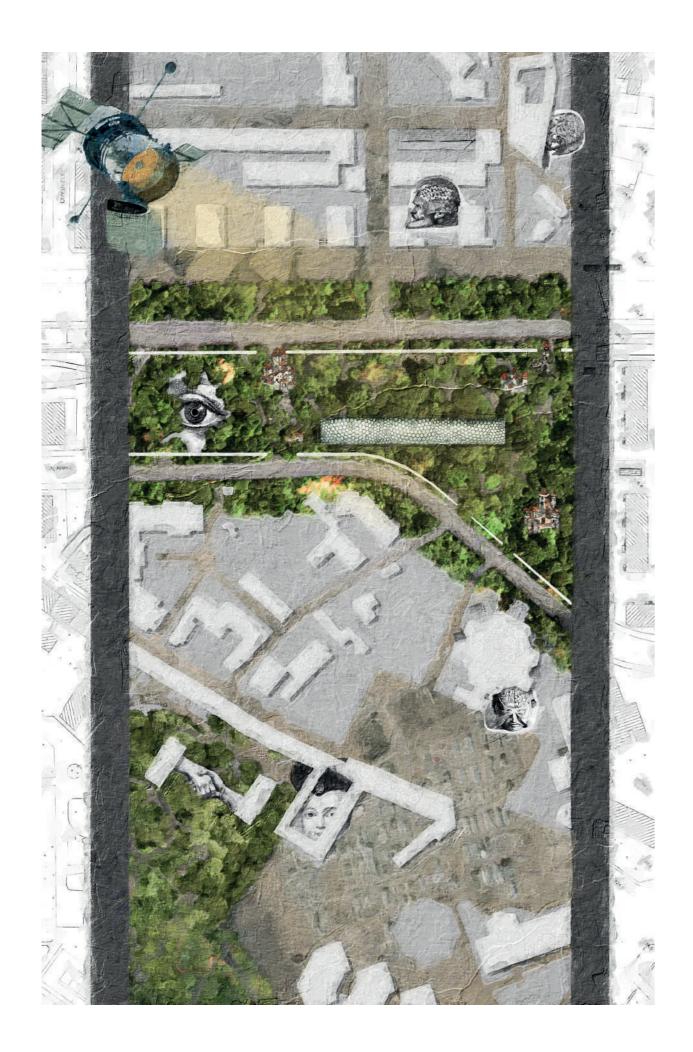
### Architecture for the End of the World

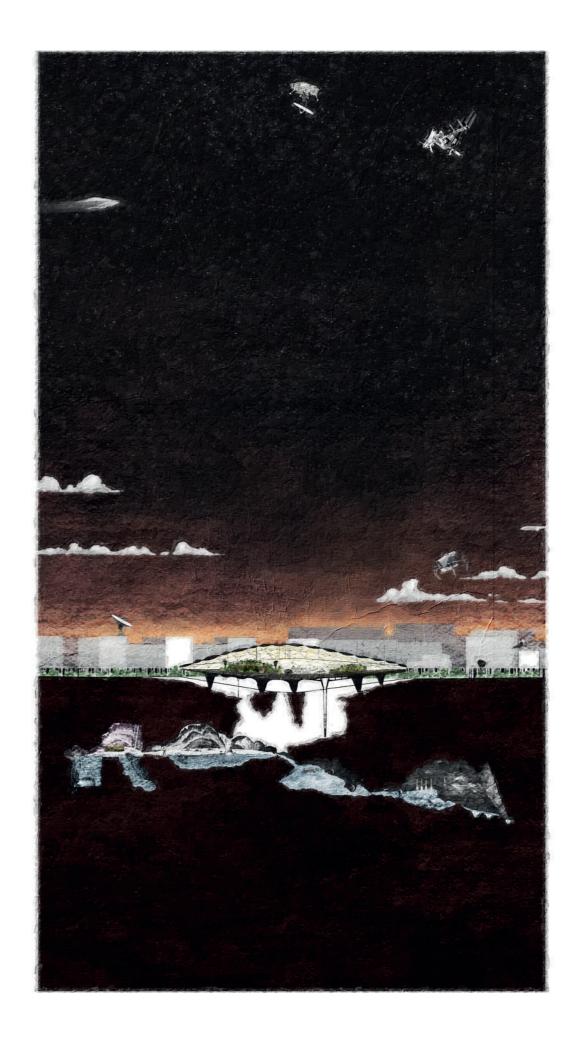
### Bubble of life #593

Plant, refugee, ark. A built frontier to keep the decreasing population of Cimiano and its last guardians sane. A city-supporting factory in charge of producing food and fears, maintained for the sight of the city as a reachable heaven, and hidden by the eyes and the mouth, an enormous complex of crops, cattle, and medicine. It showcases the great technological power of humanity to preserve all the planet's ecosystems within 120 meters of length, while at the same time, being a monument to barbarism and inherited terrors of time.



