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Urban Greening

Readressing a Mechanism for sustainable cities:
Rotterdam and Torino

Politecnico di Torino

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A heartfelt thanks to the people who supported us with their unwavering support and encouragement during the completion of our thesis

Family, friends, mentors, and those closest to our hearts.

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Urban Greening
Readdressing a mechanism for sustainable cities: Rotterdam and Torino

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abstract | EN

The thesis critically deals with Urban Greening, a phenomenon that transformed contemporary urban areas in the post-industrial landscape. After a deep exploration of literature field fieldwork, this research defines such an issue as “an accumulative mechanism of translation of the perception and relationship between society and urban nature”. By inquiring greening mechanisms in the cases of Rotterdam and Torino, the work proposes a design experiment to challenge the current ways of production of green bodies, by fostering new relationships in the urban sphere.

The first part of the thesis defines urban greening through literature, contemporary definitions, and categorizations. Aiming for a redefinition of the concept by means of the deconstruction into its main components; society, nature, time, and interactions. The research directly moves towards a better understanding of what greening and nature can mean, by confronting the ideas of some significant authors, such as Matthew Gandy, Phillippe Descola, and Lucilla Barchetta, among others.

The exploration understands the relevance of greening as a term that has gained momentum in the past few decades, with the decline of the post-industrial landscape and the increasing degradation processes of the Anthropocene. However, the general approach, wishes to go beyond the contemporary notions of greening, as one of the promises of the so-called “sustainable city”, and explore the constructions and narratives that have constituted its meaning throughout time.

The second part of the inquiry takes two contemporary cities as case studies: Rotterdam and Torino. By analyzing their greening history and urban expansion, to later take a look at the modern-day panorama in terms of administration, governance, and policies around green infrastructures. Moreover, confronting this greening agenda with the projects that will shape the future of Rotterdam and Torino, assessing their reach, coherence, and implementation in terms of the sustainable city. As a result of the case studies exploration, the thesis draws a series of considerations that suggest new types of relationships around urban greening.

The last part of the study wishes to challenge current ways of urban greening, by experimenting with a form of planning that drifts apart from the objectification of green elements and hopefully tries to integrate spontaneity in urban relationships.

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0.0
Greening in Contemporary Cites

When taking a detailed look at modern cities, it is inevitable to notice that the urban landscape finds itself in an extremely complex position, particularly, when it comes to the relationship among its main infrastructures, under the effects of the current environmental crisis. In other words, urban bodies are facing countless issues that reveal a lack of balance between the social, environmental and economic dimensions. It is not a coincidence, that precisely these dimensions correspond to the three main pillars of sustainability [1], which seem substantially promising on paper, but rapidly fall apart in the real life implementation of the so-called “sustainable city”. Given this preamble, the research has inevitably approached the many different topics that concern the construction of the sustainable city and the emerging issues that revolve around it, such as the inedible mark of the Anthropocene [2], the reconstruction of the post–industrial landscape, Green Gentrification, Green Washing, Ecological justice, among others. Some of these first ideas that initially came up as random topics and discussions, subsequently shaped the final course of the investigation. Ultimately, arriving to the definition of Greening as the main research topic, revolving around the different hypothesis of its evolution in terms of urban nature and its relationship with the city.

1. The three pillars of sustainability are the environmental, social and economic dimensions.
2. “The Anthropocene Epoch is an unofficial unit of geologic time, used to describe the most recent period in Earth’s history when human activity started to have a significant impact on the planet’s climate and ecosystems”. Definition retrieved from: National Geographic Website, encyclopedic entry: https://education.nationalgeographic.org/resource/anthropocene/

As the research approached the concept of Urban Greening, its several definitions started to reveal its complexity. Even though, it is a word that has been strongly used to shape the vision of the future city, its several definitions rarely seem to embrace the potential and influence of Greening as a phenomenon of urban transformation and physical translation. These definitions limit themselves to interpretations strictly related to modern ideas of sustainability and the “Green City”, mostly focusing on its functional and technological potential, leaving aside its social, cultural and historical connotations. As exposed in the book *“La Rivolta del Verde”*, the modern conception of urban green, has been reduced to functional spaces solely destined to satisfy the needs of its users, hinged on an anthropocentric semiotic of space, still defining contemporary urban green practices (Barchetta, 2021, p. 98).

“We are used to think of parks and gardens in cities as disconnected spaces, in which objects and people move on the basis of an idea of comfort understood as the product of the combination of activities, but only those that are socially accepted, by the routine uses of places, by the division between private and public, and by a predefined and sweetened idea of livability. We continue to treat nature as if it can only be injected into cities in the form of parks or green roofs and other aesthetic artifacts”. (ibidem)

In this sense, it is essential to question how modern and single conceptions and speculations of green elements in the city can be reduced to dominant narratives, created by the urban greening orthodoxy [3], instead of considering local perspectives and needs of vulnerable minorities, within the complex environmental condition of the urban fabric. Even as green urbanism continues to transform the city, it neglects the position and sensible connections in a local, social, and equitable level, more over increasing the disparity between narratives and accessibility to green spaces which Anguelovski, Connolly and Brand define as the “green gap” [4], ruled by dynamics of exclusion, segregation, and invisibilization of vulnerable species and communities.

3. “In urban planning, the green orthodoxy traditionally assumes the social and health benefits that individuals experience as well as the environmental and ecosystem benefits through pro-green development narratives and land development agendas and often utilizes democratic engagement to open up new green urban frontiers”. (Anguelovski, Connolly and Brand, 2018, p.5)
4. Defined in Anguelovski et al. (2018) as: “The green gap emerges when land deemed vacant, underused, or contaminated is identified by developers as a possible area to be ‘greened,’ generating amenities that may allow for higher economic value and profit accumulation”.

Under this vision, the thesis proposes to approach the phenomenon of Urban Greening with a different perspective, hoping a more sensible and deeper understanding of the role of green bodies in the generation of the sustainable city. For such a purpose, and under the influence of substantial authors like Matthew Gandy, Phillippe Descola and Lucilla Barchetta among others, the investigation sets the post–industrial landscape and the anthropogenic climate as crucial points in the comprehension of the complex scenario that constitutes the production of green.

Within this framework, the investigation deals with the definition and the notion of Greening and its origins under the premise that even though it is a relatively modern term, the practice of Greening has been taking place all throughout history, and it is intrinsic to the social construction of the city. With this clarification, the study proposes to start from a simple deconstruction of the concept of greening, depends on the interactions among the elements.

This abstraction is crucial in order to understand the general structure of the work and ultimately the final definition of Greening proposed by the thesis. However, the main idea behind this deconstruction, is to understand that it is not possible to study Urban Greening processes without considering the basic components of the equation, in which the evolution of the idea of Nature plays a decisive role in the generation of green infrastructures. Moreover, it is the ongoing relationship and interactions between Nature and Society, under the influence of Time, that fundamentally set the course of Green developments in the urban landscape. Under this reasoning, the main research question:

How do current ways of Urban Greening affect contemporary cities, based on the ongoing relationship between nature and society?

To tackle the main research question, the first portion of thesis will answer the question of ***What is Greening?*** First framing its modern notion, as the main production mechanism of the sustainable city, as well as the countless issues that derive from it. In this sense, the attention moves towards the ecological and environmental justice [5], in which the accessibility and interaction with green infrastructures has demonstrated to be unequitable and segregating. Urban Green as an agent of discrimination highlights the unbalanced relationship non only among humans themselves, but with non-human species, as both Gandy and Descola refer to in their explorations.

5. "Environmental justice has emerged as a policy issue for the last three decades. With the growing concern of socio-economic inequality, environmental justice issues are also obvious because of their interconnectedness with socio-economic disparities. It is explicitly observable that socio-economically marginalized people are mostly vulnerable to environmental problems" (Md Masud Parves Rana, 2009).

Along these lines, Gandy refers to the actual relation and effect of human activity and settlements in vegetation generating anthropogenic biomes. Gandy (2021) references plant sociology as a field from which urban botanists have been investigating the relationship between "natural" ecological systems and landscapes modified by human activity. Highlighting the importance of emerging elements in the Anthropocene, such as synanthropic species [6] and new spontaneous human ecosystems such as ruins wastelands, interstitial spaces, and as a consequence conceiving new nature cycles.

With this preamble, the line of investigation inevitably attempts to answer the question of ***What is nature?*** In which the traditional dichotomy of the conception of nature as a *Subject and Object,* unavoidably emerges to explain the ongoing interactions between society and nature. In this portion of the study, the thesis explores a few of the main concepts and common misunderstandings of the huge debate around *Nature*, in order to frame the following passages.

This exploration of the subjetification/objetification of *Nature*, in fact helps the attempt of a categorization of greening. These approach is based on the production of green infrastructures inscribed in a system of interactions between humans and non-humans. Coloring outside the lines of the traditional dichotomy, and proposing a series of subcategories that explain the complexity of the current vision of greening for the contemporary city, has provided a series of tools that allowed the analysis of two cities as real life case studies.

Subsequently the following portion of the thesis explore the cases of Rotterdam and Torino, as cities that have implemented greening as one of their main strategies to evolve from the post–war and post–postindustrial landscape. Furthermore, as contemporary urban bodies, these two case studies have a strong vision for new developments of green infrastructure and the achievement of the sustainable city, that will be revised accordingly to the theoretical framework. Moreover, the selection of these particular case studies, is driven by personal motivations of the authors of this thesis, given that each one has spent a discrete amount of time living in this cities for professional and academic reasons.

6. Reference to the inquiry on Matthew Gandy´s: Natura Urbana: Ecological Constellations in Urban Space. Used to define species that derive from the term Synanthropy: "refers to undomesticated species (plant or animal) living closely alongside and benefiting from human beings. Synanthropes exist across a wide range of taxa including plants, insects, birds, and mammals". (Synanthropy, Amy R. Klegarth, 2017)

Wishing to carry out a thorough analysis of the case studies, the explorations begins with a history of greening processes for each one of them. Rapidly transitioning to the revision of the main policies and governance, that shape the present and future urban landscapes. Later exploring the future of green though a series of future projects in each one on the cities, in which the coherence and implementation of the policies will be evaluated. The idea behind a meticulous analysis of each one of the cities, is to expose the crucial challenges and issues that emerge from the existing ways of developing green. But furthermore, the thesis wishes to reveal new and unconventional approaches that could go beyond the traditional objectification of urban nature, or the conservationist approaches that inevitably separate humans from natural infrastructures.

In this order of things, the project section of the thesis proposes the recognition of the production of *urban greening as the main mechanism of transformation, in response to the environmental and social crisis, with a specific emphasis on the future landscape.* Furthermore, understanding two main elements in the evolution of green from a dynamic perspective: the temporal dimension and the types of relationships between the city and nature. As it follows, the final portion of the thesis wishes to challenge traditional urban planning around green elements, from the perspective of planned spontaneity, giving space for new urban exchanges to happen and relationships with wild urban nature to emerge. For this reason, the research develops a final experiment with a series of imaginaries, based on the concept of *Non-Planning*, proposed in the article "*Non-Plan: an experiment in freedom"*, published by the *New Society* magazine in 1969. Under this perspective, the imaginaries will redefine the limits of traditional planning, and set a departure point for greening processes to emerge in the context of planned spontaneity and the search of equitable urban relationships.

"Take a walk along a city's paved arteries and stumble across a botany of concrete. Look for cracks in the sidewalk, the thin gaps in-between the iron rods of gutters, the dry, gravelly soil of abandoned lots, the seams along the edges of buildings, or spaces along the road and train tracks. In the fissures of the city's built structures, nestled between slabs of concrete, you will find a world full of surprise. And if you are lucky, you will catch a glimpse of a small tree pushing its way through the concrete, breaking its surface, reaching skyward. Its dark green, palm-like leaves gently brush up against a wall. Follow the tree, and it will tell you a history of the world that is more than human". (Pg. 82)

The Botanical City by Matthew Gandy

Image 1: **Sections of the Anthropocene** - *designed by Future Green Studio*
Location: New York / New York City / USA / Type: Installations / Built: 2019

Cap 1.0
Urban Greening

1.1. What is Greening?

The Rhetoric Behind the Urban Green

As the thesis approaches the discussion around Greening as the main topic of exploration, it becomes evident that the variations and inconsistencies among its definitions, present a huge theoretical, historical and anthropological gap, in the comprehension of its true meaning. Under this argument, this section of the thesis attempts to answer to the question of ***What is Greening?*** Or more specifically, What is ***Urban Greening?*** In which the Urban connotation sets the base point on its parallel development with the city and more importantly, with the present notions of the sustainability for the future.

When thinking about the development of the contemporary city, it is essential to understand the relationship between the physical elements that structure the urban environment in relation to the irreversible and increasing effects of the Anthropocene. In other words, recognizing the process of urbanization as a permanent factor in the city becomes fundamental for an honest approach to address the emerging issues of urban habitability. As the article *"Green to gray: Silicon Valley of India"* states in the Journal of Environmental Management of the Indian Institute of Technology:

"Urbanization is an irreversible physical process involving large-scale structural changes in the landscape with an increase in built-up and population densities, thereby affecting the region's ecology and environment" (H.A. Bharath, et al. 2017, p. 1287).

As the process of urbanization transforms the physical environment, the balance of "green" and "gray" elements prescribe the quality and living experience of the urban body, and the social relationships resulting from it.

However, the panorama becomes more complex when considering not only the composition of the city, but also the contemporary issues related to climate change and the emerging urbanization trends they derive from it. Among these trends, the "sustainable development" [7], has become an undeniably leading vision along the lines of new urbanism approaches, first defined by the Brundtland Report in 1987.

From a critical point of view, the sustainable city is conceptually a promising solution to the global crisis, nevertheless, in practice the consequences of its arbitrary implementation may say otherwise. "Despite the rhetoric of sustainable development over the past two decades, the gap between public declarations of principle and implementation of concrete measures remains significant in most cities" (Pacione, 2007, p. 248).

The unequitable accessibility and contradictions that revolve around the sustainable city, start with the initial conception of its approach, promising balance, and equity among its pillars, "Essentially, in seeking to realize the goal of sustainable urban change, societies must aim to achieve a balance between economic, social and environmental priorities" (Ibid.). Yet materializing in an urban reality that rapidly drifts away from the theory.

As the exploration gets close to the rhetoric that has enabled the sustainable city to materialize its vision, it is clear that the promise of technology has overruled any other kind of discourse. The modern day discussions around Greening in the city are structured by a set of terms, that have supported its practice at any cost, giving the impression that inclusivity and natural balance are implicit in its translation to the built environment. The research finds Gandy´s perspective on the rhetoric of urban nature refreshing, in which he exemplifies how the use of certain terms can support an unquestionable development of the "green vision":

"The language of urban nature ranges from the elegiac to the enumerative. Various forms of ecological rhetoric have become ubiquitous in fields such as architecture, planning, and landscape design. The growing prevalence of quasi-technical monikers such as "green infrastructure" or "ecosystem services" betokens a confluence of concerns with air quality, flood control, urban resilience, and other environmental challenges. The term "resilience," for example, has been described by the geographer Bruce Braun as a specific kind of cultural and political *dispositif* (deploying Michel Foucault's apposite term) that signals an ensemble of ideas and practices associated with variants of Anthropocene discourse that hold an underlying faith in the technocratic adjustment of modernity to meet any form of environmental risk" (Gandy, 2022, p. 12).

7. Sustainable development was defined in the World Commission on Environment and Development's 1987 Brundtland report ´Our Common Future` as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs". (Brundtland, G.H. 1987)". Retrieved from the official website of the European Union.

Image 2: **The Nursery.1306 plants for Timișoara -** *designed by MAIO + Nomadic Studio + Studio Peisaj Location: Timisoara, Romania Type: Installations / Built: 2023*

The disparity between the idea and execution of sustainable development becomes more and more evident as the city expands and restructures its wastelands and green infrastructures. Within this context, severe emerging issues start to shape the “post-sustainable” reality, especially in social and environmental terms, creating new debates such as “environmental justice” or more importantly the lack of it, “environmental injustice”.

In order to frame sustainability as the paradox of an equitable vision of the city, it is crucial to analyze the mechanisms used in its physical translation, which in terms of this research, are much more interesting concepts to study from the practical perspective of modern-day urbanization. **In an attempt to counteract against the increasing ecological crisis, sustainable development brought light to the importance of urban green, as the main mean of the production of a sustainable city.** Supported by the Article, “*Urban greening: A new paradox of economic or social sustainability?”*

“Urban green space accessibility is considered as the key to urban sustainability progress, not only environmentally, but also economically and socially. However, previous research rarely considers the latter two dimensions together” (Mengbing Du, Xiaoling Zhang, 2020, p. 1).

Therefore, given the focus of the research, “greening” is coined as the main element of investigation, and is framed as the physical translation of society´s sustainable vision, especially regarding urban development. Furthermore, it is essential to establish the fact that greening, or more specifically greening in architecture, does not always correspond to the fulfillment of the contemporary promise and principles of sustainability, as it has been framed since the departure point of the exploration. As Angelo (2019), critically approaches the concept of greening in real-life terms, in urban literature. “In response to the celebration of greening in urban-environmental policy, critical scholars have thrown some cold water on the enthusiasm by documenting negative consequences of urban greening including increasing property values, the displacement of vulnerable populations, deepening of existing inequalities, and forms of cultural imperialism in proscriptions for the design and use of green space”. (Angelo, 2019, p. 5)

Ongoing Relationships and Temporalities

As it has been established from the beginning of the research, there are four main elements that compose the equation behind the mechanism of Greening: Society, Nature, Time and their Interrelations. However, as monumental as each one of these concepts might seem on their own, it is only when they are put together in an ongoing dialogue, that the dynamics and definition of greening starts to emerge. It is only by considering the temporal dimension of natural elements in the city and their ongoing relationships with society, that greening process can be linked to the formation of settlements and cities all throughout history.

In this order of things, it becomes pertinent to mention some readings that have studied the relationship of the city with the natural (green) elements. Even though, Urban Green can be understood from countless perspectives, one of the most interesting approaches comes from Matthew Gandy in "*The Botanical City"* (2020). The reading emphasizes the tight relationship between the history of botany and the history of urbanization, highlighting the relevance of green spaces in urban living conditions, experiences, behaviors, and perceptions under the influence of the temporal dimension.

"The Botanical City" questions the undeniable relationship between green infrastructures and the social dimension, and particularly how environmental injustice is an intrinsic outcome in the process of "greening" the city, where economic and political factors overrule other dimensions. Furthermore, Gandy inquired about the symbolic character of the plants, gardens, balconies, or any other urban green elements as a reflection of economic power status and position in the social hierarchy, from early developments in the imperial powers to contemporary local plans. "The history of botany and the history of urbanization are deeply entwined. We know that many early cities had elaborate gardens and other complex reconstructions of an idealized nature: plants from distant places were often chosen to symbolize the geographical reach of imperial power" (Gandy, 2021, p. 6).

Gandy´s vision allows a broader comprehension of what "greening" actually means in historical terms, establishing that it is not a simple contemporary element, but an ongoing and transforming construction of the Anthropocene.

A parallel perspective to Gandy´s approach, is proposed by Lucilla Barchetta in her book "*La Rivolta del Verde"*, in which she particularly recognizes the importance of the cultural and social relationships that are constructed around natural sites. Moreover, her perspective of *natural degradation* in former industrial areas and abandoned urban sites, presents an opportunity to rethink modern conceptions in the aesthetics of artificial green, wild urban nature and wastelands.

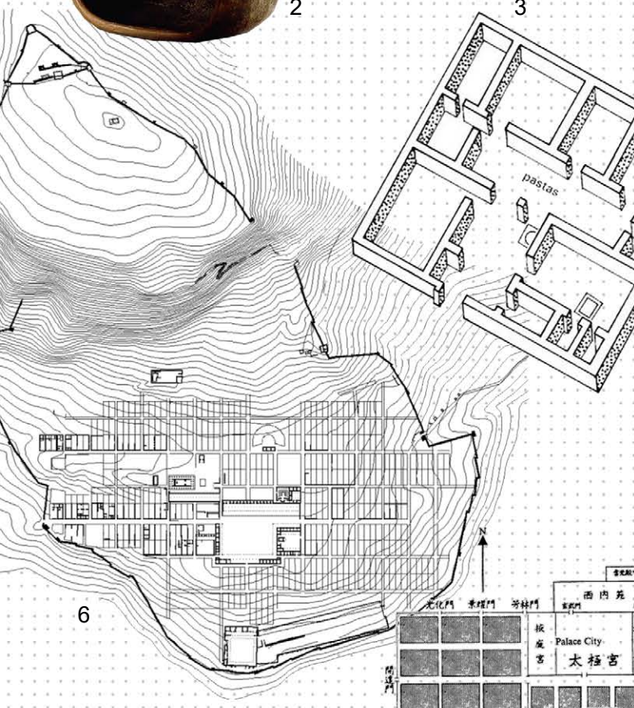
She not only portrays neglected natural elements in the postindustrial landscape as an opportunity to rethink its aesthetical value, but makes a huge emphasis on the importance of the multiple temporalities, historical and sociological heritage that can be contained in a single piece of urban green. "Environmental degradation, argued by urban political ecologists, cannot be fully understood if isolated spatio-temporally from this regime of exploitation, accumulation and the creation of relations of subordination, control and domination. "Digging" and bringing light to this tangle of socio-ecological interconnections is indispensable work to re-politicize environmental processes, often confined to the domain of the natural, as much as highlighting the dynamics that deepen the scissor between rich elites, less poor social strata and the poor" (Barchetta, 2021 p. 98, research translation).

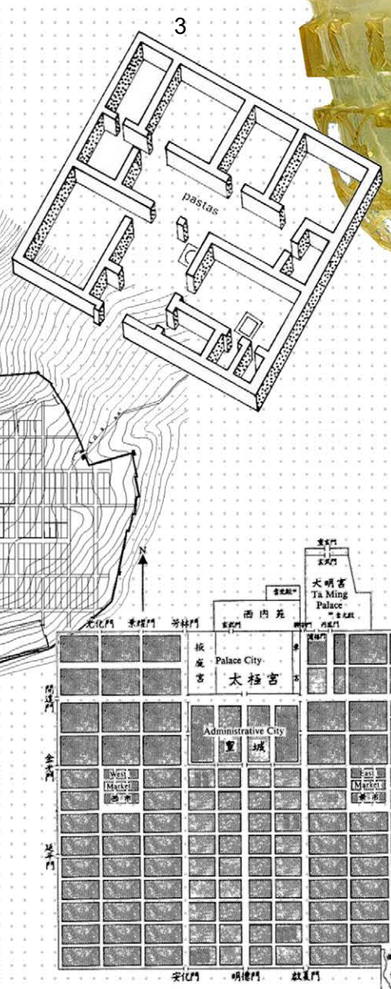
Bringing light to these alternative perspectives, reveals that "urban greening as a mechanism" is a shifting concept that transforms its meaning depending on the context, and cannot be isolated from its temporaties. Presenting itself as a shifting element, rather than a static one, it is suggested that it is actually a construction of the relationships between humans/society and nature and not an agent that can be understood on its own. As E. Bird coins in her article, regarding nature and their interactions, *The Social Construction of Nature: Theoretical Approaches to the History of Environmental Problems:* "Neither human beings – in the contexts of their societies of modes of production – nor nature as a historically emerging process can be understood except through the dynamic, dialectical interaction between them. Drawing on Marx's assertion that the world cannot be understood adequately in the abstract but only through one's interactions, it follows that any attempt to understand nature is precisely one of acting upon "nature" so that it can never be the same from one moment to the next" (Bird, 1987, p. 259).