Jose Suarez









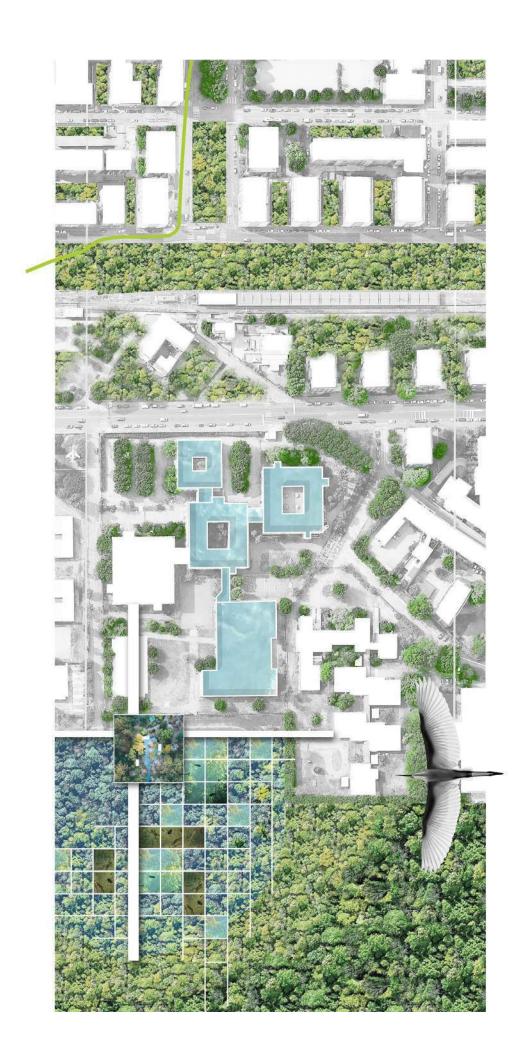
# **Wetland sanctuary**

### Milan, 29th July 2050

I woke up today, thrilled about my first day in the laboratory. Known as Wetland sanctuary, it is dedicated to conserving and breeding rare species of wetland flora and fauna amid the threat of global warming. It is housed in my old school building. The part of the building now stores and purifies rainwater, essential for keeping the wetlands moist during droughts. The lab's core is suspended above the wetland on three gigantic wind towers. Long bridges connect it to the city. Stepping in, I marveled at the richness of the nature and the humid breeze.



Mariia Nakonechnaia



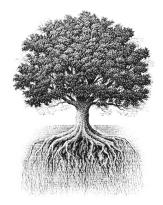




# Milan 2050: Urban Rewilding

Milano Verde 2050 envisions a sustainable and biodiverse city through sys- temic changes to the urban fabric. This plan aims to combat climate change and enhance natural reserves by transforming unused impermeable spaces and built environments into green areas. The proposal includes implement- ing greenhouses, urban farms, native gardens, and rain gardens, among other greening typologies. These interventions will rejuvenate, restore, and reclaim lost biodiversity, ensuring a balanced natural ecosystem within the city. By en- forcing these changes, Milan aims to create a harmonious integration of urban life with nature, fostering a resilient and green future.