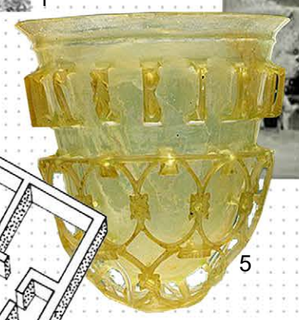
In this section of the study, the thesis recognizes the urge of coining greening as an agent capable of discrimination in regards to the social and environmental relationships, even more when referring to modern visions of artificial green. As the green city rises, discrimination and segregation processes rapidly grow, not only among human society but likewise with non-human species and spontaneous nature.

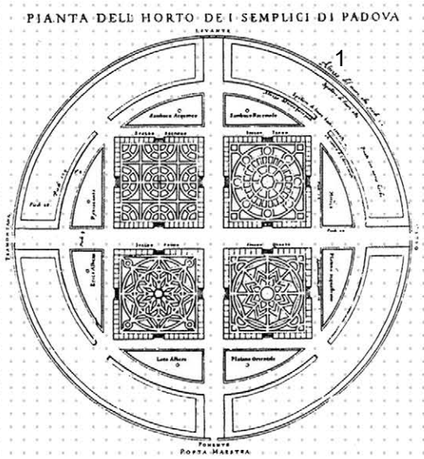
Contemporary Constructions

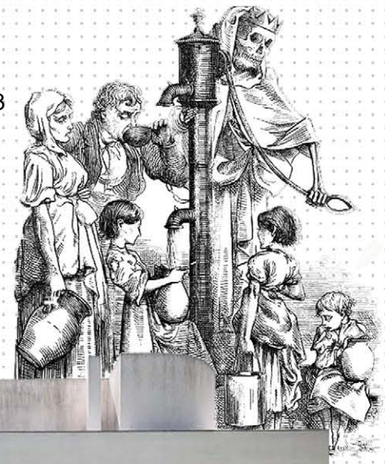
In a modern view, greening can be understood as a mechanism to materialize a response to a need, particularly when viewed from the functional and sustainable development point of view. In this sense, such "needs", can be contemporarily translated into the environmental problems that modern-day cities need to address, moreover, shaping the evolution of green infrastructures.

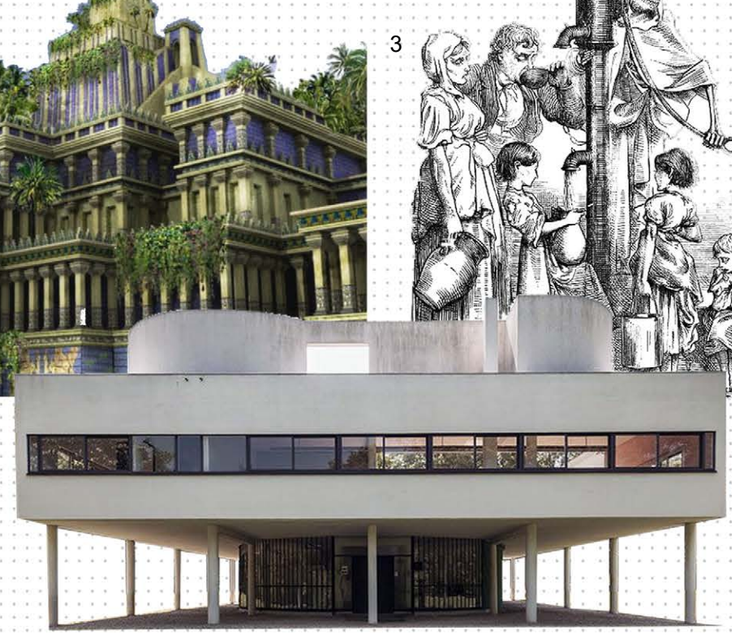












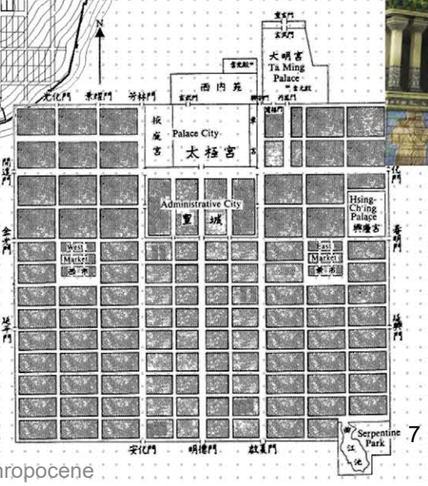


Diagram 1: Greening in the Anthropocene
Illustrated by the authors.

1. Parts of the Greek cities deforested by the 5th century BC as a result of human exploitation for the current ways of heating.
2. Greeks who in order to solve indoor thermal comfort conditions used portable charcoal burning braziers heated with warmth they could collect during the day and using wood as a source material for it.
3. Olynthian house that represented an equitable housing model of allowance to good responsive climatic measures that traced the framework of the early roman urban residence with internal courtyards. Phillip J. (2014)
4. Hyderabad, Pakistan that uses strategies for climate control like wind chimneys as common urban elements that capture outdoor wind currents for indoor air circulation.
5. Alexandria (100 AD), cast glass windows started appearing showing a preference of choice among the european elite
6. The Lonian city of Priene (1000 BC) in the south west coast of Turkey, as an example of urban planning under challenging topology conditions that in addition considered excellent solar incidence reached by means of good oriented streets design.

7. Chinese streets, oriented in relation to the cardinal position convenience and as well in different different geographical locations

1. Orto botanico di Padova 1545 the first botanical garden in the world for the cultivation of medicinal plants, form the thesis "L'archivio dell'Orto botanico di Padova e dei suoi prefetti (1763-1915): inventario analitico, vicende istituzionali e profili biografici." Notolini, Giulia <1991>
2. Bosco verticale Stefano Boeri, located in Porta Nuova Milano- a neighboorhood that offered affordable housing to working class population before the reurbanization of "parco degli alberi"
3. Cholera Victorial liverpool as a breaking point of the process of greening in which the industrial urbanism eliminated the different types of greening in the urbanization process causing problems health problems. Calder B. (2021) "from prehistory to climate emergency"
4. Modern movement pillars as a trial to bring again the greening in architectural design
5. High line, New york Didier scofidio & renfo (2000) "New York's hyper-urbanization and density, as well as the development of luxury amenities like manicured green spaces, have contributed to stark wealth divides." Black K, Richards M (2020)W"Eco-gentrification and who benefits from urban green amenities: NYC's high Line"

Taking into account that the city is, in fact, the outcome of a collective social *imaginary* [1](Castoriadis 1987), (without saying that collective means inclusive), these needs, or unresolved issues, are the result and consequences of previous socially constructed landscapes, that have evolved to generate new challenges in terms of environmental effects. “Our understanding of environmental problems is a social construction that rests in a range of negotiated experiences. To cite the “laws of ecology” as a basis or understanding environmental problems is to rely on a particular set of socially constructed experiences and interpretations that have their own political and moral grounds and implications (Bird, 1987, p.260).

Bird elaborates on the idea that the actual environmental crisis, is to a great measure generated by a set of social operations that have built the modern urban landscape. In this sense, “greening” is the result of accumulative process of urbanization, in a degrading urban environmental picture: “Environmental problems are not the result of a mistaken understanding of nature. Rather they are the result of mistaken (unfortunate or ill-chosen) negotiations with and constructions of nature in the shaping of new socio–ecological ordering of reality. They result from morally and politically mistaken social practices. Environmental problems represent situations in which some segments of society engage in practices that adversely affect other members of society and have the potential to injure the future quality of survivability of the planet”. (Ibid.,261).

1. The Imaginary Institution of Society, Cornelius Castoriadis (1987)

Image 3: **‘African Studies’ by Edward Burtynsky** - *From South Africa to Namibia, 2015*
Human Imprint on African Landscapes

Image 4: Dust: **Exploring the radioactive ruins of secret cities on the Russia-Kazakhstan border**
Nadav Kander - 2011

This perspective of “green” from a social construction point of view, brings light to the core issues in the implementation of sustainable infrastructures, in which the only narratives that shape the green city are the ones in a position of power. As Anguelovski, Connolly and Brand describe the role of the green orthodoxy in the city and their narratives:

“Although green orthodoxy in urban planning presents a seemingly immutable set of goods, this agenda setting occurs within the pervasive development epistemology of advanced capitalism (Brenner and Theodore, 2002). Thus, the negative repercussions of greening more specifically, who will not benefit from the advancement of this agenda, and the role that greening plays in expanding the terrain of how inequality is shaped and exacerbated in the 21st century are all obscured”. (Anguelovski, Connolly, Brand, 2018, p. 421)

As it follows, many of the definitions proposed by contemporary literature, remain in this spectrum in which greening is coined as:

United Nations Environment Programme (UNEP):

"Urban greening involves the incorporation of green spaces and natural elements into urban planning, design, and development to create sustainable, healthy, and vibrant cities."

World Health Organization (WHO):

“Urban greening refers to the creation, enhancement, and maintenance of green spaces such as parks, gardens, green roofs, and street trees in urban areas for the improvement of environmental, social, and health-related aspects of urban life.”

Richard Weller, Landscape Architect and Urbanist:

“Urban greening is the practice of increasing and enhancing the vegetative footprint of the city, whether it’s through parks, street trees, green roofs, or other means. It aims to improve the urban environment’s livability and resilience.”

“The fact that sustainable development is theoretically supported by utopian visions, has given planners and greening the moral authority and economic imperative to become “green(er)” (Anguelovski, Connolly, Brand, 2018), without considering the collateral damage of the green utopia.

Considering the previous arguments, this thesis remains in a critical position in which greening is understood as much more complex phenomenon, than what the contemporary visions describe. It opens an invitation to reflect on the issues and effects brought upon by the dominant narratives that construct green and gray infrastructures in the urban fabric. Moreover, the investigation finds positions and motivations like the one of Lucilla Barchetta much more interesting, from which she challenges contemporary solutions. “What good are gardens and green roofs if, along with the greening interventions of the city, there is no accompanying change in the relationship we have been accustomed to building with the environment and its components? Therefore, our relationships with the nonhuman world, our food systems, health systems, climate, security, are now more than ever in the spotlight” (Barchetta, 2021, p.21, research translation).

New Semantics of Green

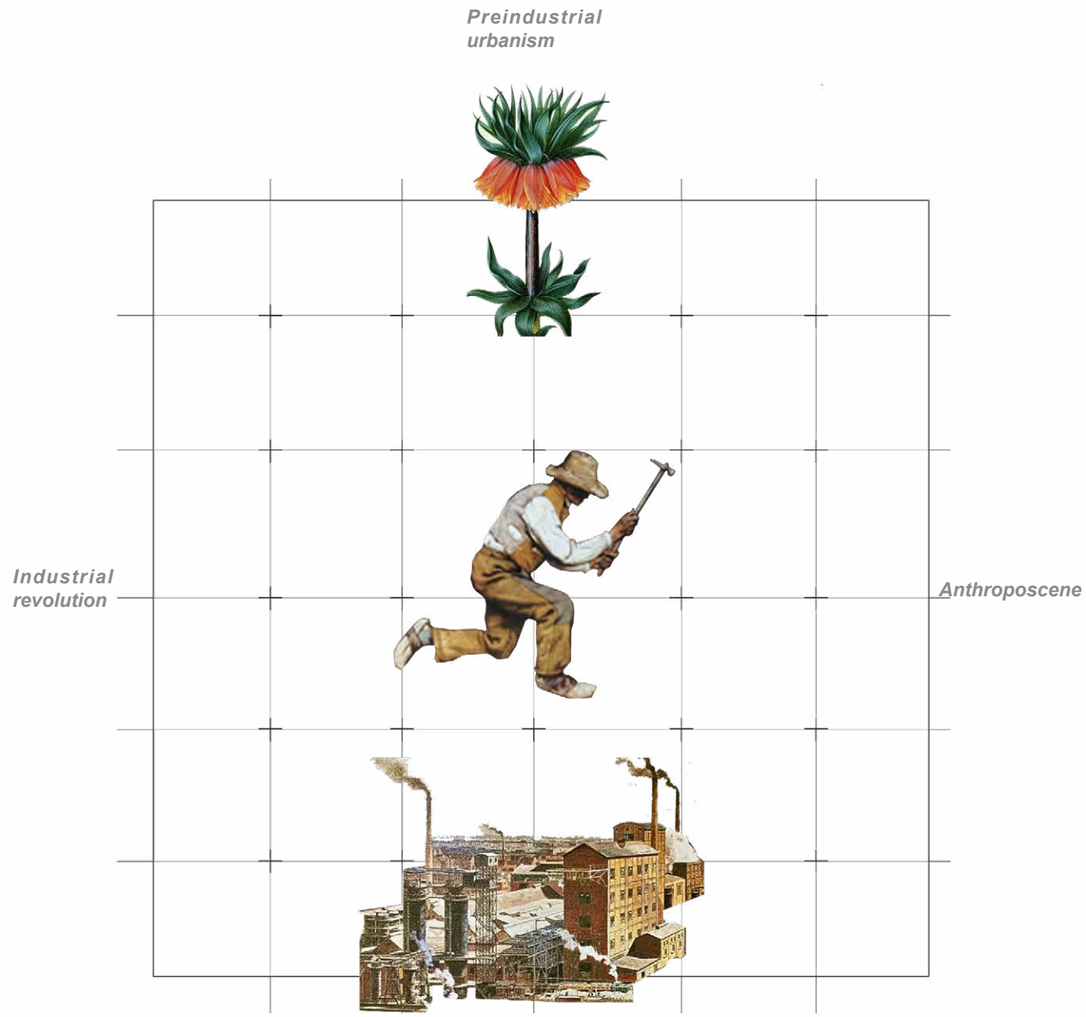
Beyond any doubt, urban green is an imaginary, that later translates into physical elements, which constitute an essential part of the living experience of the city, regardless of the time, period, location or context. As Anguelovski, Connolly, Brand, describe, “we posit that, while greening cities as a catalyst for urban change is not new, green urban planning has shifted from the urban parks movement of the late 19th and early 20th centuries and the community-oriented greening that characterized neighborhood reclamation efforts in the 1970s and 1980s (Jonnes, 2002; Connolly et al. 2014) towards development-oriented greening” (Anguelovski, Connolly, Brand, 2018, p.418). Wishing to surpass the superficial and contemporary connotations of the concept, the research recognizes the importance of talking about its process from a modern but deeper perspective. Hoping to bring the research to the contemporary vision, it is crucial to recognize the post-industrial landscape as the main scenario for the investigation, given that most of the environmental crisis derives from its exponential effects. As many authors have agreed on the post-Industrial landscape as a catalyzer of greening practices, Hillary Angelo discusses: “Though efforts to improve urban public health and make cities more livable through green space stretch back to nineteenth century urban parks and farther, the point of departure for contemporary scholarship has tended to be the greening of post-industrial cities under neoliberalism” (Angelo, 2019, p. 2).

The post-industrial landscape has been the shifting point for greening, wishing to resolve a series of issues related to the environmental factor, maintaining economic growth but barely considering the social aspect when it is under the magnifying glass. As the urban landscape has shifted with the vision of the city, green infrastructure has followed its change in an accumulative process of transformation. Greening is a contemporary vision, as much as it is the heritage of the predeceasing constructions of society, regarding its relationship with nature over time. In contrast to the general definitions in literature, one of the most interesting conceptions comes from the book *“The Greening of Architecture: A Critical History and Survey of Contemporary Sustainable Architecture and Urban Design”,* where James describes:

“The Greening Architecture, including urbanism, becomes a progressive and accumulative process for remediation and repurposing within the context of the tremendous inventory of the existing built environment, and innovation directed to the relationship between evolving cultural needs and new models of green architectural and urban design responses to them” (James, 2014, p. 40). Wishing to propose a concept of greening that successfully considers the analysis carried out, the research proposes a definition that includes the temporal and social dimensions of green infrastructure in the city. Furthermore, and hoping for a vision of the future, the definition seeks to include the ongoing urban relationships as a catalyzer of the production of green and as the root element of the consequences and effects that come with it. Therefore, *Urban Greening* is defined as:

“An accumulative mechanism of translation of the perception and relationship between society and urban nature”.

Without saying that greening is not the creation of parks, green ways, gardens, nature based solutions, among others, its connection with the urban fabric goes beyond a physical translation. Green elements in the city represent the opportunity to restructure the relationship between humans and non- humans from a more equitable and sensible approach. In another words, greening is the outcome of the constant negotiation between nature and society, shifting and moving from what was created before, and accommodating to the present and future notions of urban life.



Diagrm 2: Irreversible Break in the Dichotomy
Illustrated by the authors.

“Thus, as Latour and Wooglar intimate in their book, reality is being negotiated at the same time as its theoretical construction. As both of those, the reality and the interpretation, are not merely social constructions, but at both levels negotiations with nature. Nature’s role in that negotiation takes the form of actively creating something materially new and resisting and accommodating the range of metaphorical and theoretical imaginings with which it is approached” (Bird, 1987, p.259)

Being Nature one of the two main parties in the negotiation process of Greening, the focus of the investigation turns directly to the inquiry of the conception of nature. Recognizing that the type of relationship between nature and society shapes and transforms the urban environment. It becomes pertinent to take a step towards the different connotations of Nature in the development of the city and its societal constructions, in which the subject/object dichotomy has always played a defining role.

1.2. What is Nature ?

Far away from giving a deep and accurate picture of the immense literature on Nature, this chapter seeks to frame the discourse through a few authors that are part of the discussion around the dichotomy. The research adopts a particular position from the debate that concerns the subject and the object connotations.

Ancient Philosophies and Notions of Nature

In the search of understanding the components that constitute the equation of Greening, the line of work, rapidly arrives to the conclusion that the delimitations of *Nature* in the city are entirely given by its relationship to society. This becomes especially relevant when referring to issues that concern the urban fabric, and how it relates with its natural infrastructures. On this basis, the inquiry of literature around Urban Nature brought light to several philosophical studies that dedicate their efforts to understanding the exchanges and links that have shaped the vision of Nature in the city.

The development of this of this chapter, will follow an investigative line that revolves around a series of philosophical explorations and architectural authors of great relevance for this analysis, such as Gandy and Descola. All the sources will dwell on the question of What is Nature? solely based on its relationship with humans, in which the emerging dichotomy of subject/ object rises to the surface as a common point between architectural and philosophical thinking.

In the methodology proposed by this section of the thesis, the temporal dimension plays a crucial role in order to understand, how the relationships in the urban body have shifted and metabolized from an initial conception of *Nature* as a Subject, to the main objectification of *Nature* after the industrial revolution. This metabolism of relationships is directly linked to the historical evolution of the vision of society for the city and to the historical events that have shaped the built environment. Along these lines, it is imperative for the ground work to revise the sources from a chronological point of view, to appreciate the transformation of the definition of *Urban Nature over time.* Finally, hoping to understand the concept behind the ultimate objectification of Nature that cannot seem to abandon the modern day relationships that materialize green infrastructures in the city.

It is fundamental to clarify that this is not a chapter of the history of Urban Nature. For this reason, the thesis will only incorporate a few sources that **better represent the essence of what is being treated as the center point: the shifting relationship between humans and non-humans, from the subject/object dichotomy of Nature.** In this manner the groundwork will start with some philosophical studies that describe this relational metabolism from an ancient perspective, later introducing a series of contemporary thinkers that place it in a modern day context around urban green.

One possible starting point to approach the main hypothesis of this chapter are philosophical currents originated from ancient cultures, due to the fact that these cultures are one of the few evidences of the conception of nature as a subject. Which is actually, the starting point to understand the dichotomy. For this reason, the research finds an immense value in ancient philosophy and its connotations of nature, in which the exploration highlights among its findings, Daoism [8] as a Chinese philosophical current, that successfully exemplifies the value of ancient notions of world and its relationships. The value of this initial source, relays on the fact that, ancient Chinese cultures, as many other ancient civilizations, have based the construction of the tangible dimension in moral, metaphysical, and purposeful relationships with the world that surrounds them, always seeking a balance with natural elements. Within this framework, authors like Jing L. (2016) explore “nature” by questioning it through a comparative methodology between two perspectives, in which the first one, describes the modern understanding of nature as the main root of today’s environmental problems, and the second explains the ancient understanding of “Ziran” as “nature”, in early Daoism. For Jing L. “Ziran” can be translated as “self-going” “being free” “spontaneous”. However, he expresses that self in this context, should not be understood in a metaphysical sense, meaning not necessarily as a human entity but as any individual thing. It becomes important then to define that Daoism stands for a set of Chinese traditions, in which the living in harmony with the “dao” was fundamental, understanding “dao” as “the natural way”, and “ziran” as “nature”.

Embracing this term from the Daoist framework, he relies on an ancient Chinese manuscript that exemplifies the ideals of the Daoist age. According to Jing, they express the intrinsic coexistence between the “dao” and the world. In his research, he proposes that “dao” is formless and imageless, is everything and nothing “It unfolds precisely in the scenery of the ten thousand things between the heavenly and the earthly.” (Jing L. 2016, p. 272). This approach supports the idea that society and nature are in a constant flux and exchange, that subsequently shapes the physical world from a position of balance.

8. “Taoism (also spelled Daoism) is a religion and a philosophy from ancient China. Taoism has been connected to the philosopher Lao Tzu, who around 500 B.C.E. wrote the main book of Taoism, the Tao Te Ching. Taoism holds that humans and animals should live in balance with the Tao, or the universe”. Definition retrieved from: National Geographic Website, encyclopedic entry: https://education.nationalgeographic.org/resource/taoism/

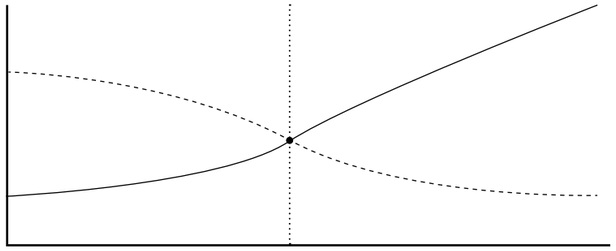
As seen in ancient writings, the conception of nature oscillates in between a tangible and intangible translation. For the purpose of the exploration of the dichotomy, this premise opens up the discussion on the subjetification of nature as a physical tangible object or as a non-defined subject. Furthermore, highlighting the temporal dimension, movement, and fluxes described by Chinese philosophy, will later become a crucial factor for the study of nature and greening as an ongoing mechanism.