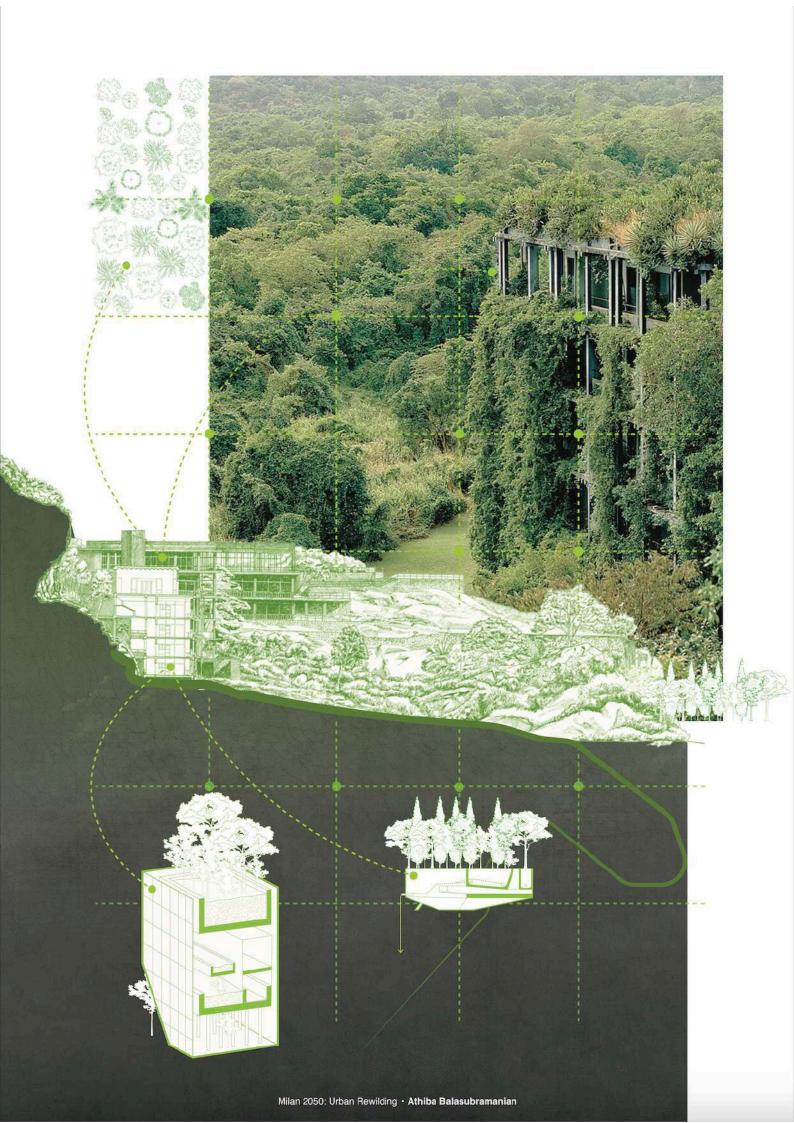
Infiltrate - Transplant - Expand



Athiba Balasubramanian









# Insect cage

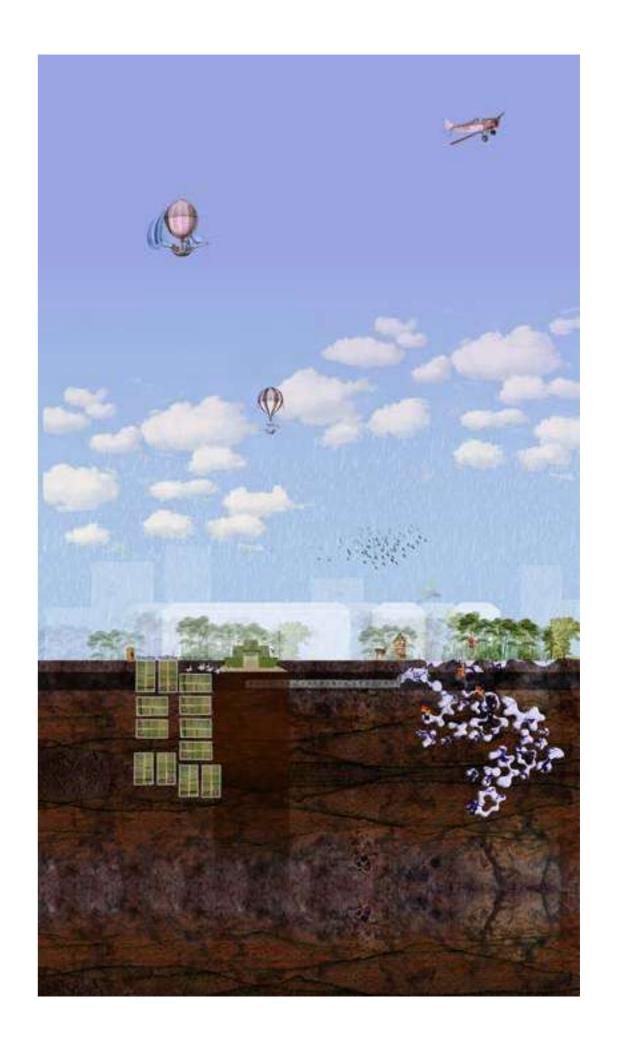
Milan, 12th July 2050

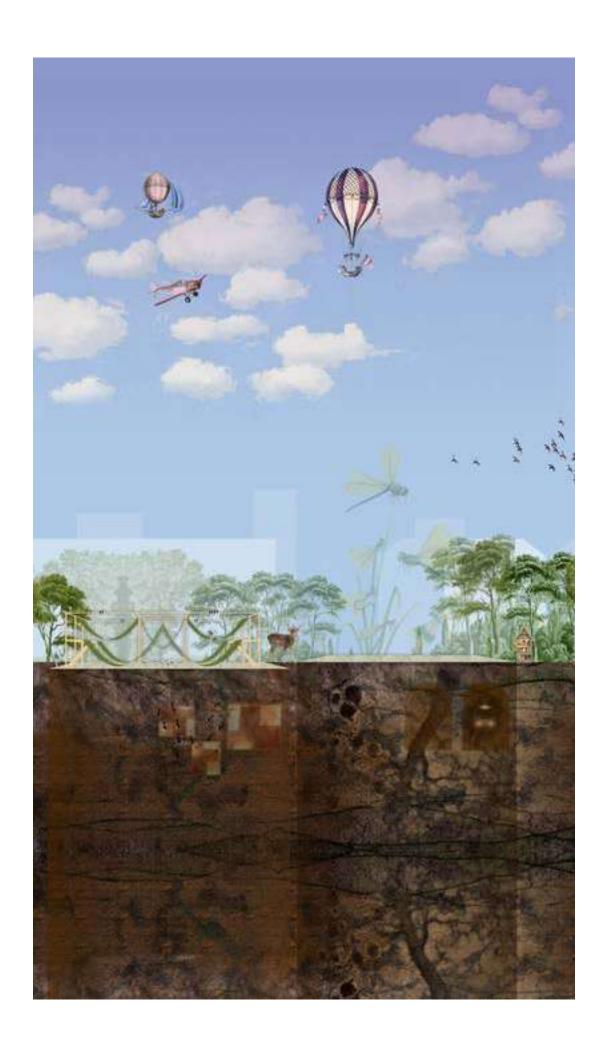
The urban transformation project of Viale Palmanova envisages a linear park that connects Piazzale Loreto to Cascina Gobba, which intersects with another vertical axis that connects Parco Lambro and Parco
Martiri della Libertà Iracheni Vittime del Terrorismo to create a connection between these two currently
independent ecosystems. Small-scale interventions such as urban gardens and insect houses are also
being considered, as well as a wooden insect pavilion. The pavilion acts as a tool for the regeneration of
urban greenery and as a key element in promoting the conscious use of the territory and the management
of green space within the city. By promoting biodiversity and offering educational opportunities, the project aims to improve the urban environment's ecological balance and aesthetic appeal.



Francesca Sordi







### **RainCatchers**

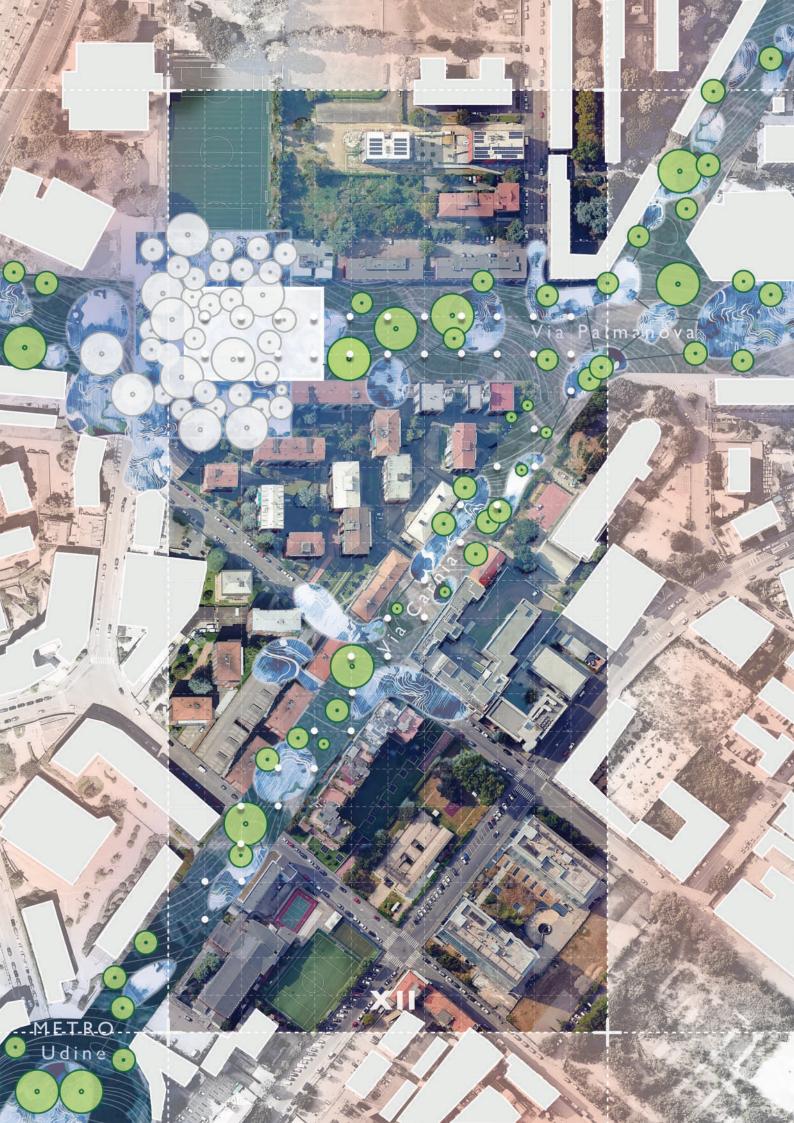
Upon opening the window, a cool breeze floods my room, accompanied with the symphony of birds chirping, and children joyously splashing and dashing in the ponds. RainCatch Oasis was once again alive with the sounds of summer.