In this context, the Daoist definition of nature continues to evolve as a "happening that runs through all dimensions" and it is precisely here, where ancient Chinese philosophy finds a meeting point with Heidegger's reflections around nature. Heidegger, himself was deeply influenced by Chinese thinking currents, which put him in a position against the modern misconception of nature as an object and material. Instead he described "beings" as "*phusis*", what he defined as "what emerges from itself, the self-emerging of beings (Heidegger, 2000, p. 14)". (Jing L. 2016, p. 275)

"Heidegger wants to revive an ancient way of living wherein beings have spontaneity and their being is not required to meet the standards of humans. Phusis as such is not just the totality of beings, rather the very un-concealment of all." (Jing L. 2016, p. 275)

The Irreversible Dichotomy

Subject *Object*



Beggining of the anthropocene *Industrial Revolution* *Today*

In this regard, both Heidegger and Jing, with his take on the ancient notions of Daoism, introduce the connotation of nature as a subject or at least, the separate it from its definition as an object. However, this understanding of nature and its balance with society only circles around early settlements and ancient perspectives, rapidly changing with the evolution of technology and the city, over the course of time. As Ling explains in his reading, in Daoist texts, when referring to "things" there is not a distinction between humans and things, they remain under the same category. However, as we approach today's understandings on the dichotomy, we find that "nature" becomes an object and humans remain as main subjects, moreover in an irreversible manner with the industrial revolution.

From the arrival of the industrial era, humans permanently changed their way of understanding "nature", drifting apart from the notion of self, its objectification became eminent and unstoppable. This braking point reveals the savageness of modern metaphysics, as Jing mentions, in which humans impose themselves as the governors of nature, inflicting a relation of enslavement, viewing nature as a resource. Using his interpretation, Jing, defines modern understanding of "nature" as a misconception. Both him and Heidegger, conceived a balanced exchange between nature and humans essential for the interpretation of the tangible world. A similar approach in the recognition the dichotomy, comes from Matthew Gandy in his own inquiry of What is Urban Nature? in which he starts by referencing Hegel's and Marx´s reflections on this permanent rupture in the dichotomy. In order to better explain Gandy´s ideas, the research proceeds to cite a fragment from his book *Natura Urbana – Ecological Constellations in Urban Space:*

"One possible starting point is Marx's elaboration on the Hegelian distinction between a "first nature," without human impact, and a "second nature" that has been extensively shaped by human needs. For Marx, however, this Hegelian notion of a first nature disconnected from human intentionality also extends to the second form of nature since modernity remains trapped within the ideological embrace of a "naturalized" set of capitalist social relations. In a similar vein, the relationship between "nature" and "history," and the troubled coupling of "natural history," was a source of reflection for Adorno, who sought to differentiate a historicized understanding of nature from a variety of extant phenomenological, existential, and relativist strands of thinking. Furthermore, the very idea of a "pristine" first nature, which has been so powerful within European romanticism, has been extensively dispelled through archaeological evidence for the human modification of ecosystems that extends far back into deep time and clearly predates the origins of agriculture and early cities. Running through this widely deployed demarcation between first and second nature, however, is an oscillation between various points of mediation between nature as a material entity and a more diffuse set of cultural interactions."

(Gandy, 2021, pg. 4-5)

Gandy´s reflections, not only bring light to the functioning of the dichotomy, but he starts to question the role of each one of them in terms of translation in the urban dimension. This deliberation between the "first and second nature", reveals that the conception of Nature as a subject rapidly dissolves in the materialization of society's vision of the city. The subjetification of Nature barely remains in ancient settlements and philosophies, while its objectification has taken the lead in the construction of the city as we know it today. In this sense, this rupture between the metaphysical and moral dimension, becomes an irreversible phenomenon in the post-industrial landscape, leaving society no other choice but to rethink its relationships with nature from a new disruptive perspective.

The ultimate aim of this chapte is to stablish a theoretical framework, in which the type of relationship between society and nature progressively translate into the physical construction of greening. As the research had anticipated from an early stage, many of the philosophical and theoretical reflections around the dichotomy, explain the thinking process behind the materialization of green infrastructures in the city. Nevertheless, the research sustains that, even though the thesis explores different sources and authors, there is not a definitive and unanimous answer to explain the transition and breaking point of the dichotomy. The development of this study, tries to navigate the different approaches to the connotation of nature under four premises:

1) The subjetification of nature cannot be completely dismissed from the history of greening, under the recognition of nature as a self-generating element capable of existing beyond human intervention.

2) The objectification of Nature becomes imminent as the urban fabric expands and technological developments increase.

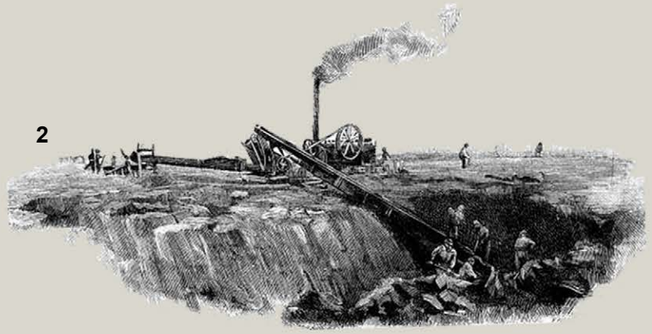
3) The industrial revolution traced an irreversible break line in the dichotomy.

4) Nature can never be conceived as a subject in the context of the contemporary city and the postindustrial landscape, but it can oscillate between the object and the categories in between.

Under these premises the study proceeds to define the so called “in between” of the dichotomy, the gray areas among the subject and the object, wishing to arrive to a more sensible and significant connotation of Urban Greening. In this order of things, the following chapter will focus on the creation of a categorization that derives from the original dichotomy of subject/object, and will propose a series of subcategories that directly referrer to the different types of dialogues between society and nature in the production of Greening.

1

2



3

Diagrm 3: Ongoing Negotiations with Nature
Illustrated by the authors.

1. Daoism, as a negotiation of society and nature/ veneration of nature, animism
2. Object, as a not negotiation between society and nature/ extractivism
3. Subject, as a negotiation of society and nature/ Phusis

1.3. The Categories of Greening

Taking into account the explorations on the concept of *Nature* and Greenging the thesis dedicates the following chapter to deepen in the dichotomy, by creating its own subsystem in the categorization of the subject and the object. With this approach the study wishes to elaborate on the types of relationship that might be found in the in-between of these two opposite poles, and hopefully introduce some reflections on the possible, multiplicity of green.

The Categorization

The complexity of the concept and translation of *Nature* in the tangible world has been countlessly studied from its dichotomy of “subject” and “object”, as a result, generating a variety of approaches that wish to explain it from these two opposites. However, the interconnection among the human and non-human elements suggests that there is a wider spectrum on relationships that ultimately contribute to the creation of green bodies.

Among these perspectives, Bruno Latour separates his thoughts from the “Cartesian” dichotomy between subject and object. “For Latour, birth what we call “nature” and what we call “society are constructed through interactions between irreducible human and non-human actors in vast networks of associations, translations and mediations” (Weber, 2016, p. 521).

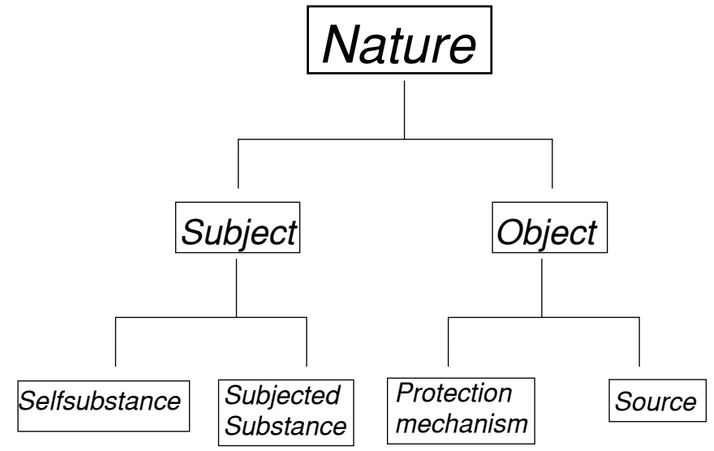
In this respect, the basic comprehension of nature as a “subject” or as an “object”, runs short in order to embrace the complexity of modern day translations of green infrastructures. Nevertheless, the dichotomy, can be taken as the base for deeper perspectives, that take into account the constant and ongoing exchange among the elements in the natural equation. **For this reason, the research proposes an approach that starts with the fundamental understanding of nature’s dichotomy, however, establishing a more complex categorization that consequently describes the production of greening from different connotations:**

1) nature as a subject from two specific perspectives:

    a) as a substance by itself
    b) as a subjected substance

2) nature as an object from two specific perspectives:

    a) a source and nature
    b) as a mechanism of protection.



Diagrm 4: Categories of Greening Based on the Dichotomy of *Nature* *Illustrated by the authors.*

In this manner, the research exposes how the many ways of conceiving *Nature* are correlated with the way humans have interacted with green infrastructures throughout time. In order to bring light to the importance of the study and categorization, it is crucial to understand its undeniable relationship with society and Greening, which in great measure, reflects on modern day urban and environmental issues. As Gandy recognizes this necessity, he proposes the study of new types of relationships, as the key for a productive transformation in the present and future urban areas.

“Does the recognition of ‘new natures,’ exemplified by the cultural valorization of wastelands, offer an alternative to the rise of xenophobic nationalism, and what the writer Anthony Barnett describes as ‘England without London’, rooted in an antimetropolitan, isolationist, and backward-looking political imaginary? Can a different vision of nature, landscape, and society, as both cosmopolitan yet locally distinct, offer a way out of the postindustrial malaise that has blighted so many communities?” (Gandy, 2022, p.3).

In this sense, the research proposes the understanding of nature and greening through a categorization, based on the translation of the multiple interactions that take place in the city, starting from its conception and dichotomy of subject and object, however proposing a new understanding of various subcategories mentioned above. In the creation of possible and emerging “new categories of greening”, this inquiry does not wish to discard or ultimately define a unique perspective in the interaction of nature and the city. On the contrary, it is essential to consider all the possible types of conceptions and interactions among the elements in the natural urban equation. With this clarification, the thesis proceeds to explain and develop the sub-categories around nature, and more importantly, *Greening.*

a. The Subject

Nature as a Substance

Possibly, one of the first categorizations and conceptions of *Nature*, regards its character of subject, which allowed the introduction of other terms such as matter, essence or even substance as some authors like Emma Restall in her book *“The WakefulL World - Animism, Mind and Self in Nature”*, have defined it. However, regarding the direction of the investigation, the term that presents a particular relevance is the connotation of substance, being the one with recurring references in relation to *Nature* and embracing a series of complex factors that constitute it as the ultimate subject. Furthermore, what all of these terms have in common, is the connotation of *Nature* as substantial, a subject that exists by itself, and in some cases an element that presents mindedness and consciousness.

For this reason, it is pressing to highlight the relationship between *Nature* and the Divine, which has been historically and culturally a determining factor of the relationship between man and *Nature*, or, as Descola proposes, between humans and non-humans. In his writings, Descola coins Animism as one of the key elements in terms of urban relationships and prescribes it as “the attribution by humans to nonhumans of an interiority identical to one’s own” (P. Descola, 2013, p. 129). Descola´s approach places Animism in a modern day context, inscribing his ideas from a place of “objective” contemporary urban values. Moreover, the relationship between *Nature* and the Divine through Animism, has been undeniable and essential for many authors in order to define nature as a substance. As Restall discusses the connotation of substance:

“Substance

In Spinoza’s definition, ‘a substance does not depend upon the conception of another thing from which it might be formed’, for it is ‘conceived in itself and conceived through itself’: its nature is self-generated, self-perpetuating, and entirely self-contained. As a result, it cannot interact with any other substance. This is the basis on which the gentle thinker asserted there to be only one substance, which he called God or nature - and of course, being God, it must exist. Such a definition, although rationally acute, is more radical than most” (Restall, 2012, p. 133).

Even though Restall´s perspective takes into account the metaphysical dimension of animism in her writings, she does approach the term carefully, understanding how each one of the metaphysical elements, such a mindedness and consciousness of nature can be tackled in the modern day perspective. This conception of nature, dates back to ancient cultures, agrarian settlements, among other urban origins, progressively contributed to the construction of the city as we know it today.

Image 5: Phosphor Tailings Pond #4, Near Lakeland, Florida, USA 2012
Edward Burtynsky

On the other hand, Restall explores many perspectives, from which it is pertinent to highlight her findings on Alfred North Whitehead and Panpsychism. In a parallel perspective to Leibniz, Whitehead recognizes the physical and mental dimension of nature, in terms of its capacity of transformation as testimony. “Being fundamentally integral to nature, duration therefore ‘implies consciousness; and we place consciousness at the heart of things for the very reason that we credit them with a time that endures’. In other words, the continuity we perceive in nature is made possible by its capacity for memory: nature is thus universally minded” (Restall, 2012, p. 133).

This conception of green as a substance, becomes relevant in modern day landscapes when observing the natural cycles, transformations and movement of natural elements in the urban body. As it has been evidenced in abandoned industrial sites and wastelands, nature will reclaim its own space and regrow without any kind of intervention from humans. In fact, going back to Descola´s work, he has explored the notions of Animism in modern times, from the perspective of remote or indigenous cultures. “Like the Reungao, the Wari’ or the Achuar, a number of peoples in North and South America, in Siberia, and in South-East Asia endow plants, animals, and other elements of their physical environment with a subjectivity of their own; and they maintain with these entities all sorts of person to person relations: relations of friendship, of exchange, of seduction, or of hostility” (Descola, 2011, p. 19).

Given its ancient and remote cultural connotations, it is clear that the subjetification of *Nature* constitutes a connection with it, which stays far away from the modern processes of Greening. However, as the research has stated before, this type of perspectives cannot be completely dismissed from the study of the categories of greening. Especially when trying to look for alternative and disruptive ways of re-greening the postindustrial landscape from a more sensible and balanced approach. With this preamble, the exploration understands that the study of the next category has to surpass the conception of a natural substance by itself, and recognize that the modern takes on Animism can only be studied from a series of exchanges and connections between the human and non-human world. For this reason, the new category wishes to understand how *Nature* as a substance can interact and exist in relationship to others, and step away from the idea of nature as a substance by itself.

Nature as a Subjected Substance

As the categorization of *Nature* drifts away from the primary dichotomy, and the earliest notions, it becomes fundamental to understand two elements that constitute the idea that *Nature* can be in fact, something as complex as a substance. But more importantly, it is an element subjected to external factors outside of its own self. These two elements refer to the temporal dimension and the relationship that is created by the interruption with other subjects. In this sense, a substance in relationship to others, can be approached from the perspective of Hoffman and Rosenkrantz (1996) in their book *Substance: is Nature and Existence:*

“The great philosophers of the past, of course, were profoundly interested in the concept of an individual substance. Aristotle, for instance, believed that individual substances were the basic or primary existents, as did Descartes, Spinoza, Leibniz, Locke and Berkely”. However, one of their most inserting findings of the Aristotelian perspective, recognized the importance of the temporal dimension and the interruption and relationship of the substances with other elements. “According to the first of Aristotle’s characterizations of substance which we shall consider, a substance if that which can persist through change” (Hoffman and Rosenkrantz, 1996, p.1).

In a similar perspective, and without disregarding the intangible and metaphysical character of nature, both Restall and Descola describe the interaction of the physical characteristics of *Nature* and the capacity of humans to perceive them, a key point for their interactions. Together these factors, constitute the concept of *Nature* as a subjected substance. In other words, this perspective states the coexistence of both the mental and physical characteristics in both subjects involved in the exchange. Restall defines this line of thought as neutral Monism, referencing Ernst Mach, who based his idea of exchange with nature:

“Traditionally we might believe that we look at a tomato and consider its color; Mach suggested that it is the redness that we are aware of first. The color is not a physical property of the tomato, for color can’t be said to be a material substance, yet equally nor can it be said to be comprised of the stuff of mind. Instead, both the physical tomato and the mental state are created out of the sensory information.

He realized that ‘the elements given in experience, whose connection we are investigating, are always the same, and are of only one nature, though they appear, according to the nature of the connection, at one moment as physical and at another as psychical elements’; how we perceive those elementary sensations is dependent upon the context.” (Restall, 2012, p. 140).

It is only through a connection that there can be a translation of natural elements within the urban reality. In this case, it is urban nature subjected to external factors that ultimately constitute the idea of greening in the contemporary cities. Nonetheless, it is imperative to clarify that Restall, at this point, still recognizes the character of *Nature* in itself as a subject that can eventually exist on its own, but also as a substance that reacts to its context and it is constructed by it. On a modern take of the metaphysical component of *Nature* as a substance, she reflects on the idea of Animism through its capacity of being perceived. “However, the animist is no idealist: Nature is not mind but minded. Perceived through mental filters, our minds create the world as we see it, but nature itself is not an illusion. As a tradition, Animism highly values the empirical, the experiential, the heuristic and sensuous, for these are indications of integration”. (Restall, 2012, p. 152)

In this sense, this connotation of the subjected substance, suggests a balance between the perception of society and the recognition of nature as an imminent substance. In a modern day perspective, urban nature is the result of an imaginary in which, the importance and character of nature is recognized, however it is merged with the construction of the city, in an ongoing transformation and mediation between two subjects of equal significance. **But what happens when this mediation and relationship in the city becomes uneven? What happens when the human narrative dominates the greening processes in the urban body?** These questions particularly refer to the rupture of the dichotomy, in which the transition of *Nature* as a subject to an object, cannot be stopped and new types of greening categories emerge under the objectification of *Nature*.

b. The Object

Nature as a Source/Resource

Even though the recognition of *Nature* as a subject/substance is incredibly valuable for this exploration, it is imperative to recognize that society has not always placed the natural world in a metaphysical and balanced position. Within the context of the Anthropocene, nature is primarily defined as an object used by society to achieve a certain vision of urban green. Especially, when referring to the findings of authors like Descola and Gandy, for whom the post-industrial landscape plays a distinctive role in the objectification of nature. In fact, the actual condition of urban greening, is the reflection of the social construction of the post-industrial landscape, following the basis in which humans play a dominant role in the equation. As Rogers (1998) explains in his article *Overcoming the objectification of nature in constitutive theories: Toward a transhuman, materialist theory of communication:* “However, in emphasizing the influence of culture and discourse, constitutive theories often position the natural world as something that is passive and malleable in relation to human beings”. (Rogers, 1998, p. 246)

Following up on this idea, the research proposes the urban definition of *Nature* as a resource exploited by society, in order to construct the green and gray bodies that compose the city. Under this light, anthropogenic concepts like extractivism [9] become intrinsic to the discussion when attempting to coin of *Nature* as a source. As the research approaches extractivism, it is crucial to talk about what Rossi (2022) described as “existential risk”, which, justified the use of nature as an object, as source, and as a mechanism. As Rossi explains the correlation between social urban extractivism and a modern post-pandemic reality, he exposes that, “The notion of “existential risk” has gained currency in recent years, describing human-induced processes of environmental change that threaten the survival of biotic and non-biotic entities in the Anthropocene, including the human species” (Rossi, 2022, p. 892).

9. Refers to “The concept has migrated from its origins in diagnosing the natural resource sectors often located in rural peripheries to the densely spatialized inequalities of cities, themselves key hubs of transnational commodity flows (“urban extractivism”). Definition retrieved from: Global South Studies, University of Virginia, Thea Riofrancos

Image 6: Xiaolangdi Dam #1, Yellow River, Henan Province, China - 2011
Edward Burtynsky (Canadian, b. 1955)

The concept of “existential risk”, was initially proposed by the Swedish philosopher Nick Bostrom, explained that this type of threat to society derived precisely from human activity in the anthropogenic period. Later on, this idea allowed the ultimate introduction of extractivism and the objectification of *Nature* as a highly detrimental set of ideas, directly linked to the production and expansion of the city in environmental terms. In this case, urban greening becomes the tool that enables society to coin and utilize *Nature* as a source, from the extraction of raw materials and natural resources, to the construction of urban and architectural projects. Further on in the reading, Rossi explains the emerging processes of thought that contributed to the objectification of *Nature* as a source. “In the same years, along related lines but from a different perspective, biologist Jared Diamond linked the risk of extinction to overpopulation, which leads to resource exploitation, habitat destruction, introduction of non-native species, and various alterations of the ecosystems brought about by different ‘chains of extinction’ (Diamond 2005)” (Rossi, 2022, p. 894).

This line of thinking closely describes some of the practices related to the construction of the urban body, in the view of nature in service of human life, acting as a source that provides the means to shape and build an urban reality adjusted to society’s vision of greening. The reproduction of the project, through the idea of nature as a source, has allowed society to develop cities that adjust to the constructive vision of safety and wellbeing of the human subject. Paradoxically, according to Rossi, many of the environmental challenges in modern day urban areas, come precisely from this way of relating to nature, in which, there is a constant perception of risk and need of adaptation to the external world:

“As climate change is due to human activity (scientists agree that human emissions and activities are the causes of global warming), today’s urban social extractivism is illustrative of the anthropogenic foundations of today’s capitalist economies, at one and the same time as its predatory and exclusionary character” (Rossi, 2022, p. 895).

Nature as a Mechanism of Protection

With the introduction of existential risk, within the context of the objectification of nature, it is fundamental to propose another sub-category that derives from the idea of *Nature* as an object. However, in this case, the thesis proposes a categorization of *Nature* as a mechanism of protection and adaptation to the exterior world. This connotation is parallel to the idea that *Nature* is not something that exists by itself, but an object or a mechanism that is used to translate a set of needs in anthropogenic urban climate. Gregers Andersen in his article *Greening the Sphere: Towards an Ecoethics for the Local and Artificial,* studies the view of *Nature* subjected to human need as mechanism of protection, but furthermore presents some of the deepest reflections from authors, that discuss the objectification of nature as an inevitable reality:

“Thus the Heideggerian way of thinking of caring for nature as “setting it forth” in accordance with the rhythm of the seasons, and otherwise “letting it be” does not mark a way forward in the age of anthropogenic climate change” (Andersen, 2013, p. 139)

As Andersen elaborates in his writing, he describes one of the most interesting lines of thinking regarding the perception of risk of the natural exterior world and the need to transform it though *Nature* as a mechanism of protection. In this particular case, he proposes the trilogy of Peter Sloterdijk, in which the world is viewed as a sphere in which “life” occurs. He proposes three volumes, *bubbles, globes and foam* that describe the immunity and protection inside the sphere, however in terms of this research, it is the last volume (Foam) that best explains the reproduction of urban life using nature as a mechanism:

“This point is as follows: after the death of god, a moment that Sloterdijk links to the proclamation and is therefore in proclamation by Nitzsche, it has been clear that the human subject is “thrown” into a world without any metaphysical protection and is therefore in principle without protection or is on the outside of protection.

In the modern world, the ecstasy of human beings is therefore, according to Sloterdijk, connected to the production of immunity through integral container technology and air- conditioning, since this technological encasement restores a feeling of protection and safety related to the mother and life in the womb”. (Ibid.,140)

Image 8: Exhibition: Joy before the object - Seventeen Gallery, London - Richard Paul *“Inspired by German philosopher Peter Sloterdijk’s book Bubbles” Graphical Reference to: Spheres Volume III: Plural Spherology - By Peter Sloterdijk.*

This interpretation of the relationship between the human and non-human world, is crucial to describe the functioning behind the transition of *Nature* from subject to object. Considering the weakening link of the Divine and metaphysical character of *Nature* in the Anthropocene, urban society separates itself from the natural world and proceeds to control it. In this scenario, human society recurred to the view of what Sloterdijk describes as “Foam” and the need of protection and shelter inside of “the sphere”. In this setting, that nature is again subjected to society’s necessities and desires for a safe and comfortable urban environment. “In a more philosophical reading, this means that the round “shelter” or protecting “region” that Heidegger described in this work from the mid 1930 onwards, especially in gelassenheit 1959, as a result of meditating and dwelling in nature is, to Sloterdijk, something that humans create themselves”. (Ibid.,139)

Andersen deepens into this concept by bringing Heidegger’s perspective to the discussion and concluding that, life from the point of view of protection is as artificial as it is collective. “Co-immunity means civilization and the rules of this civilization are now or never to be understood. These rules code the antrhopotechnique in such a way that individual existence fits into the context of all contexts. The subject, who wants to live under the immunity of civilization, must now make the decision to turn all practices into the good habit of common survival”. (Ibid.,142) It is clear that the practice of Greening and the objectification of *Nature* have been shaped by the social constructions of the city throughout time. In this sense, the dominant narratives have taken advantage of the mechanism of the dichotomy, to make it almost impossible to escape the collective vision around the sustainable city and the objectification of nature. Along these lines, many of the authors and texts that have been studied for this thesis, start to revel a modern day translation of the dichotomy, which ultimately hides behind the production of Greening, under an unbalanced, linear and one-way perspective, solely conceived from a functional point of view.

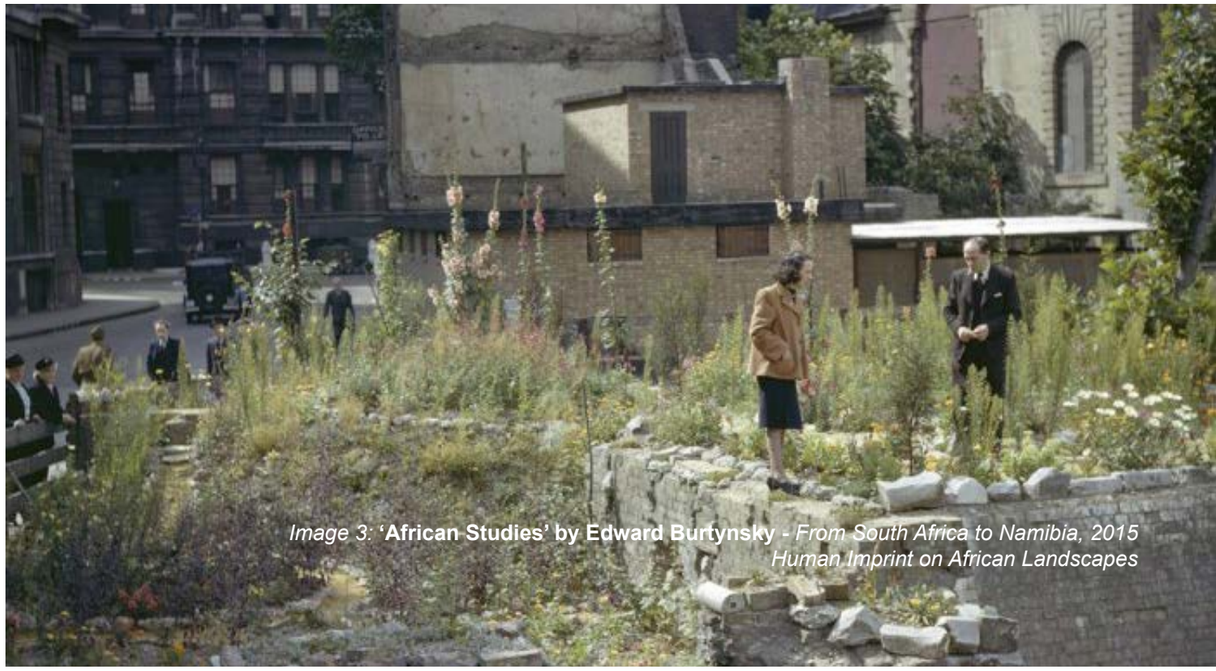


Image 8: Botanists looking for wildflowers on a bombsite, Gresham Street, London (1943).
City of Weeds: Tracing the Origins of the Urban Ecological Imaginary - The MIT Press.

1.4. **Greening in Contemporary Cities:** ***Case Studies:*** *Rotterdam and Torino*

Towards Greening in the Contemporary City

After a theoretical inquiry on Urban Greening and Nature, this thesis applies these concepts and mechanism in the context of the contemporary city. In which the translation of dichotomy has established that unproductive urban spaces, wastelands, brownfields and pieces of spontaneous urban nature, are placed in opposition to planned green. In this context, degradation is perceived as a negative transformation process in post-industrial landscapes, allowing city developers, policies and green governance mechanism to “counteract” against degradation with “sustainable solutions”. However, authors like Barchetta (2021) have brought light to the fact that this degradation processes are a manifestation of the multiple temporalities, historical heritage and socio-ecological mutations that are contained in particular areas of the urban body. Under this perspective, the thesis recognizes and urge to rethink the temporal and conceptual development of the Green City, its faith on the functional and economic values and most importantly, its relationships among, both the social dimension and with non-human species that are part of the urban ecosystem.

Consequently, the next chapters of the thesis, place the spotlight on the application of the research in two case studies, Rotterdam and Torino, allowing the examination of greening mechanisms through an urban lens. Furthermore, these cities exemplify the effects of the crash between the post-industrial landscape, the present environmental and social issues and the degradation of the non-human ecosystems in the contemporary urban fabric. But more importantly, these case studies disclose the future visions and goals for the future with their greening policies, projects and governance, aimed to achieve a sustainable future. It is imperative for the exploration, that the analysis of this two case studies evaluates the coherence between the, envisioning, management and production of green infrastructures, under the established theoretical and philosophical framework. Moreover, the thesis in regards to the deeper meaning of Greening, Nature and the mechanism of the dichotomy that derives from the conception of green elements as subject or objects, in urban terms.

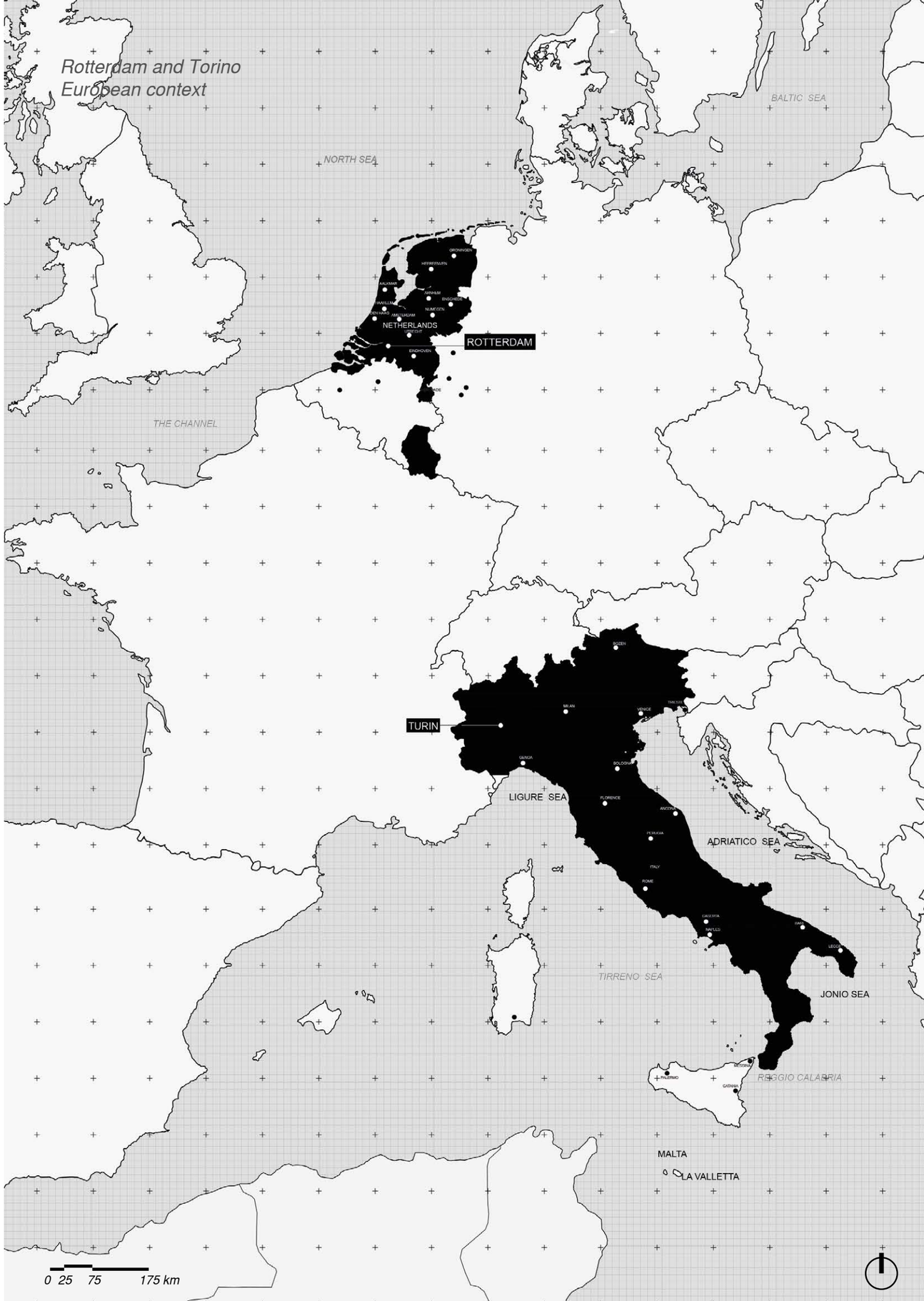
Far away from comparing the case studies the thesis proposes instead to study their particular developments, which will eventually lead the investigation to challenge future scenarios and alternative ways of approaching Greening in the city.

Going directly into the analysis of the case studies, the profile on each one of the cities, will be developed under the same methodological approach. The procedure will be directed towards answering to the main research question for both, Rotterdam and Torino. ***Under the current climate crisis of the anthropogenic era and the reconstruction of the post-industrial landscape, how do current ways of Urban Greening affect contemporary cities, based on the ongoing relationship between nature and society?***

The methodological sequence used to analyze the cases studies will start by giving a general background on each one of the cities, placing their particular position on the framework of contemporary European cities that are aiming to rethink the environmental heritage, behind their postindustrial and post-war realities. Subsequently to the general introduction, and under the recognition of the temporal and historical dimensions as key ingredients to greening, the thesis proposes a revision of the history of greening process for each one of the urban bodies. This historical exploration, will revise the evolution of urban green from the early developments of the cities, to the modern day urban fabric. Hoping to achieve a wider perspective in the expansion of green infrastructures, their mutations, degradation processes and conceptions throughout time, the examination of these timelines, will focus on the vision of green in each one of the historical periods, referencing the initial theoretical approach where the relationship with nature constitutes the physical translation in the city.

After this initial scope, the inspection of the case studies will try to dig deeper into the elements and mechanisms that have enabled the materialization of green structures. With this statement, **the thesis refers to the emerging policies, reports and general governance around green, which ultimately envisions, designs, regulates, and manages these infrastructures in the urban area.** Furthermore, the inquiry on these urban mechanisms, reveals that they have their limitations when defining the ultimate physical translation of the city. In other words, there are other actors and mechanisms that shape the urban landscape and consequently the production of green spaces. With this, the exploration refers to expansion plans, future projects designed by private developers and mobility infrastructure lines, among others. These factors don't necessarily have green elements or environmental focuses as a priority, but inevitable shape the relationships among green and society. **For this reason, the study on the cities will additionally consider three of their most important future projects,** wishing to confront the coherence between the general environmental and green vision of the policies, with the design and development of large scale projects that are part of the bet for economical, functional and sustainable growth for the future landscape.

Getting ahead of some of the conclusions extracted by the analysis of the case studies, this section of the study takes a critical position, and intends to expose the issues that hide behind the traditional "sustainable" development of the city as we know it today. Accordingly, at the end of the examination of the policies and project case studies, the thesis proceeds to evaluate and identify some the risks and phenomena that derive from Urban Greening. Aiming for a more critical view of the side reactions that emerge from the post-green implementation, which seems so promising as a discourse, but cannot hide the collateral effects of an unequitable practice for much longer. A long these lines, some of the terms that came to the surface, refer to social and environmental injustice and unbalance, given that the policies and projects may still remain in a functional and economic motivation. As it follows, the recognition of phenomena such as green gentrification, greenwashing, spontaneous urban nature, synanthropic species, among others becomes an opportunity to challenge existing the urban exchanges. Knowing that these terms are quite large on their own, it is not the intention of this research to go in depth in each one of them, establishing that this thesis stands in a position from which, the main hypothesis is Greening in the city.



Cap 2.0
Rotterdam, a case study

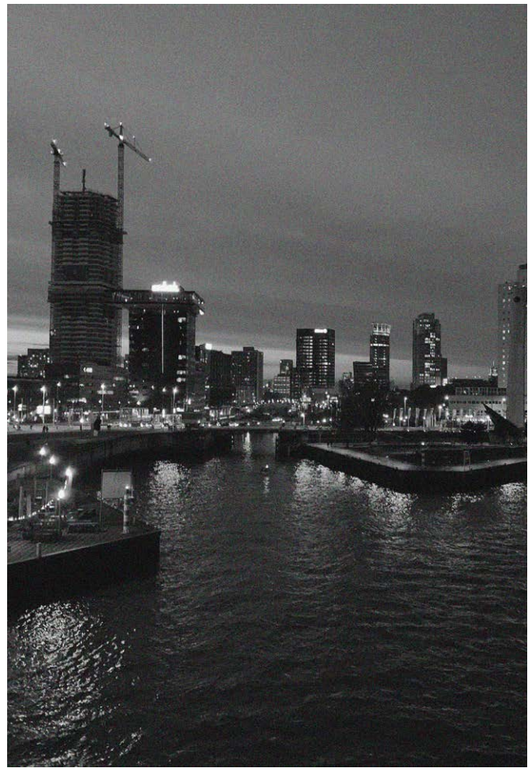
2.1. Contemporary Urban Framework: City of Rotterdam

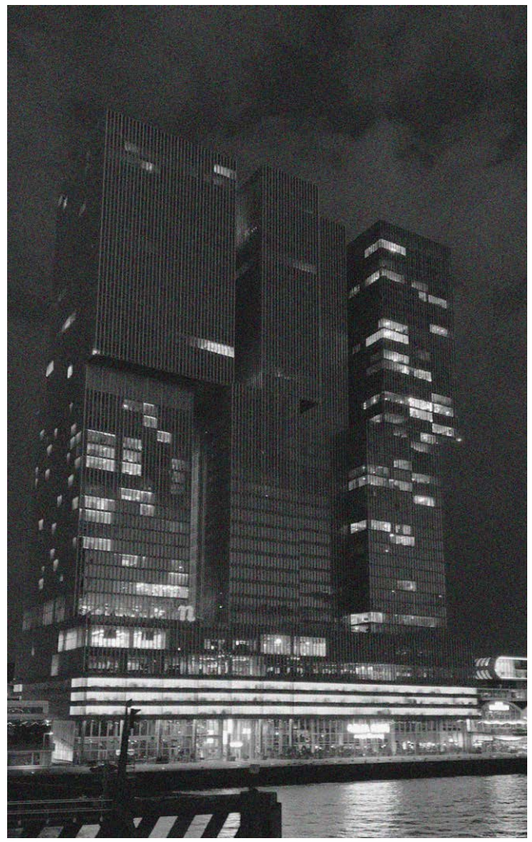
As the methodological approach has established in the previous chapters, the study turns its attention to the analysis of its first case study, in the context of green development in the post-industrial landscape in European cities. The city of Rotterdam is located in The Netherlands, with early settlements that date back to the XIII century, moreover, in the modern day picture it is one of its four main metropolitan poles [10]. This morphology and growth of the city are strongly correlated with its natural environment, due to its particular geographic position. It is located on the Rhine-Meuse-Scheldt Delta, which extends to the North Sea, and it has conceived an intrinsic urban development to the water structures that cross it and surround it. This relationship with blue bodies, has always granted the city with a strategical position as a commercial port and industrial passage, in terms of transportation for North Western Europe.

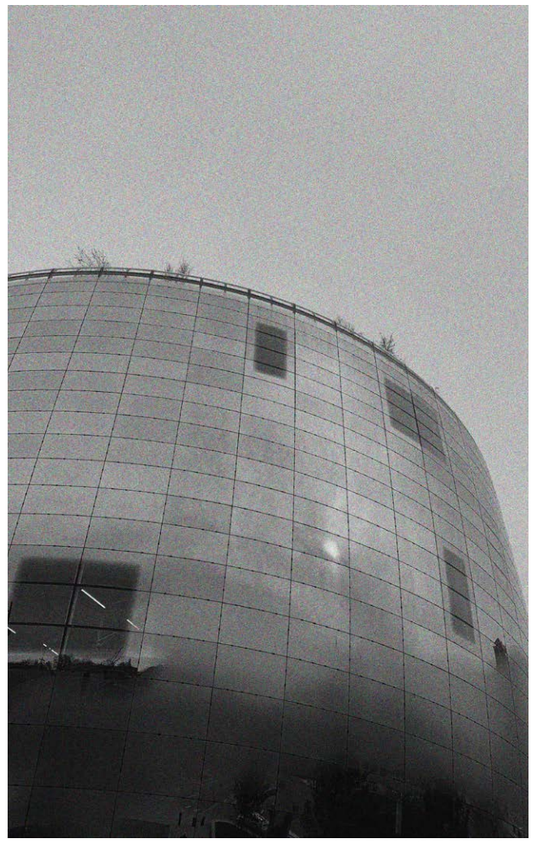
On the other hand, the city has faced several issues and challenges, precisely due to the fact that its development is limited by water bodies. Being under the sea level, the constant battle for land expansion and prevention of floodings, has become part of its urban heritage now more than ever. Rotterdam is located in the Maas estuary with the Nordic Sea being subject of numerous floodings, throughout its history, due to its vulnerable position . Moreover, is important to mention that the urban area first started as a fishing village, that later in the 1200s, evolved into the city of Rotterdam, and the largest port in Europe, as it is known today.

Up to the industrial revolution in the 19th century, its development revolved around the construction of its character as an urban port, leaving its relationship with nature solely based on the management of blue infrastructures. Even from an early stage, the urban area has exposed a clear objectification of nature in function of its economic growth, shaping the course and flows of water bodies to fit the commercial requirements at all costs. However, Rotterdam is pushing its urban planning regarding new visions and developments of the contemporary city. This is primarily due to the fact that during World War II, almost all of the urban body suffered a massive wave of destruction, wrecking its ports, historical center and residential areas, leaving the city with a blank slate.

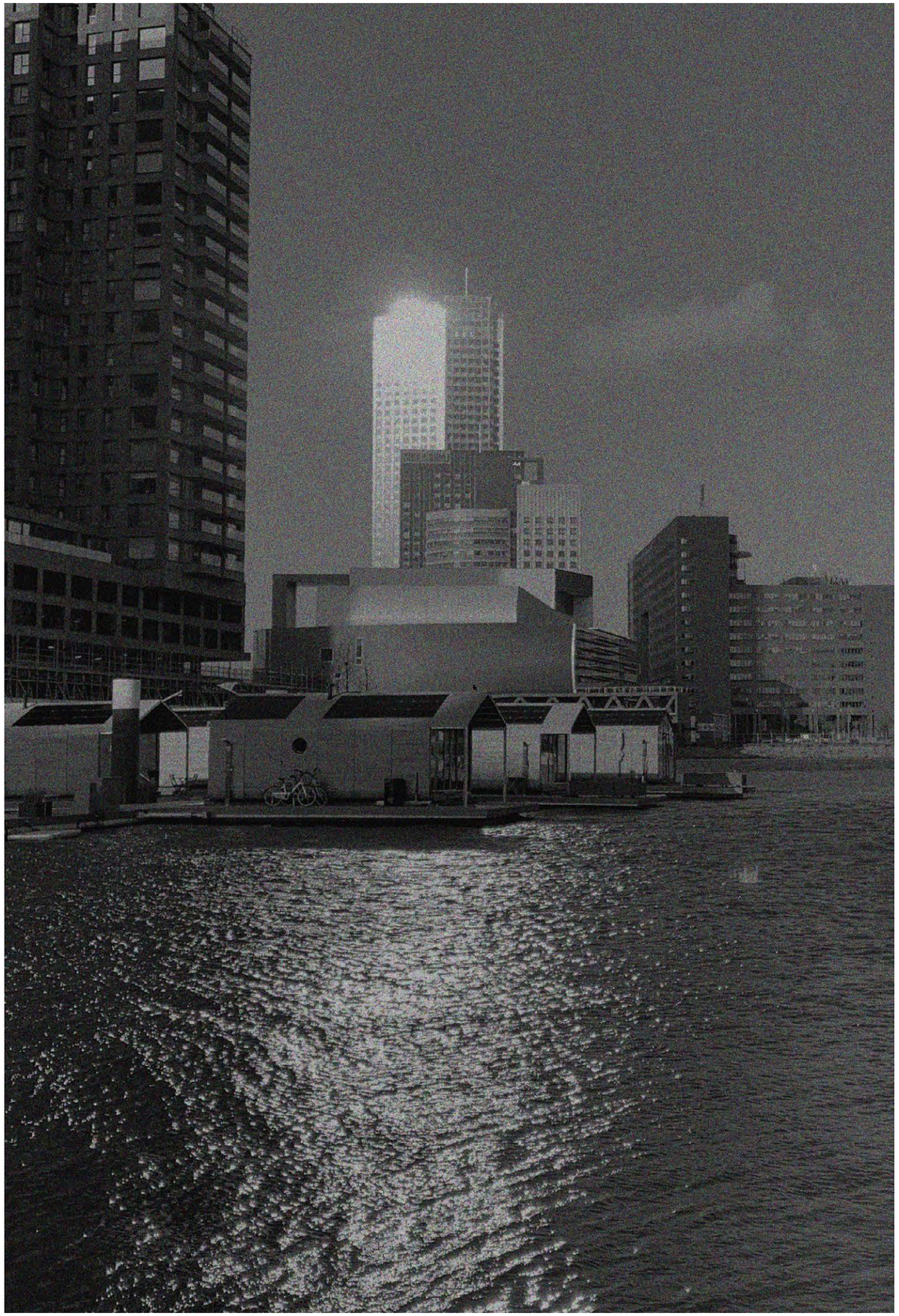
10. The Randstad in The Netherlands, encompassing the Randstad cities of Amsterdam, The Hague, Rotterdam and Utrecht, but now extending outwards to include the new city of Almere in the reclaimed polders east of Amsterdam. Hall P. (2006)







Pictures taken by the authors



In the process of reconstruction of Rotterdam between the 1950 and the 1960s, there was a primary urge to rebuild the inner city and the infrastructure that constituted the port. This urban repair filled the city with concrete, including paved canals, making few to none efforts towards the production of green. It was only with the emerging environmental crisis in the past decades, that the city took a turn to climate mitigation strategies and greening. As the city joined international trends to counteract against climate change and the promise of the sustainable future, the city proposed a new organization towards the management of green infrastructures, currently regulated by three offices, the *Urban Development Office, the Sustainability Planning Office and the Climate Adaptation Office.* In addition to these main actors in the sustainable development of the city, there are other two organizations that provide their support for policies implementation with different scales and stakeholders, the *Rotterdam Climate Initiative* [11] *and the Delta Program* [12].