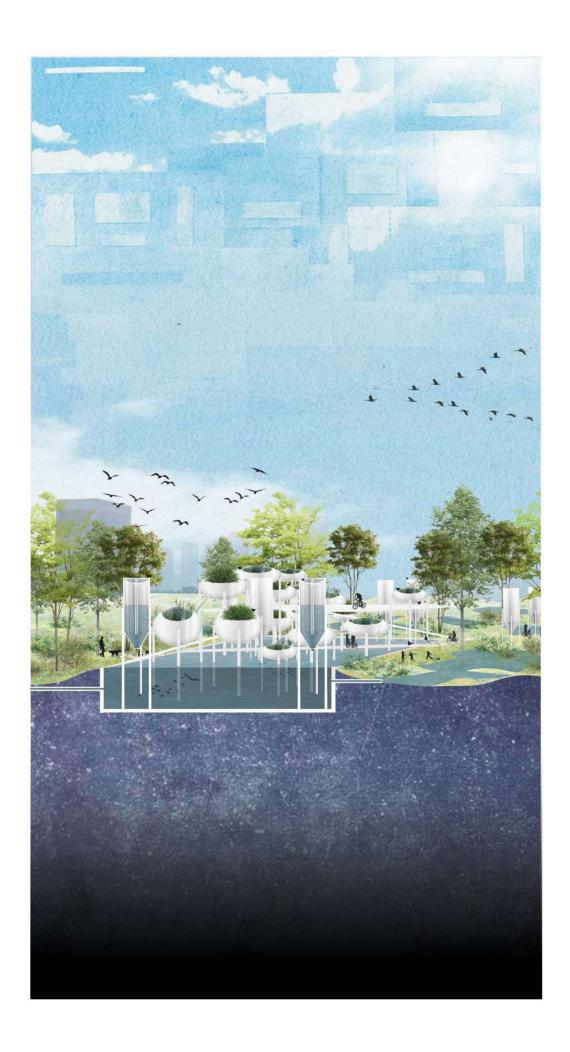
The scent of blooming flowers and fresh rainwater filled the air, mingling with the distant aroma of espresso from a nearby café. I watched as sunlight danced through the cascading water features, creating prisms of colour falling on the surrounding urban surfaces. The intricate design of the garden, with its interwoven paths and hidden hooks, provided a serene retreat amidst the bustling city.

Not much has changed, the paths of the garden followed my childhood memories, the sounds, the smell, and the people. It was just a Saturday. But nonetheless a special one.



Yue Tam







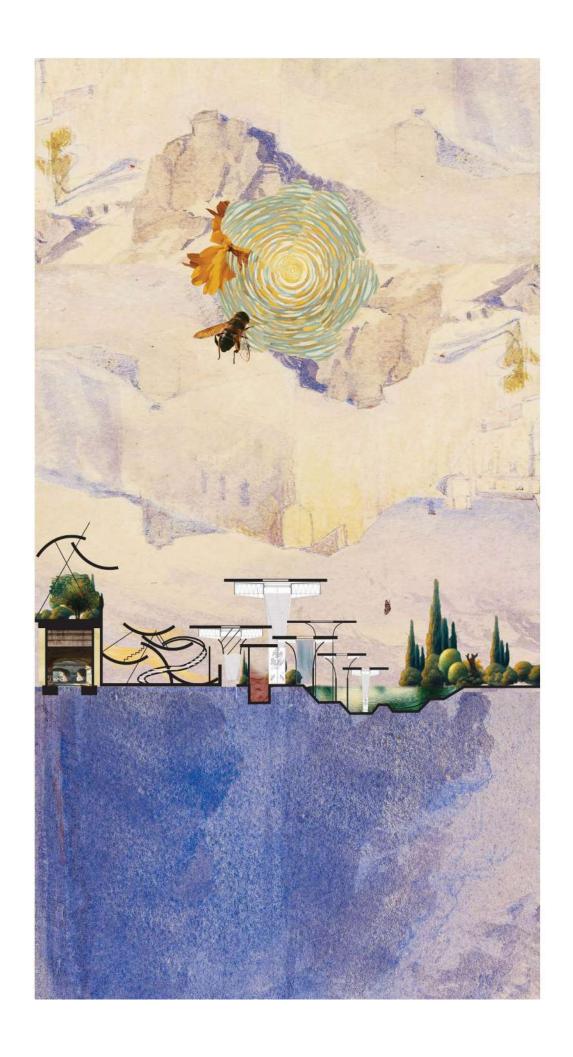
#### **Hotel for bees**

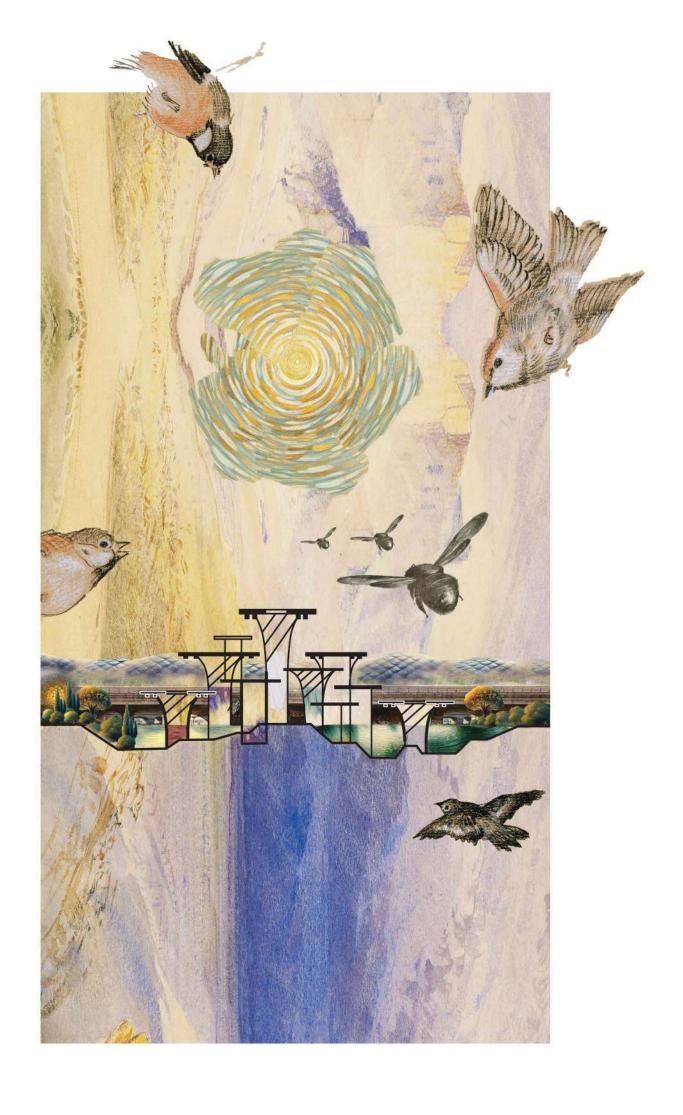
For my vision of Milano 2050, I designed a hotel for bees to help restore and enhance urban biodiversity. This artificial mountain situated within the new park where now is the station for the buses, provides a space for bees, birds, little animals and different species to have a shelter to protect from the harsh weather. The bee hotel holds a variety of nesting cavities tailored to different bee species, made from natural materials such as bamboo, wood, and clay. Additionally, the structure of each "umbrella" is in different heights and is surrounded by terraces to offer a different atmosphere for the different needs of each family of animals throughout the seasons. The design also includes spaces for people to study this new ecosystem with its biodiversity.