Water: The Ultimate Green Object

The Delta Commission Report of 2008, called upon the creation and reinforcements of policies focused on climate mitigation with "sustainable" strategies and mechanism to manage the blue bodies in the city, furthermore, allowed new ways of reflecting around with water bodies and their management for the future city. As it is disclosed by the article "*Designing a Metropolis. Rotterdam looks ahead":*

"In this regard, in 2005, the second IABR (International Architecture Biennial Rotterdam) focused on the theme of water and the relative risk of flooding by placing the role of city planning and the design of adaptive spaces at the center of the scientific and institutional debate. The issue was brought to those drawing up the "Rotterdam Waterstad 2035" Plan in which the subject of water is completely overturned. 'Water as a threat' is changed into 'water as a resource' projects promoted different spatial solutions – such as floodable squares and green roofs – discussed and illustrated on a metropolitan scale and using technological means" (Castigliano, 2011, p. 49).

The "Rotterdam Waterstad 2035" Plan, one of the most interesting approaches concerning this research, when trying to understand, what ***Nature means for the city of Rotterdam.*** On one hand, the initial idea of ***"water as a threat"***, brings back the notions of ***"existential risk"*** and the semantics behind the idea of nature as a mechanism of protection. In this case the relationship with nature and with water bodies is based on the necessity to be protected from it.

11. "A coalition of the Port of Rotterdam, the City of Rotterdam, employers' organization Deltalings, and DCMR Environmental Protection Agency Rijnmond is aiming to achieve a 50% CO2 reduction target in Rotterdam by 2025 as compared to 1990". Retrieved from: Rotterdam Climate Initiative 2012

12. "The Delta Programme is in place to protect the Netherlands from high water and flooding, to ensure a sufficient supply of fresh water, and to contribute to rendering the Netherlands climate-proof and water-resilient". Retrieved from: The Delta Program Official Website

On the other hand, the transition towards the meaning of ***"water as a resource"***, still maintains a direct link to the perception of nature as a possible risk, however, gravitating towards a relationship with ***nature as a source***, described by thesis on previews chapters. Along these lines, the greening processes in the city have consequently been produced around the perception of water bodies as a priority. Elaborating on this idea, the production of green elements, the city presents a main Greening Strategy, "The Gemeente Rotterdam", featuring two co-centric green rings, which will ideally be crossed and connected by blue corridors. Following this initiative, the "Handbook of Rotterdam's Style" of 2008, placed green infrastructure as an intrinsic element. The importance of green pockets, urban trees and plants was highlighted as one of the main strategies to provide ecosystem services and overall "sustainable relationships". Along these lines, the most recent, "Sustainability Vision" presented at the 5th International Architecture Biennale Rotterdam (Frantzeskaki and Tilie , 2014). The vision, focused on two processes on a general level to achieve sustainability, densification and greening of the inner city.

"However, except from turning parking lots and areas near the waterfront into green spaces. There is no reference for creating new green space at the surface that can be used as public green space. To conclude, even though the Sustainability Vision offers a view on how to better integrate solutions to meet the needs for more housing and more green space in the inner city, it points out that there is a trade-off in achieving these needs". (Frantzeskaki and Tilie , 2014, p. 548).

With this panorama, and according to Frantzeskaki and Tilie (2014) in their article *"The Dynamics of Urban Ecosystem Governance in Rotterdam, The Netherlands",* "Rotterdam is at the same time one of the greenest large cities of the Netherlands. A total of 747 000 trees grow in the parks, port, and alongside the rivers. It has a total of 117 public parks (1765 ha), some of which are well known like Zuiderpark and Kralingse Bos. Green space in Rotterdam covers 19.7 % of the total city's surface whereas water amounts to a 34.9 % including the harbor (Gemeente Rotterdam 2010)". (Ibid., 544).

In this order of things, this thesis proposes the understanding of greening process in the city of Rotterdam as an intrinsic element to the management of water bodies, becoming part of the policies and regulations for the production of the "sustainable city" in the Dutch panorama. However, the introduction of green elements has been progressively included in the city's development plans, and it is only through the inquiry of its greening history, that the research will be able to challenge the greening processes in this particular urban fabric, and the transitions that derive from the subject to object dichotomy, in such a context. With this introduction, the study continues with the revision of the city's greening history, to better understand the exchanges and relationships that constituted the green infrastructure as is known today.

Image 9: RWG gaat terminal in Rotterdam.
Redactie A. (2023)

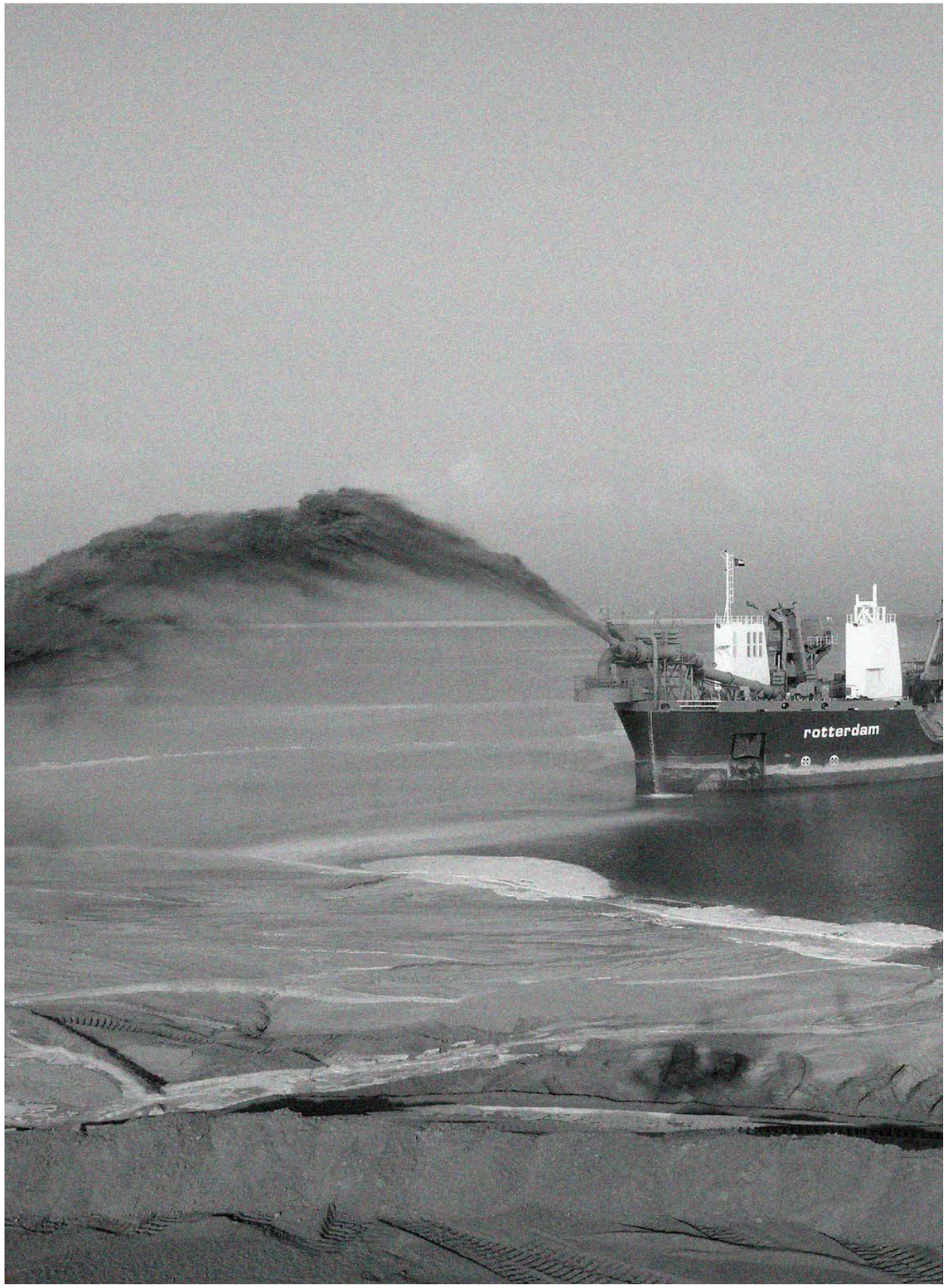


Image 10: Land Reclamation Process.
Unknown Author (2023) Maasvlakte 2 in the Port of Rotterdam.

2.2. History of Greening

Netherlands

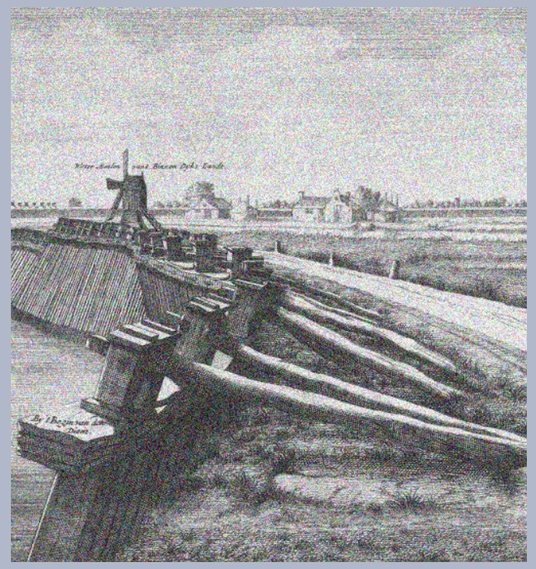
South Holland

Rotterdam

To fully comprehend the greening panorama, it is necessary to set a historical framework of greening throughout the temporal dimension. Rotterdam has historically been positioned in a strategic node as a delta city, located in the Maas River in connection with the North Sea, meaning that has a maritime connection with the rest of the world, however, its position has been a hazard in terms of natural disasters, specifically floodings. Measures have been taken throughout history to mitigate nature action in the city.

1000

1270

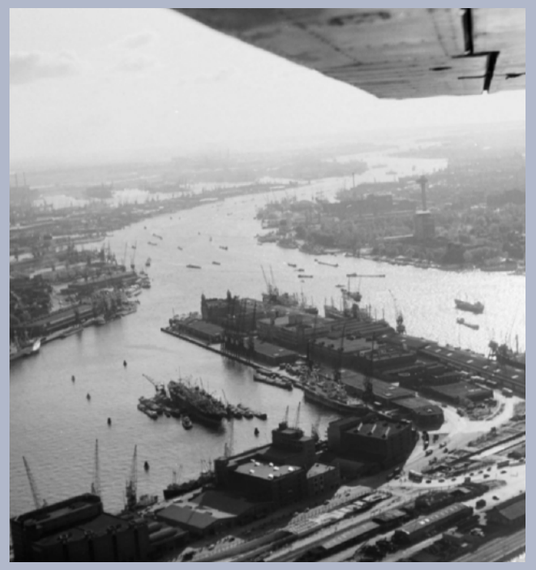


High dike construction

The city settles for the first time around the year 1270 in a dam created to connect the river Rotte and the Nieuwe Maas. It was originally an agricultural settlement and a link between England, Scandinavia, and Germany, an agricultural trade route.

Even though its position seemed apparently privileged, the settlement was hit by massive floods at the end of the XII century, following the construction of the first dike (high dike) from Schiedam to Gouda to protect the city from future disasters.

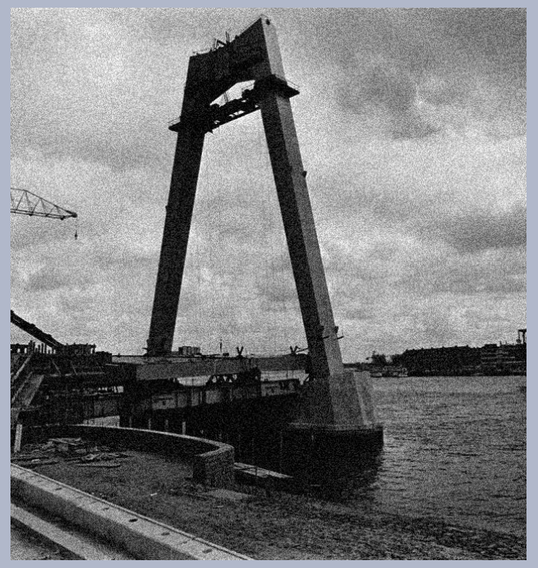
1825



Port city

The imminent industrial growth during the industrial revolution influenced the expansion of the port increasing the demand of labor. This allowed the flows of the moving of families from other cities in Holland to Rotterdam, as well as immigrants from other part of Europe. To host workers, the city devoted polders in the city center.

1878



Willemsbutg construction

The first bridge was constructed as a permanent connection between the north and south above the Maas River, it's the start of a new process of urbanization. New residential areas are built, Chinese immigrants live in Katendrecth and workers from Brabant and Limburg in new areas in the south as the farmer's area. Subsequently, Rotterdam started adding small towns to the city in the south, and west (Charlois, Hoek van Holland)

1940

German bombing

During the second world war, the German bombing in the city caused the destruction of the city center leaving 80.000 in the streets. "On the 18th of May 1940, a few days after the bombardment, the city's sitting mayor and aldermen commissioned city planner Willem Witteveen to draw a reconstruction plan." Palman F. (2015)

As a result, the reconstruction of the city started the new beginning of one of the only Dutch cities with a new city center, having the first skyscraper in Europe, the reconstruction opens the doors for a bigger development with high-rise buildings.

2.2. History of Greening

Netherlands

South Holland

Rotterdam

1940

Reconstruction first plan

Some designated architects supported the idea of reconstructing the city from scratch, even before the war several plans were made to modernize the city. These planners thought it was an opportunity to finally make urban modifications without any preexisting context and build a new city. Initially the architect in charge (Willem Witeveen) designed a modest proposal that after was replaced for a more radical one due to political interests done by Cornelis van Traa, the plan was called “Basisplan” and replaced structured design by rejecting conventional planning models.

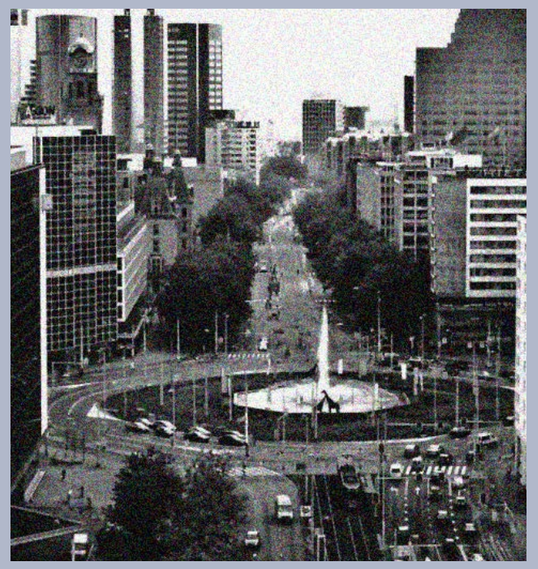
1960

An irruptive replacement

“By the late 1960s, regardless of the reconstruction euphoria, the new development made way for scepticism and criticism. People felt the new center was barren, impersonal and cheerless. It needed to become more attractive, vibrant and greener, and especially, it needed more homes and recreational amenities.”

“In the 1970s, Amsterdam architects like Piet Blom were brought in to add some charm to the city. Buildings from the reconstruction era were demolished and replaced by contemporary architecture”.

1970



FInish of reconstruction

Van Traa´s plan shifted from the rigid initial one to a flexible scheme masterplan, essentially defining infrastructure and zoning, separating residence areas from work and leisure. The planning was designed in two dimensions (intead of three) opposite to Witteveen’s. These new plan did not prevent possible transformations in the future and allowed a more flexible approach. The historic city centre was preserved and overlayed with a regular grid of transport arteries.

1940

New begining

The “basic plan” gave the city a deeper range of options to explore, allowing the urban body grow in one the most revolutionary ways of modernizing by creating a powerful contrasts between urban elements and new high-rise buildings not possible before the bombing.

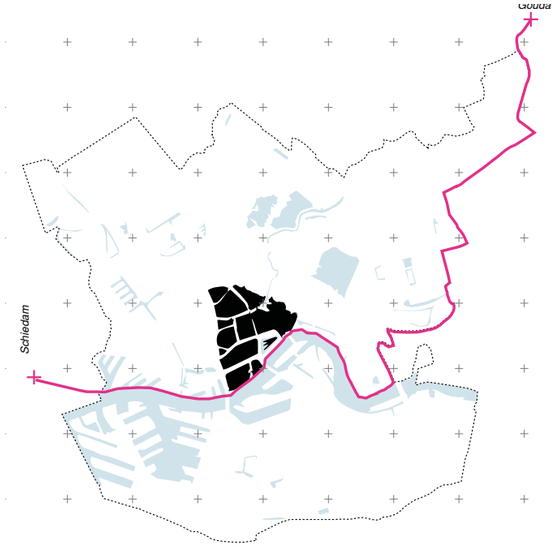
Netherlands

South Holland

Rotterdam

1000

1270

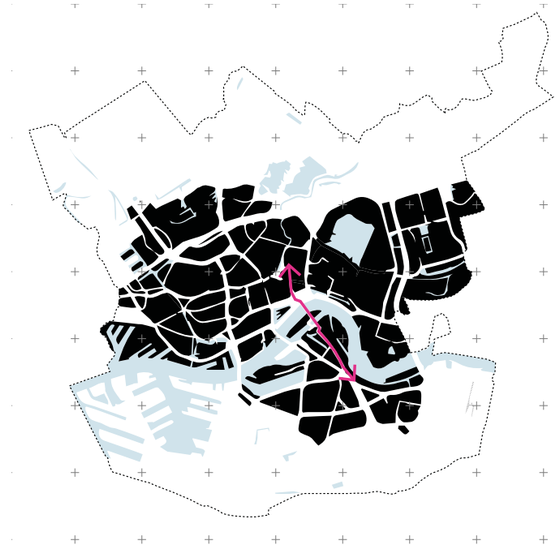


High dike construction

1825

The Port city

1878



Willemsbutg Construction

1940

German Bombing

Urban expansion in the city of Rotterdam in relation to the morphological growth around blue bodies.


Rotterdam
current urban situation
0
2.5
7.5 km

2.3. The Greening Mechanism: Rotterdam

Having settled a framework of the historical development of water management and greening, around the reconstruction Rotterdam in the post-war context, this research looks forward to revising the contemporary management of these infrastructures. Under this light, the thesis carries out the examination of municipality reports and policies to provide the administrative framework to translate the present and future vision of urban natural structures. Yet, the main motivation behind this methodology is discover the reality under the question of **How does Rotterdam defines and relate nature, and consequently Urban Greening?**

In order to provide this answer this research aims to gather a set of important definitions the municipality considers in its reports, as well as highlighting important greening strategies and plans to aim to define the meaning of nature in Rotterdam. As mentioned in the historical timeline, Rotterdam is in the Rhine-Scheldt Meuse Delta, encompasses an amount of 611.000 people of a complex and diverse set of 173 nationalities attracted for the work opportunities since the industrial period. In modern day times, it is the biggest port in Europe and the one with the lowest delta. Due to its position, the city has dealt with different uncertainties hazards, and environmental pressures (rising sea level, floodings). As it follows, it's one of the greenest cities in the Nederlands with a total of 177 public parks that account for 1765 ha covering 9.7% of the city surface. On the other hand, water covers up to 34.9% including the harbor (Gemeente Rotterdam 2010).

In order to manage natural elements in the city, since 2005 the municipality created a structural report that provides a green strategy and vision. In a synthetic manner, this first document explains **how greening acts in the city: a concentric structure of green rings where the blue infrastructures (rivers Rotte and Schie) could go across.** This first report (2005) prioritizes the connections between the existent and future green spaces at a city scale. The implementation of this first strategy allowed the city to acquire 500 ha of effective public space by developing connections in the already existent green structure.

From the 2005 report until the 2021 there was not a clear vision at a city scale, since the focus shifted to a renovation and maintenance of the city center. Nevertheless, this report has been updated every two years, leading to an important version in 2009, in which the report "The Vision for Urban structure" appears. A municipal evaluation developed based on the "Handbook of Rotterdam´s Style" (2008). This document describes a series of guidelines for the city development, around the natural infrastructure. Frantzeskaki and Tilie (2014), comment on this report, discussing "Sets the benchmark for what can be introduced in Rotterdam city in terms of urban design and also positions green infrastructure as an integral element of city's structure.

Leaving aside blue infrastructures, greening in Rotterdam, is conceived as an element that provides quality in the city environment in which people can gather and entertain. Both quality aesthetical and mitigation benefits are introduced as perks that come with managing nature inside the building environment. "In the Sustainability program, the greening of the city is referred to contribute to climate regulation, regulating heat stress, improving health, and buffering industrial noise. This is the first program that addresses the many benefits of green spaces for citizens and explicitly shows its multivariate contribution to urban sustainability (Gemeente Rotterdam 2012a)" (Frantzeskaki and Tilie, 2014, P. 546).

As previously mentioned by the research, the Sustainability Vision from 2012 provides a strategy of greening densification to ensure energy safety in the city through two strategic objectives: densification and greening of the inner city. However, under this scenario, the new greening opportunities also become a challenge, since the space is being reduced and the areas for experimenting and developing greeneries are only possible in the periphery. Another technological solution to the problem, refers to the use of the limited space in the center, meaning creating green walls and facades in the existing buildings but not effective public space or greening in the surface level. As it was disclosed previously by Frantzeskaki N, Tilie N (2014), aside from the transformation of parking lots and portions of the city near the waterfront into green areas, the city faces a crisis when it come to the creation of new green surfaces as public space.