Mario Francisco Pantoja Rosero







### **The Weather Tower**

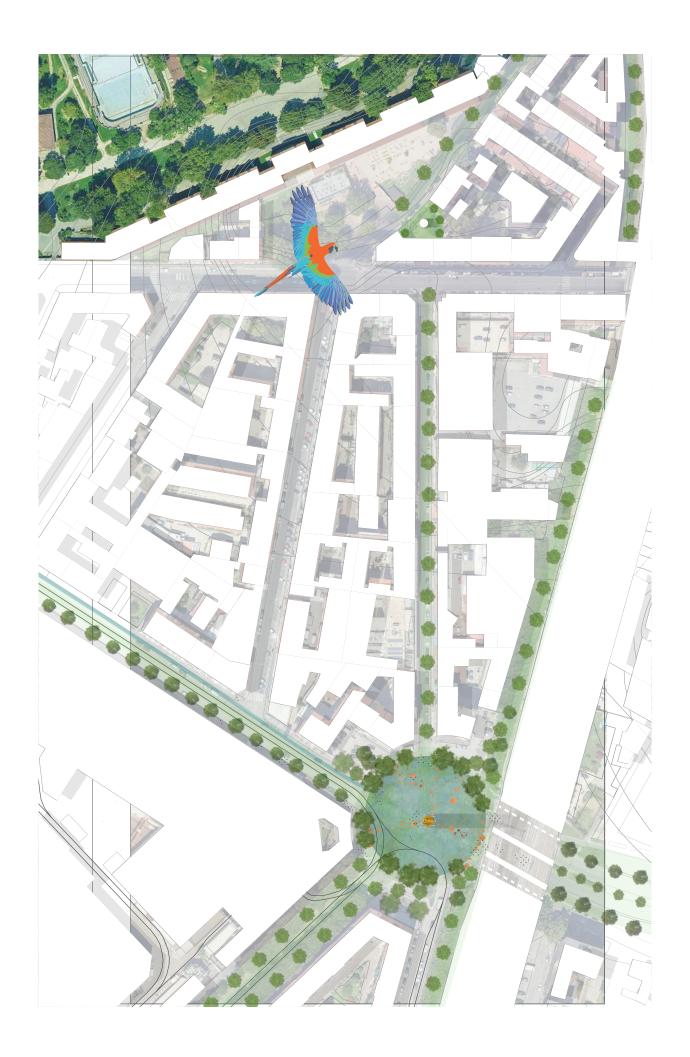
Piazza Sire Raul is turned into a new gate to the city of Milan. In a climate shaped by global warming, architecture acts locally to combat the urban heat island effect.

This project uses the typology of the tower to layer multiple functions: a weather station, rain-water collection, wind channeling, and nesting spaces for various birds. At its base, a vaulted space covers a fontanile, bringing the ancient Roggia Acqualunga back to life.

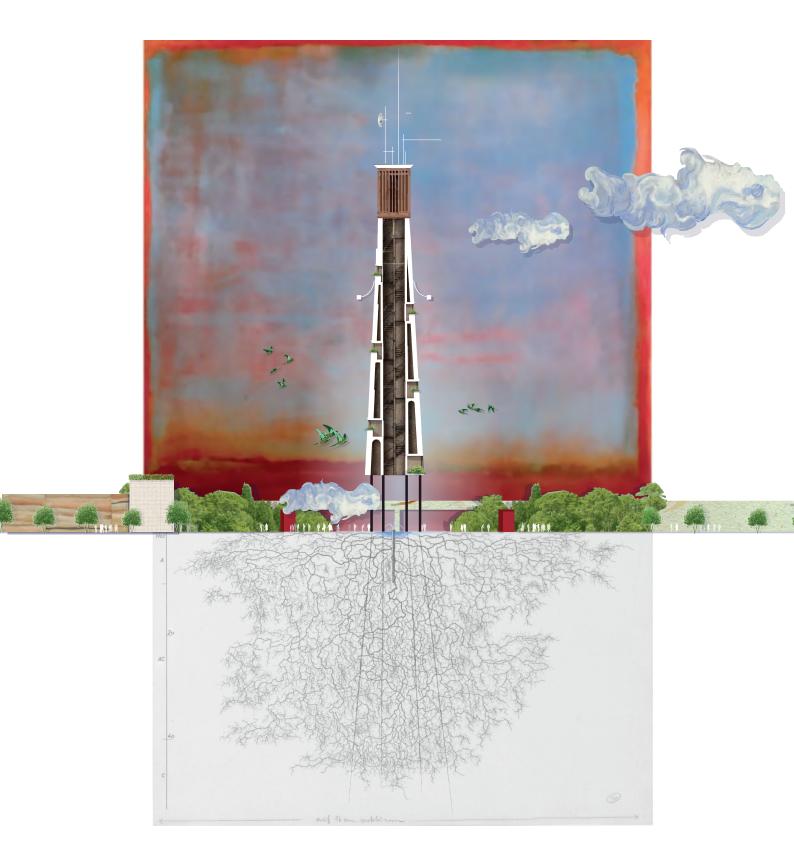
A new landmark for the city. A new public space to gather. A new space for biodiversity.