This issue, plus the focus on renewing the inner city, is translated on the way the municipality aims to increase the square hectares in the last years in Rotterdam. As shown in the greening action plan of 2019, that the objective was to increase 20 ha of greeneries by alternative strategies of non-soil surface use. Within the same plan, **greening was understood as an element that not only provides a better quality of the living environment by conceiving spaces for recreation, but also contributes to climate adaptation and increases real estate prices.**

Under this light the ways of increasing the greening surface in this action plan are related to spaces in the inner city (already densified). Using areas aside from the ones at the ground level, becomes necessary in order to reach their goal of increasing 20 ha of greeneries, considering the difficulty behind adding green effective surfaces in the current state of density. (Gemeente, 2019) (Frantzeskaki and Tilie, 2014)

The strategies proposed, are focused on increasing the green surface by means of public and private roofs, adding green surfaces next to the port and industrial areas, renewing existing public spaces with the scarcity of green, and auditioning green areas next to dwelling zones (front yards, facade gardens, orchards). With this context, the plan makes evident the scarcity of space for developing new efficient public space in a dense city like Rotterdam, not without mentioning the economic and political benefits that the plan aims to reach. As mentioned before, since the 2005 the general green plan of the Rotterdam, did not concentrate on the metropolitan scale, precisely because the aim shifted to a renovation of the city center scale. However, the 2021 vision green plan worked towards enlarging the area of scope, expanding it to the complete municipality and dividing it into 4 areas: Urban area, port area, residential centers, and landscape areas.

As it follows, the vision extended its field of action and consequently the 2021 vision created five long-term objectives, **for which nature is meant to be understood in the future as an urban ecosystem that is part of a good physical living environment in which sustainability is highlighted.** “Rotterdam is growing into a city and port that offers leadership shows in the transition to sustainable energy, circular processes, and a climate-neutral society... Rotterdam offers plenty of room for experiments and owns initiatives for residents and entrepreneurs. Rotterdam is like that, ready for the future and contributes to limiting climate change and economic renewal” (Gemeente, 2021). As a response to the initial research question, is concluded that the different versions of the municipal reports dedicated to greening in Rotterdam have a multiplicity of meanings, scopes, and scales of Action.

Definitions of Nature throughout the different plans, City of Rotterdam.

2005

Concentric structure of green wings where blue infrastructures can go across.

2009

An element that provides quality in the city environment, in which people can recreate, appreciate, and enjoy of an aesthetic appeal, an element that can be used for climate change regulation in different scales from architecture to city planning.

2012

Strategy of greening densification to ensure energy safety in the city through two strategic objectives: densification of the inner city and greening of the inner city.

2019

Greening as an element that not only provides a better quality of living environment by conceiving spaces for recreation, but it also contributes to climate adaptation and increases real estate prices.

2014

Follows the 2005 action plan focussed on creating ecosystem connections in biodiversity

2021

An urban ecosystem that is part of a good physical living environment in which sustainability is highlighted.

However, based on the theoretical approach conceived in the first chapters, regarding the nature categorization, is evident how the reports understand nature first as an object, focused on giving it a meaning only in its capacity to counteract of climate change in the city, recreation, provide ecosystem services and even increase real estate speculation prices.

For Rotterdam, Nature and by consequence Greening, is understood as an object that provides benefits to the city. **It is an object of contemporaneity, that oscillates between the notions of a mechanism of protection and a resource.** Providing technological solutions and mitigations tools to provide a safe environment under the current climate crisis. Reducing its greening strategies to technological constructions, such as green roofs, terraces floating gardens) experiments in the reduced space the city has, and a show of contemporary uses of greening.

Green infrastructure
Zuid Holland region

North sea

The hague

Delft

Schiedam

Rotterdam

Nieuwe Maas

Dunes *Dune forest* *Tidal nature* *Parks* *Water bodies* *Polders*

0 *2.5* *7.5 km*

2.4. *A Broaden Look to Governance and Urban policies*

Rotterdam Goes Green 2018-2022

In 2018 the municipality of Rotterdam released a greening action plan, in which the addition of 20 hectares to the green network of the city, were planned for a timeframe of three years. This was a municipal objective, hoping to add green spaces on all levels, from public spaces to residential areas. Moreover, for the realization of the 20 hectares, the participation of private and public actors, was recognized as a crucial element. These hectares were divided into different pillars (referring to types of intervention), consequently an area estimation of possible square meters per greening type, was made to calculate the amount of feasible area to be developed. However, these estimations varied during the process.

The four different main fronts tackled by the greening strategy, corresponded to green roofs (public and private) working spaces (business parks, commercial offices, port zones) public spaces (maintenance and furnishing plans), and greening areas near residential areas (residents, and school courtyards). These action fronts evidenced the interest the city on developing and renewing inner areas, by means of using alternative strategies of non-soil surface use and tackling the lack of expansion area. Even though the inner city presents a deficiency on areas to developed effective public space, the greening plan aims to increase them recurring to by alternative strategies.

Going directly into the policy, “Rotterdam goes green 2018-2022” proposed to build 18.000.000 m2 of green roofs. With the implementation of private and public partnerships, the municipality pushed the creation of incentives like a system of subsidies to impulse the process with the citizens help. The city has targeted the addition of around 60.000-80.000 m2 each year to the green network and had obtained a total of 360.000 m2 of green roofs by the end of 2018. (Gemeente, 2018).

Some other incentives were proposed in 2019 to carry out this goal, like the reimbursement of 15 euros per each square meter built, furthermore cooperating with the housing agreements and plans to develop additional green roofs areas in the new projects. The joint work of the municipality and the new developments were conceived as the main strategy to increase the areas of interest for greening.

Regarding the redevelopment areas, the action plan intends to rediscover possible greening areas around certain vacant spaces near business parks, offices, and port areas that can be subject of greening. This measure pretends to use green spaces as a mechanism to reduce the Urban Heat Islands caused for the big surfaces of asphalt and moreover, reduce the rainwater runoff besides creating a more attractive work landscape. Adding vegetation in these spaces is a collaborative work between the municipality and the private companies, these spaces become a challenge given their need to be adapted to every intervention area depending on its context. Therefore, the action plan struggles to bring a sensible and specific solution for adaptations to the different set of project surfaces adding to the total quantification of square meters. In order to tackle this line of action the municipality pretends to develop revitalization projects in the industrial polygons of the urban body and at the same time work on the revitalization of roofs and facades. The action plan contemplates as well other ways of revitalizing industrial polygons by building semipermeable pavements to infiltrate water into the soil.

Besides that, as a result of municipal and private partnerships, the creation of a climate subsidy scheme was incorporated to the general strategy, in order to build new climate-resilient buildings and receive contributions from the municipality. This strategy seems promising, considering that it also involves the addition of more green roofs as effective surfaces. In this sense, the municipality and private and public entities alliances allow to use their infrastructure, with additional green infrastructure in roofs, and the general improvement of offices and port areas. Subsequently, when talking about the port area and its improvement the action plan, the general plan discusses the options for the upgrade of waterfronts, as well as improvement of quality and vegetation together with the port authorities. This objective was conceived to be developed through subsidies and cooperation actions among the interested stakeholders.

Another one of the main point of action of the 2018 action plan, considers the already existing green spaces in the city and considers their maintenance, redesign, or renovation aiming to increase the green surface on them. To achieve this goal, the municipality carried out the creation of an inventory of proposals that can be developed to increase greening surface at ground level. **This action plan unlike the previous ones, considers the green and blue infrastructures as a unified urban ecosystem and proposes to increase their connections in the inner city and the periphery, understanding the benefits it brings like more biodiversity.**

The fourth key ingredient of the action plan, refers to the development of green surfaces near households, meaning increasing the green areas by means of either private or public interventions. This project corresponds to the addition of gardens in facades, by self-management which can be maintained by the executive neighborhood board, as an example of maintenance and administration. In this order of things, the general structure of the plan remains, with four pillar or challenges, as it follows:

1. ***Green roofs***

2. Industrial parks

3. Redesing or maintenance of existing greening

4. Small private-public partnership interventions

In a general vision, the policy believes in small actions can contribute to increasing the green surface in Rotterdam, with the collaboration communal and private partnerships management. However, in order to make this exchanges possible, the main motivation behind the plan remains in a functional and economic spectrum. The production of benefits for the private actors and developers is made very clear throughout the processes, constituting greening as a mechanism of retribution for the future. Along this vision, the objectification of green becomes evident, even when trying to work at a smaller scale, the discourse behind the greening plan still remains within the notion of “implicit” benefits of the “sustainable city”. Without saying that this project does not have the potential to deliver the promised outcome, it might be possible that the general conception of overlooking some of the collateral effect and issues that can emerge from following a single dominant narrative of urban green production.

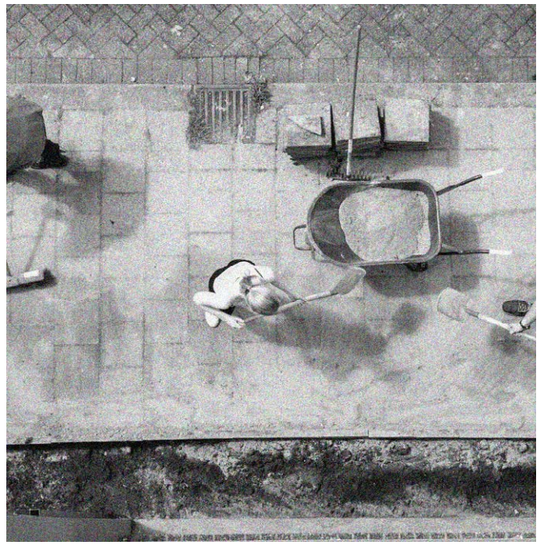


Image 11: Rotterdam´s Goes green Strategies - Rotterdam goes green 2018-2022
Photo: Groene Kaap/courtesy Rotterdam Partners

Environmental Vision 2021

Following the line of investigation, when discussing Rotterdam's future vision, it's important revise some of the proposals and documents that tackle modern day problematics and future projections for the city. Accordingly, "Rotterdam´s 2021 Environmental Vision" appears as a response to the Coronavirus crisis in 2020 and 2021 and presents an important emphasis in climate adaptation.The vison is intended to be an integrated set of objectives that considers the improvement of what the municipality defines as "the physical environment of life", which means all that´s necessary to live, and work; study and recreate. It includes all the elements that determine the public space in the city, such as buildings, infrastructure, water systems, water bodies, air, landscape, nature, cultural heritage, and world heritage. (Gemeente, 2021)

Another key element of this vision, is its metropolitan range of action, which is tackled the first time since 2005 by the municipality. Conceding the large area of implementation, the city extension is divided into 4 smaller areas:

Central urban area: where a big percentage of the surface is devoted to the built environment.

The port area: a logistic and industrial complex of 81 km2.

The independent residential cores: are essentially 5 that is independent of the city center, Hoogvliet, Pernis, Rozenburg; Hejiplaat, and Hoel van Holland. Each of them with different and strong identities.

In landscape areas: Landscape spaces inside the municipal terms, a coastal stripe of dunes, and some polders outside the city.

The 2021 environmental vision not only focuses on greening developments, but also settles a vision in regards to the built, social and green elements of the city (the physical environment). Furthermore, this chapter of research aims to gather the most important actions and plans for what regards greening in the environmental vision. Along these lines, the research proposes to answer the question of **"What does greening mean for Rotterdam?"; in which nature is coined as *an object* (see greening categories) of contemporaneity, which the city uses to feed its identity as developed urban area. Furthermore as protection mechanism under the current climate changes.** This definition helps the investigation to understand the reasoning and decision-making behind the 2021 vision for Rotterdam.

The vision emphasizes the character of public space has in the city, as place to relax, entertain and enjoy both in the city and the region. As a consequence, the future plans intend to tackle the lack of effective public space evidenced in the inner city, due to the fact that, even though there are existing green spaces used by the population, not all of it is accessible or effective. In that sense, accessibility, effectiveness, and climate adaptation becomes a priority in the points for the greening agenda for Rotterdam. In a general view, the accessibility strategy is implemented by linking green spaces towards the boundaries of the city, with natural reserves and parks in the metropolitan area, by means of bike and pedestrian paths.

Likewise, the vision explores the benefits of green spaces that surround Rotterdam, as an opportunity to connect nature and animal biodiversity. However, ensuring the accessibility for inhabitants from the city to the reserves is not enough, plants and animals need to circulate in the region as well. These green connections ensure biodiversity flows from the city to the region, they can work as well as mitigation strategies at the urban level, objects for protection against precipitations that absorb rainwater runoff inhibiting floodings and overcharging the city sewage. Other benefits like reduction of heat stress through the exchange of air city/ countryside among others are perks that come by maintaining and increasing this connection and the natural reserves themselves.

The connection of water bodies is a topic mentioned as well in the environmental vision, it pays special attention to the two main ones (river Rotte and Maas) it explains their role as city arteries that connect it with the world. Furthermore, the vision for these two water bodies is to *"ecologize"* [13] them and make them more accessible to the coasts preserving the nautical function. Creating more accessible coastal areas could decongest the pressure of public space in the inner city, since it can direct citizen flows to the outer greening areas. In that order of ideas, the biggest challenges are:

a) Connect water bodies with better routes along and across the rivers.
b) Re-greening along the docks of bigger size either by additional trees, grass, and mixed plantations or by means of urban parks interventions.
c) Specialization of the different areas, making stronger the various programs in the different rivers.
d) Densification programs along and on top of the rivers (floating programs)

13. "Grimm et al. [2] and Pickett et al. [3] collectively make the point that it is useful to distinguish between ecology in cities and ecology of cities. The first refers to the study of fragments of nature within the urban context. The second refers to the study of the urban context itself as an ecological system. While this is an important distinction, pointing as it does to two quite diverse ways in which the idea of urban ecology can be taken, the concern here is more with ways in which cities themselves can be ecologized—that is to say, rather than trying to increase fragments of nature within urban areas, we need to be concerned with the pervasive replacement of built, grey infrastructure by natural, green infrastructure". (Vasishth, 2015, p. 11757)

On the other hand, the importance of creating effective public space is highlighted, by means of accessibility, in terms of recreation, leisure, among others. Moreover, the notion of effective, under the health benefits it brings to the urban environment and community. Accordingly, the vision faces a huge compromise with increasing greening through a better, more diverse, and larger vegetation incorporation, for a retrofitting relationship of benefits. This strategy maintains a constant dialogue with the densification process, densifying and greening the city as intertwined strategies, in theory have the opportunity to create a healthier and attractive urban ecosystem. For this reason, the vision pays special attention to this aspect and provides some tools to reach the goal of creating more effective public space. In the following years the urban focus will be turned to the following points:

a) Expand the greening where is needed, resolve missing connections, and making them adaptable to climate change like ground subsidence.
b) Improve the current diversity, natural values, and user's values.
c) Connect the green structure to the urban structure as a network for humans, animals and vegetal species.

By developing this strategy, the municipality intends to broaden the positive effects that greening processes. Prioritizing a pleasant urban landscape, by limiting the consequences of climate change like heat stress, providing shading, rainwater collection, and infiltration on the subsoil, furthermore contributing to the physical and mental health of the citizens. The 2021 vision not only proposes re-greening by using a more robust type of vegetation as a new is a strategy, but also providing new public spaces to re-green certain areas in the city. Under this light, projects like "the city 7 Projects", tackle green both in the center of the city and other districts in the periphery.

The environmental vision focuses on the necessity of amplifying the impact area for the new greening developments, primarily in terms of strategies for climate adaptation. Considering that most of the adaptation strategies are concentrated in the inner city (inside the dikes). The plan, proposes for new developments to protect the areas outside the dikes against ecological risks mainly floodings. To keep Rotterdam safe, the vision focuses in:

a) Providing greeneries for water storage and rainwater runoff
b) Real estate properties are climate-proof; i.e. green roofs for water collection.
c) Renovations and constructions flooding resistant.

Finally, it is clear that the vision stresses on the role greening as a tool (a reference to nature as a protection mechanism in terms of this research) in order to deal with climate adaptation. Under the same notion, the municipally coins greening as an element that feeds the identity of the city as a leader of contemporary solutions for environmental hazards.

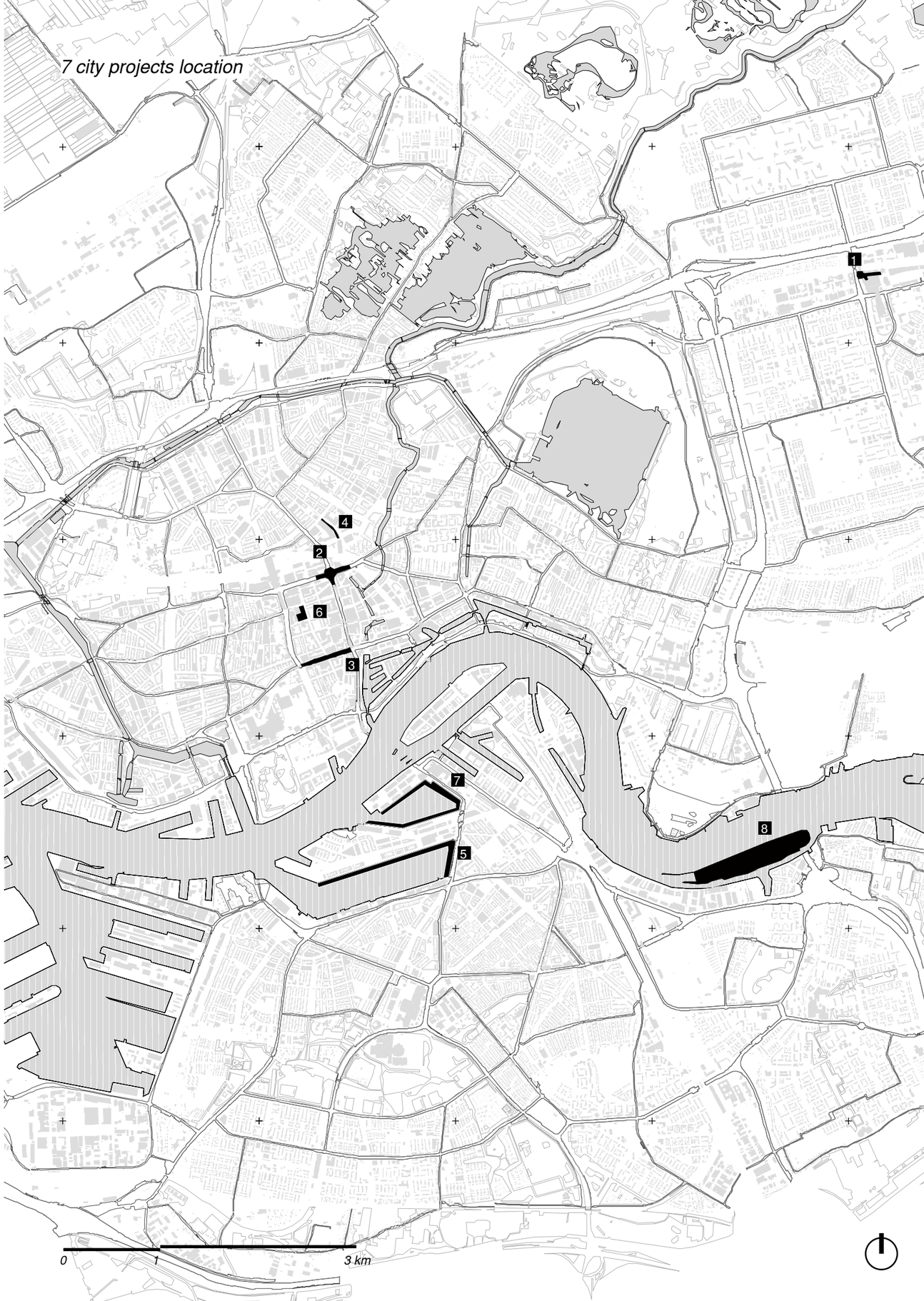
Image 11: The Power of Envisioning: Projective design as a tool for embracing radical change
Aikaterina Myserli and Henk Hartzema
Extrated from: *The Urban Transcripts Journal - Volume 4, no. 1 (2021)*

The City 7 Projects

Under the framework of the 2021 environmental vision, and due to the Coronavirus crisis, *“The city 7 projects”* emerge as a response, bringing the attention back to the public space. The municipality aims to develop seven urban projects to provide a higher environmental quality for the citizens of Rotterdam, described as “attractive public spaces where residents and visitors can gather, workout and entertain”. The projects are aimed to help Rotterdam to recover from the coronavirus crisis focusing on the future and creating solutions for the essential tasks of the city: reducing heat stress, absorbing rainwater rainfall, and building housing where it hasn’t been possible or where has been difficult to develop due to acoustic and air pollution. Aside for its main objective to create more extensions of green effective space, its aim is to provide employment and an attractive environment for business and tourism. The general environmental vision was used to promote this projects and create an integral proposal, in which, working together with the environmental vision principles, allowed to make objective decisions, directed to achieve the ultimate city’s plan. The seven projects of the city centered on the following goals:

a) Reduce Heat stress (urban heat island) up to 7 degrees Cº in the intervention areas.
b) Plant approx. 700 new trees.
c) Increase 100.000 m2 of green public spaces and provide the city with around 20 sport facilities.
d) Increase the areas for storage of rainwater.
e) Add 1700 bike parking spaces.
f) Conceive more spaces for culture.
g) Increase green roofs surface.
h) Reduction of air pollution, noise level, and increase air quality.
i) Provide around 25.000 new households.
j) Reduction of 21.000 kg of CO2.

For the analysis of the urban case studies, the exploration will focus on three of these projects, included in the *7 Project Plan*. All of these projects intend to make Rotterdam a greener city, being a key element in the translation of the vision mentioned earlier in the governance and policies section for greening processes. ***The objects of study for the Rotterdam will be The Rjinhaven, Feyenoord tidal park and Hofbogen.***



1. *Alexanderplein*
2. *Green long Hoffplein*
3. *Green long Westblaak*
4. *Hofbogenpark*
5. *Maashaven park*
6. *Schouwburgplein*
7. *Rijnhaven park*
8. *Feyenoord park*

URBAN GREENING

2.5
Urban Case Studies
Rotterdam

After settling on a clear picture of the present administrative management and governance around green infrastructures in the city of Rotterdam, the thesis dedicates the next portion of the study to take a look at its implementation on future urban projects. This approach is based on the fact that, even though, policies and reports from the municipality have a general saying on the future of green elements, the urban landscape is in many cases, shaped by specific urban projects that don't necessarily have a public interest as a priority. In the case of the city of Rotterdam the selection of the projects was strictly made from "The city 7 projects", which evaluates and assesses the general strategies in terms of the compact city, the healthy city, the circular city, the inclusive city and the productive city. For this reason, the next chapter will be dedicated to the analysis of a three future projects designed for the city of Rotterdam and their coherence and dialogue with the policies around urban greening.

a. The Rjinhaven

The Rijnhaven is one of the oldest ports in the south bank of the Nieuwe Maas, used in the XIX century as part of the port for the transshipment of bulk goods on electricity. Nevertheless, due to urban developments, the surrounding areas of Kop van Zuid and Katendrecht were drastically changed.

The area has been turning into a contemporary business and housing district that hosts most of the iconic and contemporary architecture pieces. The municipality adopted the "Rijnhaven Urban Plan on July of 2022", a document that sets the principles to shape the development of Rijnhaven into a district connected with the inner city. **The new developments proposed in terms of greening will be created in the following 10 years in, on, and along the port. In order to carry out this greening process, one-third of the harbor basin will be filled will soil in the northeast bank, creating an artificial beach that will serve the city of new urban natural landscape as well as the high-rise buildings next to it.**

Additionally, the floating parks that will be created on the quays on both sides of the Rijnhaven are connected by bridges, aiming to connect the citizens with the water. "Lots of greenery, water, and tall buildings will provide cooling in summer. The buildings will be 120 meters high on the park side and rise to 250 meters on the road side. There will be cheaper rental housing but also expensive houses for sale. There will also soon be shops, restaurants, workplaces, and leisure facilities." (Gemeente, 2023)

The report of the 7 Projects for the City, settles some objectives they want to achieve by developing with this particular project. Under the scope of the environmental vision principles (compact, productive, circular, healthy, inclusive).

Compact City

The complete project of the Rijnhaven is being rebuilt into the most compact district of the city, including 2500 new households and an urban park of 8 ha, out of the total developed area of 21ha, and a mix of spaces for business, accessible and a entertainment connectivity center.

Healthy City

The project is in the inner city, where the lack of effective public space is clear. Moreover, new park recognized the water quality as a key factor, by concieving it as a resilient project, in which the vegetation is positioned on top of the water as floating parks, contributing to the reduction of heat stress. The park itself will consist on portions of floating docks that move up and down depending on the water level.

Inclusive city

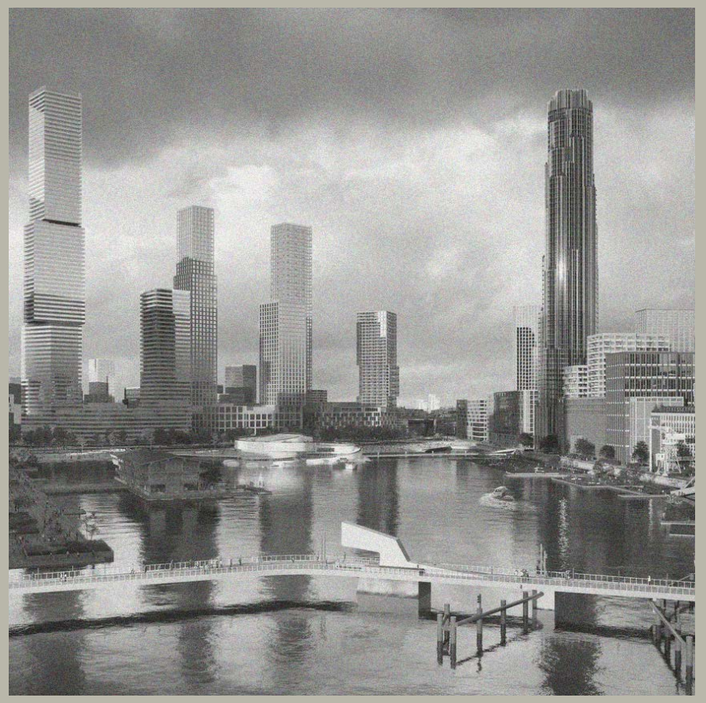
A mixed neighborhood is being developed in which a combination of highly functional dwellings for several target audiences is attracted.

Productive City

The project targets the construction very attractive buildings, making it an ideal place for a competitive and innovative district, offering commercial, offices, and even spaces.

The generation of artificial land is a characteristic that makes greening process in Rotterdam unique. Additionally, the project is strictly aimed to achieve goals related to the current notions of the "sustainable city".However, the cost of bringing new natural resources to generate land, creates a huge challenge in terms of econimic return. This is implicit in the design waterfront, in which new large scale business and touristic infrastructures have to emerge in order to make this vison sustainable.

***Masterplan Architect**:*
Barcode
Related Architects:
Mecanoo/ MVRDV/ Powerhouse company/ Winhov.
***Area:** 350.000m²*
***Year :** 2019*
Main greening strategy:
floating greening, artificial land
Architectural program:
Housing, offices, parks



b. Feyenoord Tidal Park

The idea of creating a new tidal park in the outer bend of the river Nieuwe Maas between Eiland van Brienenoord and the Mallegatpark, was first contemplated in the Feyenoord city master plan and the program “the river as a tidal park”. This masterplan contemplates an important portion of the stadium park project promoted by private developers, who are also responsible for The Feyenoord Tidal Park, in cooperation with the municipality. The future park is situated in a unique position, the connection between the river and the sea (Dutch Delta), this means specific conditions of biodiversity due to the exchange of fresh and salt water.

The project of Feyenoord intends to be a natural experience, with its tidal features and especially emphasizing the connection with water, making the park an ideal spot for recreation. The total area of the project includes housing, sports facilities, catering and hotels, next to the construction of a new stadium for Feyenoord.

Regarding greening, the project proposes strategies to green and reuse old parking lots, in order to create attractive parks and squares. The project will have an extension of 3 ha, with tidal nature and recreation opportunities, serving a big part of the community, specifically the ones in the south. In the south of the urban fabric, the river plays an important role in the creation of new ecologic qualities and urban ecosystems. In addition to recreational and leisure areas, the design features sports facilities. The project will be added to the existing park and sports areas, already developed for the public space intervention called the “emerald Belt”, intended to be an ecological connection with a high environmental value for its tidal special biodiversity. This project contributes to the natural condition of the water, offering a relation between nature and city.

The main goals the municipality aims to achieve in terms of sustainability, by developing the Feyenoord Tidal Park are: new natural connections, create a unique tidal park, place the Stadium as landmark, generate good connections with surrounding neighborhoods and a place for business and recreation.

Compact city
This project fits into a wider urban restoration bet that aims to diversify uses in the area with households, offices, entertainment, and greening interventions. Besides that, another contribution to the compact city pillar from the environmental vision, consists on removing the parking lots replaced for attractive public spaces, promoting the use of public transport and gathering activities.

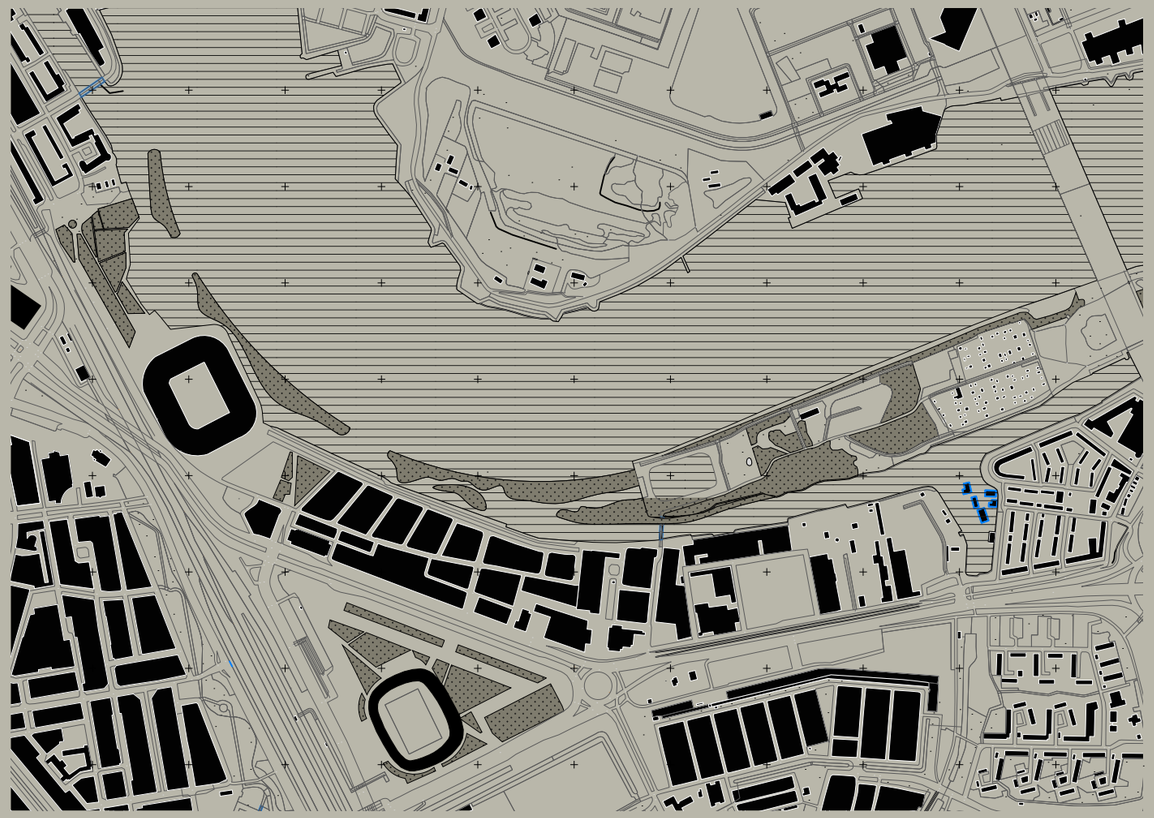
Healthy City
Adding vegetation to the city for recreational purposes through a tidal park increases biodiversity and improves the water, air, and sound quality, reduces heat stress and increases convenience on water bodies care.

Circular City
Carrying out this project will contribute to Rotterdam´s CO_2 neutrality, is easily accessible with walking and biking distances. In addition, the project proposes strategies for circularity while under construction like the reuse of sand from other projects like the Niewe waterweg.

Inclusive city
The project increases the greening areas to a piece of the city that lacks of greeneries, this increases the accessibility to effective public space to citizens from all the city and especially serves of benefits to the south neighborhoods

Productive City
Contributes to a more attractive business environment related with maritime transport and fit perfectly with the port city of the future.

***Landscape Architect**:*
LOLA
Related Architects:
OMA
***Area:** 100 ha*
***Year :** 2020*
Main greening strategy:
Tidal park, artificial land
Architectural program:
Sports facilities, park



c. Hofbogen Park

The Hofbogen railway is located in the center of the city, the location regards the old viaduct. With time, the viaduct became an urban national monument, it crosses various districts which are highly populated. The Hofbogen is developed on top of the old abandoned infrastructure as 2 km long urban park that runs all through Rotterdam north.

By building the Hofbogen Park, the city would be tackling the urgent necessities of the citizens, as an integral response, given that the park connects the inner city with the greeneries that surround the the rest of the urban fabric. This particular project is part of a piece of the city that includes greeneries with a big ecologic potential and a smart and circular water system. In this sense, the Hofbogen Park contributes to the city ambitions in the climate change adaptation.

The new development is designed to offer opportunities to connect different urban areas, for instance, the Pompenburg and the dock block of the Schie, create a unique route to walk without obstacles from the northern districts until the central station. Hofbogen makes the most of the proximity with the city center.

The report of the 7 Projects for the City, settles some objectives they want to achieve by developing the Hofbogen Park. Under the scope of the environmental vision principles (compact, productive, circular, healthy, inclusive). These objectives wich to: generate 2 Kilometers park, develop new recreational routes and paths, develop new playgrounds and entertainment routes, conceive Green elements as water retainers, create New routes to work cores and centers, strengthen green and blue structures in the city and increase biodiversity.

From the environmental vision perspective, the city hopes to meet its objectives in the following way:

Compact city
The Hofbogen Park is a greenery of high standards and quality according to the plans, with short walking and biking distances. Even though Hofbogen is being conceived as a new green addition to the city, it is being densified, in order to follow the main objectives of the municipal environmental vision, where it is said that greening and densification should go hand to hand in greening urban processes.

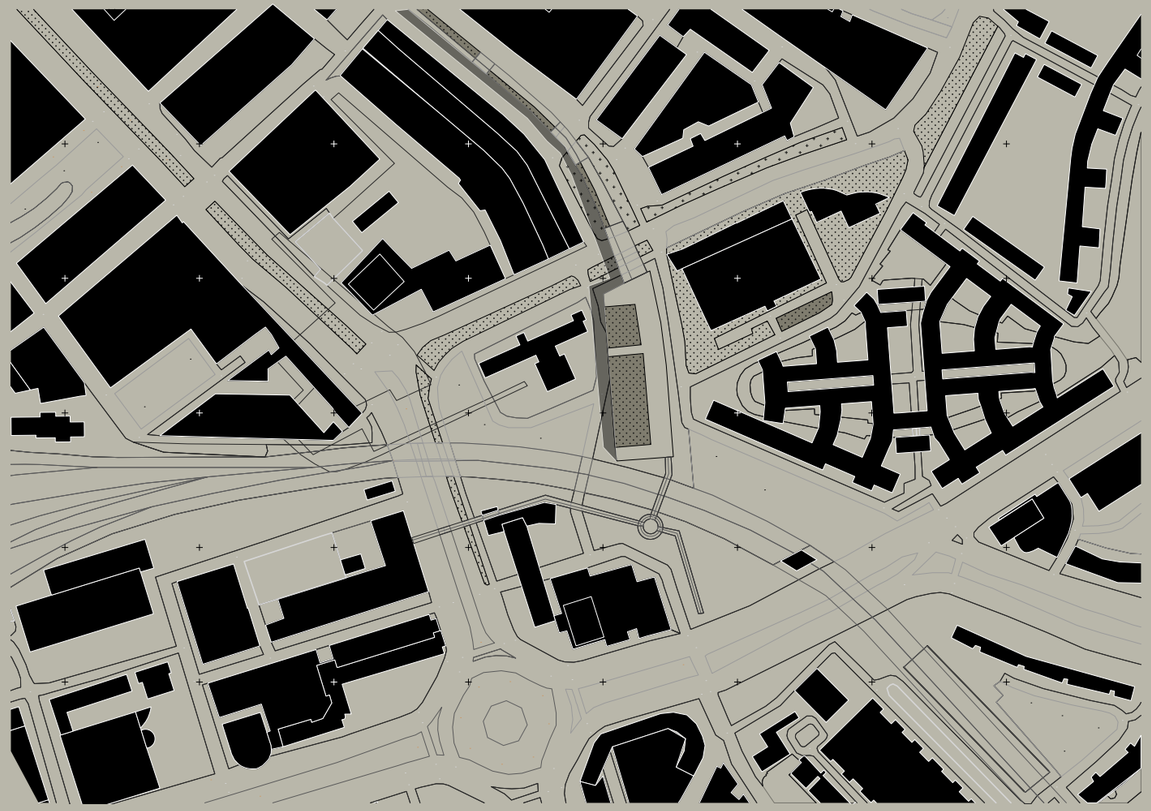
Healthy City
A linear park of 2 km contributes to the physical and mental health of citizens and reduces air and sound pollution.

Circular City
The Hofbogen Park itself, represents the reuse of an old viaduct that is becoming a landmark in the city. In addition, contributes to the rainwater absorption that can be collected for gardens irrigation, cooling, and keep humid the wooden pillars.

Inclusive city
In order to promote a social cohesion park, maintenance is proposed as a communal initiative where the community and neighbors can contribute to appropriately maintain the public space.

Productive City
It contributes to a more attractive business environment and connection to the functional cores of the city. It increases the overall property value by working on the aesthetics and safety of the area.

***Architect**:*
DoepelStrijkers
***Lenght:** 1.6 km*
***Year :** 2009*
Main greening strategy:
Recovery of old transport infrastructure
Architectural program:
Parks and Gardens



2.6. Considerations
City of Rotterdam

After taking a detailed look at the green governance, policies and their correlation with future projects of the city of Rotterdam, the research proposes a series of considerations in order to bring light to some of the most relevant and critical aspects of the current approach to greening process. When it comes to the future visions for greening, the urban policies that direct the management of green elements in the city seem to agree on the fundamentals as regulating mechanism. Moreover, given the city historical past and more importantly the post-war destruction, the regulations make a significant effort to concentrate on future visions and revolutionary solutions, given the complexity of Rotterdam as a Delta city. In this order of things, it has been found the Greening processes in the city cannot be detached from the unique water management over its historical expansion.

Furthermore, the critical geographical position of the city has been a conditioning element not only for Rotterdam, but for the Dutch panorama overall, reinforcing to the perception of nature as a risk. **Subsequently, Rotterdam understands green infrastructure as an object that can contain the impacts of climate change and provide benefits for the urban fabric.** Moreover, understanding that in this particular case, greening processes merely derived from the relationship with blue infrastructures and the future vision of the city. Under this perspective, the city has established a clear regulatory framework of the sustainable goals and green vision for the future, based on protection mechanism and functional urban relationships. “This, however, does not imply a flawless policy and planning structure to deal with the complex issues of urban green and blue infrastructure. In the transition of the city to modern governance, multiple processes and ambitions create systemic complexity” (Frantzeskaki N. Tillie N., 2014, p. 545).

Green Gentrification

Regardless of the countless efforts in the policies “Rotterdam goes green 2018-2022” and Rotterdam´s 2021 Environmental Vision, a big portion of the urban landscape will actually be shaped by the large scale projects proposed by “The city 7 projects”. Within this plan, the projects reflect an aligned vision with the main greening projects, however, there are emerging issues that come along with these types of urban renovations. As it is expressed by the *Thesis Environmental Justice in Greening the Hofbogen,* in reference to one of the greening urban case studies for Rotterdam Hofbogen Park:

“Several aspects are considered as justice issues in urban greening. Firstly, greening projects could be prioritized in areas with high-income groups. Secondly, the low availability and quality of the green spaces in low-income neighborhoods contribute to poorer health and living environment. Also, the exclusion of typically marginalized groups could take place in the procedure of urban greening. Finally, there is also a paradox with urban greening in terms of gentrification, or in this context, green gentrification. Greening projects can make areas more attractive and livable, and set off rounds of gentrification that can drastically reduce housing options and can drive out low-income groups (Wolch, Byrne & Newell, 2014)” (Vleesenbeek, 2022, p. 7).

Hofbogen Park as a project, plays a characteristic role on tackling green public space on residential areas that located in the north of Rotterdam. These residential areas face a lack of availability in terms of green elements, in comparison the gray infrastructures present. Moreover, this disproportion of green and gray bodies has increased the Urban Heat Island effect, as it has been described by the residents within the communal meeting for the project. In this sense the park is an opportunity to improve overall life quality and act as a mitigation strategy towards clime issues. Nevertheless, the context and background of the project, makes it a perfect environment for processes of gentrification to emerge and hide behind the general positive effects that the park might bring. As Zuza Nazaruk question in her article “*Can Rotterdam avoid green gentrification and become a climate-adaptive city for all?”*

“Hofbogen is a great example of government-driven gentrification,” architect Vollaard asserts. Less than a decade ago, when the trains stopped running and before the Dutch real estate firm Dudok Group acquired the tracks, the area was bustling with small businesses. “Those places are not available anymore,” Vollaard states.

The neighborhoods linked to Hofbogenpark offer more job opportunities now. Yet, whether job quality compensates for price increases is a much more complex question. The park will open in 2024. “We need to ask whether the park will bring gentrification in the neighbourhood,” van Ham says. “Or is it already happening? (Nazaruk, 2023)

Even though, Hofbogen Park is aligned with the general sustainable vision of the city written terms, it is possible that projects at these scale can be overlooking emerging phenomena, that come with the improvement of the life quality of the area. When working on such a large scale it is difficult to have specific and sensible approaches to the possible urban inclusive relationships, even more when thinking about them in future scenarios. On the other hand, the general promise of sustainability and economic retribution makes it even harder to rethink the values that constitute the project and ultimately shape the final outcome. For instance, the attention to urban biodiversity and the role of spontaneous nature has been overlooked as one of the possible reaches of the project, barely mentioning the intention of creating an inclusive urban ecosystem. Without saying that the park has the potential to bring benefits to the surroundings of the intervention, it is possible that the collateral effects are a symptom of a generalized and mechanic approach towards achieving the goals established in the municipal policies.

Land Reclamation and Greening

When talking about the urban infrastructure of Rotterdam or even The Netherlands, it is inevitable to notice two particular processes in their urban expansion, the first one their countless efforts to manage water bodies and prevent floodings, and the second one that gains strength by the minute, their achievements when it comes to land reclamation#. As a municipal and national process of urban expansion, this mechanism cannot be detached from greening process, given that the production of artificial land, furthermore requires the construction of residential, commercial and green areas that sit on top of these new portions of the city.

Going back to the research on the urban case studies, the “The city 7 projects” is not an exception to the production of new artificial land. With the project of the Rijnhaven, the city proposes to fill one-third of the harbor basin will soil in the northeast bank, creating an artificial beach that will serve the city of new urban natural landscape, in addition to the floating parks that will be created on both sides of the Rijnhaven. Even though the research on the social and environmental effects of land reclamation in the Dutch urban areas is limited, it is not the first time the city has gone through such a process.

In 2013 the area of Maasvlakte 2, was finally open in order to reinforce the ports position in the international context. However, the original timeline took 13 years more than expected due its controversy around its processes of land reclamation. The project was mainly intended to generate land for the city and regain control of the coast and constrict new project areas. Nonetheless, the environmental impacts of this operation left a huge question mark on the real life implementation and balance in the ethics of the intervention. “Although Dutch environmental law required consideration of environmental impacts, it remains questionable whether MER procedures and public participation in fact altered the plans of Maasvlakte 2 or were merely a box that needed to be checked, as prevalence of the ‘wider’ public interest was an overriding legal argument in the decision-making process”(van Gent, 2014, pg. 57).

Within this context the project of the Rjinhaven faces a huge challenge in terms of the production of land for the new project and consequently the environmental conditions that surround it. Considering that the land production is justified, once again, behind the economic and functional remunerations, it seems a natural solution to the lack of space around the port. However, as it was revealed for the Maasvlakte 2 project: “Artificial land allows for industrial development outside densely populated land, evading many risks that come along, however new risks unveil. Artificial land creation for harbour infrastructure can severely impact surrounding marine and land ecology and the ecosystem as a whole. Maasvlakte 2 was opened in 2013, 13 years later than originally planned”. (van Gent, 2014, p. 44)

Under this perspective, the greening process around the Rijnhaven, seem to be highly artificial, producing a completely new urban area on top of existing natural infrastructures that could possibly be rethought as natural urban ecosystems. However, this types of questioning are not even mentioned in the policies or project challenges, due to the string historical heritage of the city in regards to water control. Moreover, the policies still prioritize adaptation and mitigations strategies, urban expansion, ecosystem services and even economic retrofitting over natural greening process that could emerge from a more sensible intervention.