Marco Frassetto





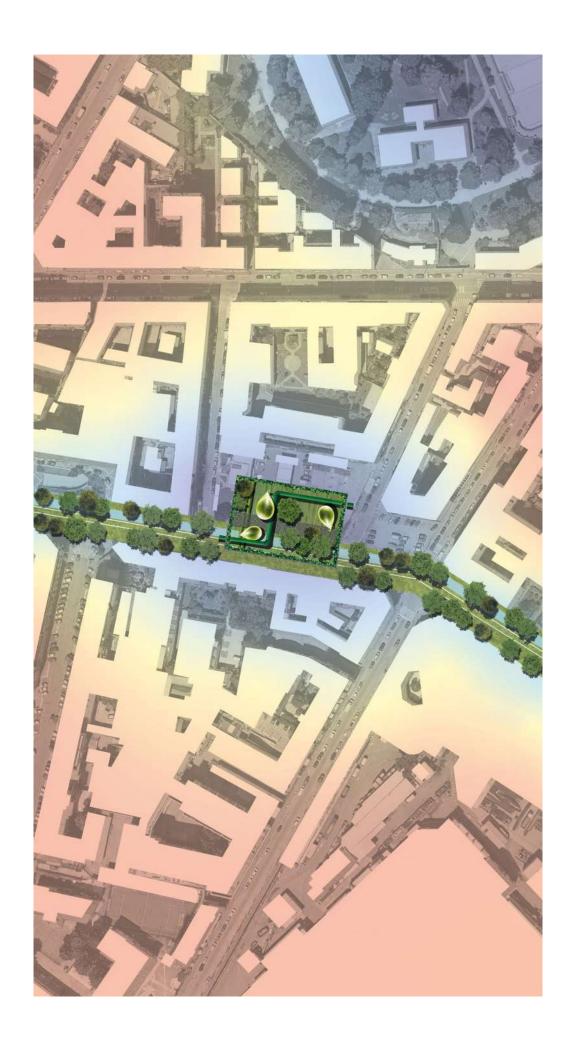


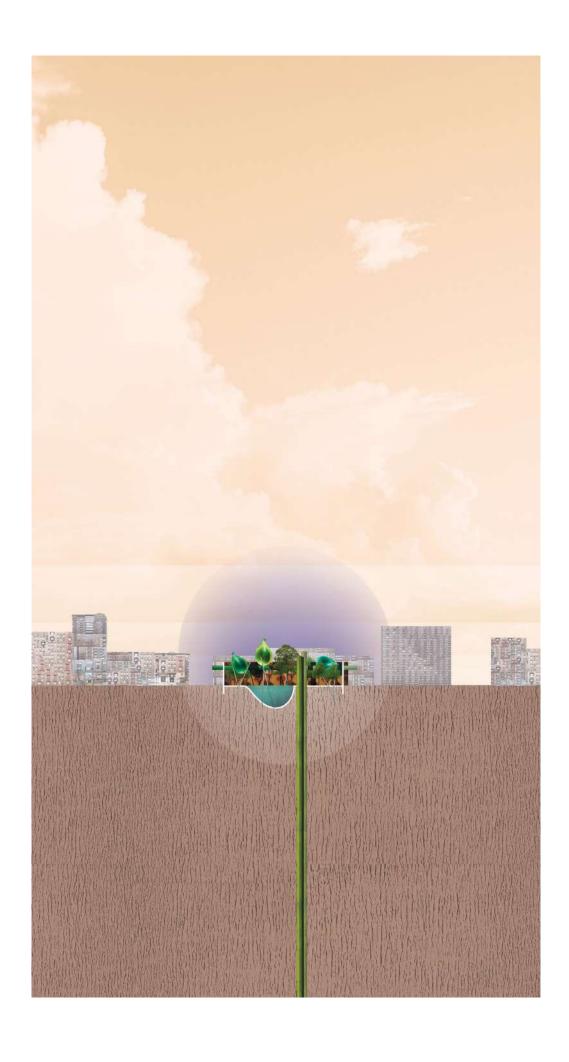
#### Secluded Garden

Between the 1960s and 1970s, Richard Morris profoundly influenced the word of art with the creation of Nonsites, bringing nature into exhibition spaces. This is the premise of the project, a box that is placed within the urban fabric of the Milan of 2050, enclosing a garden. However, the intention is not to recreate a natural landscape within the city, but an interpretation of it, just as Morris did. Mentally projecting into a future affected by climate change and increasing population, the Secluded Garden works as a place where natural elements coexist with the presence of machines for the production and management of energy resources. On the one hand, therefore, the building works to store water in special tanks, to produce geothermal energy for the neighbourhood, to cool the air to combat heat islands; but also to house living organisms such as trees, birds and insects. Therefore, the project proposes an integration of nature and technological innovation for the future of the city.



Francesco Zavoli







#### The House for Bats

It's July 12th, and like every evening, I'm coming home late from the office (sooner or later I quit this job).

The sun is still high in the sky but a pale red color; it too seems to be struggling with this heat.

Last night here in Milan, it poured rain, and all the basins are full of water. At least the greenery is now lush after all these weeks of dryness. I'll eat something leftover from lunch, a bit of fruit, and then I'll go straight to bed; I'm too tired.

Moreover, the air conditioning is broken here in the building, so I'll have to keep the windows open; otherwise, I'll die from the heat. I just hope the bats here in the square have done their job, and I don't find myself awake at 2 a.m. because of the mosquitoes.



Marcello Danelli







## **Impluvia**

Milan, 12th July 2050

After the increase of the temperature, due to climate change, people decided to change radically their behaviour towards the way of living Milan.

Private cars remains now outside the city, and only public transports are allowed.

The environment is now the key of our lifestyle. People works daily to improve the conditions in which we live in.

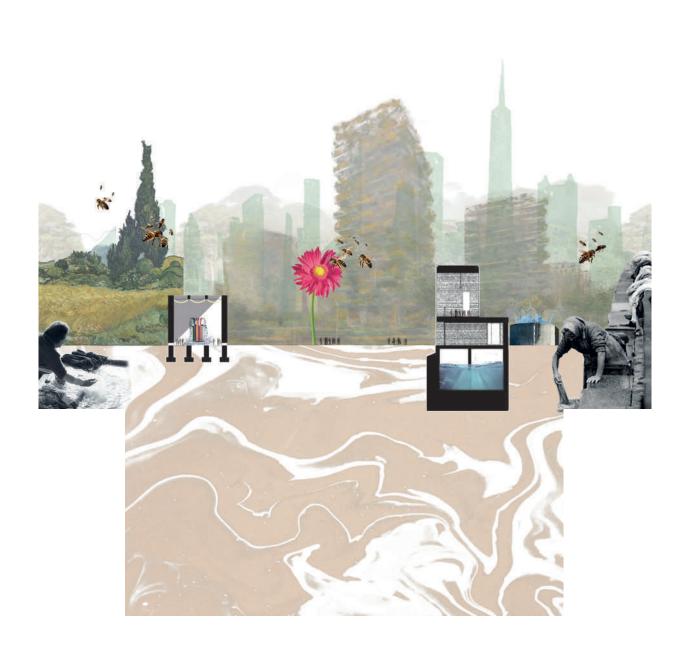
Water-bee is infact one of this improvements: with its water tanks for rain-water gathering, it helps in collecting and storing in underground basins enough water that then it's filtered, pumped up and use by everyone freely to drink, wash, water the vegetation that now is growing again in the city. It waters also the flower-tower, a biodiversity system that provides thousands of flowers for helping bees and bumble-bees to pollinate the other green areas and make the ecosystem stronger.



Sara Raffaglio







#### The Flooded Tower

The Flooded Tower Project is located in Piazzale Loreto, which will be mainly pedestrian by 2050.

The project includes several key initiatives aimed at enhancing the urban environment and promoting sustainability. First, a multiplication of public green surfaces is proposed, which will increase the amount of green space available to the public in a vertical way.

In addition, this tower will be a support biodiversity by creating habitats that support nesting for local birds in Milan, contributing to the conservation of local wildlife.

Furthermore, a rain-catching and purification system will be implemented to manage water resources more effectively. This system will collect rainwater, purify it, and make it available for various uses. Finally, the project relates with the ground floor in form of a floodable public square, designed to manage excess water during heavy rainfall, thus preventing flooding and ensuring the safety and resilience of urban infrastructure.



Paola Nicolacci









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Thanks!

Juliette Bekkering and Michiel Riedijk

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