Image 12: Energy-neutral floating neighborhood in Rotterdam waterproofed with RubberGard EPDM, Examples of gentrification processes in Rotterdam.
Public Domain Architects (PDA), (2019)

Image 13: Katendrecht, Examples of gentrification processes in Rotterdam.

Image 14: Powerhouse Company, floating off-grid office, Rijnhaven port.
Examples of gentrification processes in Rotterdam.
Crook L. (2020)

Adaptation and Mitigation

Along the lines of the artificial production of green elements, a strong emphasis towards adaptations and mitigation strategies is evidenced. With emerging issues such the urban heat island, the focus of urban protection mechanism turns to green elements. As it is clearly explained in the policy “Rotterdam goes green 2018-2022”, green roofs and restructuring of green existing areas are a priority in order to make the city greener and more resilient. Nevertheless, the research identifies two primary issues, the first one is the equity in the distribution of environmental risk, and therefore the greening processes against it; and the second one the single artificial character of new green elements in the urban fabric.

Going in depth on the first issues, it has been identified that the strategies for climate adaptation such as green roofs and restructuring of former industrial and brown areas, are mostly concentrated in the inner city. This is due to the fact that the main transformation areas for greening process and new interventions in Rotterdam are, based on their potential to attack business, tourism and real estate developments. The greening initiatives are mostly concentrated towards the inner city and the port, leaving residential areas towards the outside vulnerable to climate change issues.

The second issue in regards to climate adaptations strategies, is the artificial characterization of all solutions. Firstly, artificial solutions require maintenance and management to keep them running, given that they are an insert to the existing urban fabric and not a natural process that can survive on its own. In this sense the accessibility and conservation of elements such as green roofs, or even the so-called nature based solution require a deeper reflection around their relationships with the community. As it was question by the residents of the area around the intervention of the Hofbogen Park in one the communal assessments of the same article previously mentioned. “Not really a burden but more of a missed opportunity seen by an urban architect is the lack of room for nature to grow (wild nature). The whole natural system is designed, and this is not seen as real nature anymore. This is a missed opportunity for a representative natural system, also because there is no brown and dry part designed (Interviewee 5, personal communication, 2022)” (van Gent, 2014, pg. 59).

It is possible that the technological revolution on greening processes might not be completely aligned with the relationship the community is looking for. As they expressed, they want to be a part of maintenance of the park, however they question the decision of dismissing wild urban nature as a paradox. Neglecting non - human species from the equation of future urban ecosystems is once again an idea that refers the vision of nature back to the object. Under this light, it could be possible that the contemporary approaches to greening and climate mitigation see ecology as an aspect on the checklist for planning, which that needs to be ticked off rather than as an integral part of the planning and designing process.

Greenwashing

As the research approaches the reality behind the connotation of greening in Rotterdam, the reflections of the objectification of nature cannot seem to escape the future panorama. Even as the city redirects it policies, projects and visions towards a more “sustainable” approach, the analysis of the case study has revealed that economic and functional values still prevail over any type of urban relationship. This in great measure, has been possible thanks to the discourses and dialogues that sustain the green city is inherently good for the urban future. Among this practices, Rotterdam presets a clear case of Greenwashing [14], in which the connotation of green is used to develop large scale projects with the excuse of providing benefits and sustainable relationships overall. Nevertheless, the article “*Potential nature-based solutions and greenwashing to generate green spaces: Developers’ claims versus reality in new housing offers, questions the rhetoric that sustain green discourses”*:

“Developers try to mitigate the social resistance caused by their negative influence on urban natural resources through extensive marketing strategies concentrated around greenery. However, it is unclear whether it is a real attempt to introduce NbS in the city and enhance residents’ well-being, or it has only been implemented in response to the environmental compensation required by law, or perhaps solely greenwashing (GW), or both in different proportions”. (Gałecka-Drozda, Wilkaniec, Szczepańska, Świerk, 2021, p.2)

As it has been made clear throughout the research, the connotations and discourses behind greening and nature are much more powerful than what contemporary reflections around the city, would like to admit. In this sense the influence of Greenwashing in projects such as the Rijnhaven, Hofbogen Park and The Feyenoord Tidal Park previously discussed in the case study exploration, are quite evident. It is ultimately the blind faith in the present notions of green that doesn’t allow greening processes to drift apart from the objectification of nature, which has been taken place irreversibly since the industrial revolution and the post-war landscape of Rotterdam.

14. Along with the assessment framework, we provide an operational definition of greenwashing, which is intended to encompass a variety of misleading communications and practices that intentionally or not, induce false positive perceptions of an organisation’s environmental performance. (Nemes et al., 2022, p. 2)

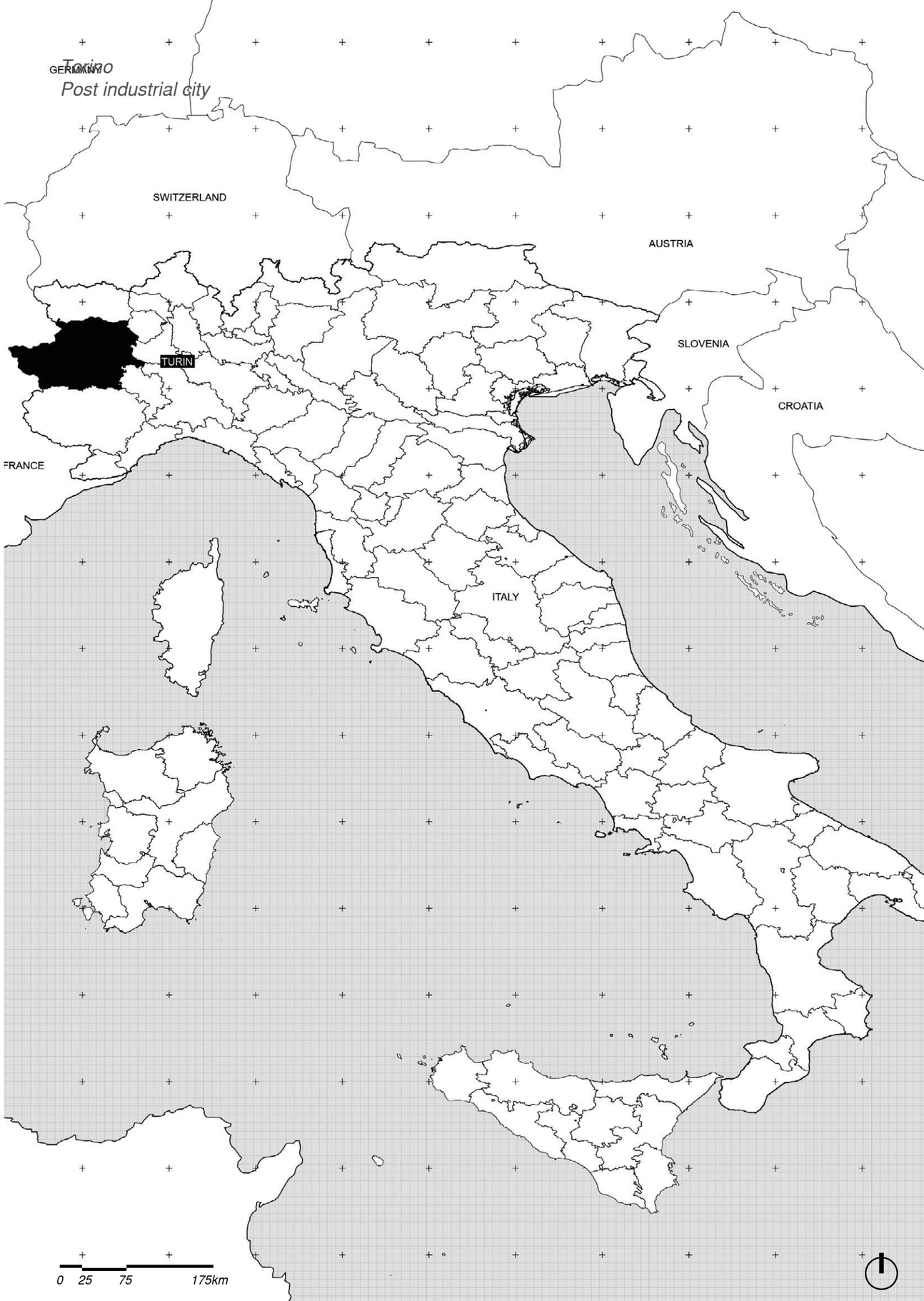
Cap 3.0.
Torino, a case study

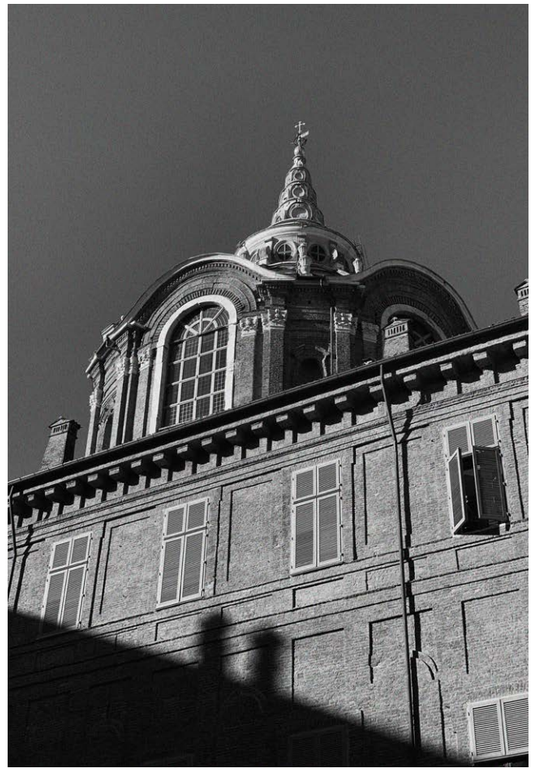
3.1. Contemporary Urban Framework: City of Torino

Following the line of research, the investigation proposes the application of the theoretical findings in the city of Torino. The city has an undeniable connection between the expansion of the urban area and the conception of green elements during several crucial moments of its history, given its strong industrial heritage. Moreover, the thesis frames Torino as a city with significant potential regarding the future conception of green infrastructures, in the pressing environmental and social crisis in modern-day cities. Within the Italian national framework, the recognition and approach of the ecological value of green infrastructures has been brought to the table as a main guideline concerning the treatment of green bodies, in the city's ongoing transformation. The acknowledgment of value in the natural elements of the territory, has become a crucial to redefine the role of urban and metropolitan green, aiming towards establishing the importance of ecosystem services in the regional and urban landscape. Under this perspective, the region of Piedmont is no exception to this approach identifying the immense potential in the integration of the metropolitan and urban green infrastructures (UGI). As Voghera and Giudice (2019) describe in their article regarding *Evaluating and Planning Green Infrastructure:* "The regional landscape plan of Piedmont, the Region in which our case study is located, identifies a network of landscape connection, a multi-purpose and multifunctional system which combines ecological elements (nodes, ecological connections, and restoration areas) with historical and cultural ones" (Voghera, Giudice, 2019, p.12).

Torino, is located in the northwest of Italy, south of the Western Alps, in the region of Piedmont, being a crucial urban area within the regional and national Italian plans. Identifying its unique geomorphological characterization in the global picture. The strategic plan for green infrastructure of the city helps to understand this, since it proposes a territorial structure in which, the metropolitan area can be divided into three morphological units:

1. the hills and foothills areas
2. the plain area crossed by the Po, the Sangone, the Stura di Lanzo; and the Dora Riparia River
3. the streams and rivers that derive from the hills.





Pictures taken by the authors

Torino is surrounded by the crown of the Alps and flanked by hills, it spreads over an area of 137 km², occupying about 2% of the territory of the Metropolitan City of Torino (CMT). As identified by the municipality, the city presents a special condition in terms of natural composition, with four rivers and their corresponding ecological corridors, a set of hills and foothills that are composed of forests and cultivated areas, and the urban green elements that can be found within the urban perimeter of Torino. The river axes, in fact, in particular the torrential ones of the Stura di Lanzo and Sangone act as a connection with the neighboring green areas: Parco della Mandria to the north-west and the natural park of Stupinigi to the south, with the respective foothill areas of Lanzo Torinese and Avigliana.

Greening the One Company Town

Considering all of the elements that are part of the equation in the natural urban context of the city, it is crucial to highlight the shifting perspectives of the vision of urban green throughout history, especially identifying the most recent perspective which brings the city out of the Fordist landscape, as a critical point in terms of ecological, economic, political and social condition, leading the city to rethink its relationships and development of the green and gray infrastructures. As described by Caruso, Pede and Rossignolo, in their article "*The Reinvention of Turin's Image"*. "Since the 1950s, the city has distinguished itself as a one-company town in the automotive sector. However, the collapse of the Fordist model in the 1970s led to a rapid reversal of the city's fortunes. Since then, efforts have been made to restructure the economic urban agenda and rethink urban development" (Caruso, Pede and Rossignolo, 2019, p. 6).

Given its industrial past, the city has a strong history of neglecting its natural structures, by prioritizing its functional and economic growth. **As it has been discussed from the beginning of the research, it is the industrial era that marks a non-return point for the objectification of urban nature, in which the urban body of Torino is no exception.**

With this rupture between nature and society, abandoned industrial sites, wastelands and degradation became binding element in the post-industrial landscape of the city. In this order of things, the decline of the industrial city, the emerging environmental issues and the economic and social crisis, has forced Torino to rethink their relationship with green. As it is exposed in the article "*Setting up a university city. Geographies of exclusion in North Turin".* "Turin, which was mostly known as a typical one-factory town (due to the former automotive manufacturing company FIAT, now Stellantis), has gone through a redefinition of its urban economy since the beginning of the 1980s, leveraging on culture, creativity, 'smartness' and the service sector" (Rossi 2015; Vanolo 2015; Gonzàles et al. 2018; Ponzini & Santangelo 2018, p.4).

Along these lines, the search for new ways of producing the city and the conception its relationships has become a priority, allowing the new models of expansion to work back to back with ideas such as "sustainability" and "green as an infrastructure", promising to regenerate the industrial footprint. These concepts have become the reflection of the existing policies and plans that direct greening processes in Torino, making a new effort to quantify and conceive them in a new fashion. However, the historical evolution of green elements, remains the key ingredient to understand the truth behind existing notions of urban nature. Moreover, the application of the theoretical framework, based on the transitions that derive from the subject to object dichotomy, in such a context. With this introduction, the study continues with the revision of the city's greening history, to better understand the exchanges and relationships that constituted the green infrastructure as is known today, in a city like Torino.

Image 15: Dora Park, Industrial Regeneration Process.
Zagor E. (2019).

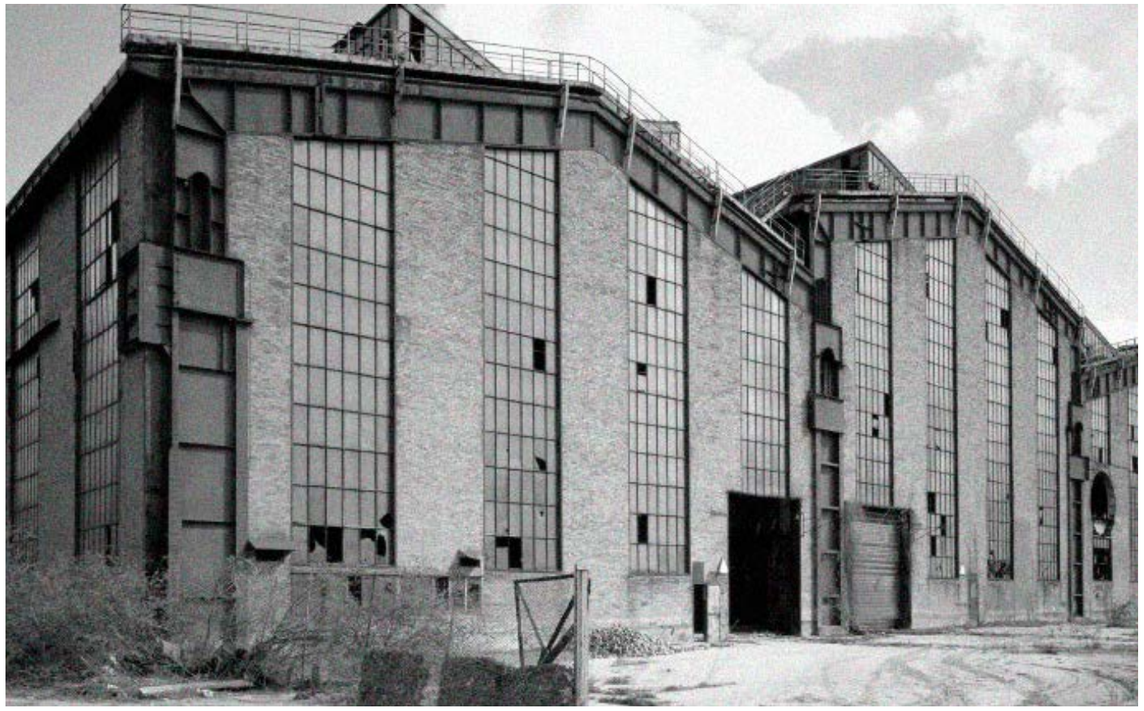


Image 16: The front of the rolling mill sheds, .Ex Teksid, ex Ferriere Fiat Ingest.
Filippo Gallino, City of Torino, (2000).

Image 17: Officine Grandi Riparazioni , Abandoned Urban Industrial Areas, Present day OGR.
Loscrivodame Rimini, (2018), Torino.

3.2. History of Greening: City of Torino

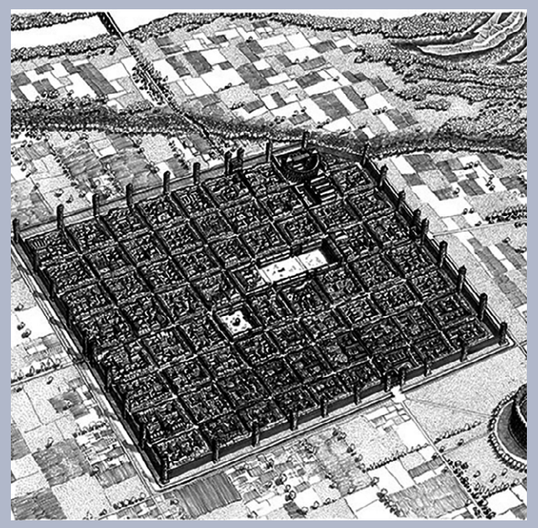
Italy

Piemonte

Torino

To fully comprehend the greening panorama, it is necessary to set a historical framework of greening throughout the temporal dimension. Torino has historically been positioned in a strategic node as a delta city, located in the Maas River in connection with the North Sea, meaning that has a maritime connection with the rest of the world, however, its position has been a hazard in terms of natural disasters, specifically floodings. Measures have been taken throughout history to mitigate nature action in the city.

Mid 1500s



Augusta Taurinorum

Initial Trace

Until the mid-1500s the trace of the city was not significantly different from the Augusta Taurinorum, as the original roman trace. The perimeter was enclosed by fortified walls in which the compact urban space was developed, with mostly one main green space, the Giardini Reali and there was almost no trace of urban trees.

(1559)- 1700s

1634, the first nucleus of the gardens belonging to the new Ducal Palace, extreme outskirts of Savoy Turin.

Historical Green
Infrastructures

The relocation of the ducat of Savoy allowed the requalification and expansion of the urban area to the south, east, and west. Until the 1700s, it contributed to the creation of royal properties for leisure and hunting to the peripheries of the city, known as “corona di delizie”, which will later take a leading role in the characterization of public green infrastructures in the metropolitan context.

In this particular period the Historical green infrastructures emerge, creating Regio Parco, il Castello del Valentino, la Villa della Regina, l’attuale Villa Abegg, i Castelli di Moncalieri e di Mirafiori, la Palazzina di Caccia di Stupinigi, la Reggia della Venaria Reale, il complesso della Mandria

Begenning 1800s

View from Monte dei Cappuccini,Photograph from Istituto Italiano d’Arti Grafiche, Bergamo

Greenways

At the beginning of the 1800s, during the Napoleonic invasion, the walls of the city were torn down and the urban area opens up for the development of the city. During the period of the French regime, a series of roads/streets with trees were created as a network that surrounded the city with recreational and aesthetic.

“Promenades publique”, today known as greenways became part of the green heritage of the city. Being the main green effective public space in the 1800s. Later on, these greenways gained relevance in terms of connection, defining the accessibility between the historical green assets, such as the royal properties, and the rest of the city.

Mid 1800s

Il Po ed il Castello del Valentino

The idea of the public garden was initially introduced at the beginning 1800s, however, it was until the mid-century that the first public gardens started to emerge.

During the second half of the 19th century they were born the first public gardens in Turinil parco del Valentino, il giardino dei Ripari, il giardino di Sambuy, la zona della Cittadella. The expansion and use of the Parco del Valentino for national and industrial expositions was carried out towards the end of the century.

3.2. History of Greening: City of Torino

Italy

Piemonte

Torino

First Half 1900s

parco d'Italia '61.

Hill Parks

In 1913 the Parco del Valentino was the only large scale green space of the city, however, not being sufficient to answer the necessity of the increasing population, with this the creation of a plan for the development of green areas was created. Most of the projects developed within this time period responded to the creation of parks placed in the hills surrounding the city.

The main parks within the inside of the city where Valentino Nuovo e the Parco della Pellerina crossed by river Dora. After this interventions, the panorama of green public spaces remained mostly the same for almost half a century, with only a few exceptions, the first hillside parks were also created, the Parco della Rimembranza, the Leopardi park and the Europa park. Turin-Superga panoramic road was built and the Parco d'Italia '61 where created, for the celebrations of the centenary of the unification of Italy.

1970

One Company Town: Fordist Boom

The Post - Industrial Lanscape

Due to the industrial expansion in the automobile sector, the city experienced an urban expansion based in the economic dimension. In the beginning of the 70s the whole urban territory was ruled by the industrial sector, leaving the ecological interests aside, however, by the end of the decade, the city experienced a quick deindustrialization, which was in great measure influenced by the definitive closing of Fiat Lingotto in 1982.

1980

Current Greening Plan

New Plans and Regulations

For this reason, the focus returns to the requalification of the post-industrial city and the peripheral areas that emerged in the industrial boom. The main objective was to tackle the areas around the water bodies of Torino and create an organic system of parks. The first proposals came from the Plano Regolare Comunale in 1980: Rapporto preliminare di Studi sul Sistema Verde 1983. Within this framework two subsystems were proposed in terms of urban green:

1. "Sistema Verde Azzurro" (4 main water bodies that cross the city, Po, Dora, Sangone, Stura di Lanzo) (Attuale Torino Città d´Acque)

2. "L´Anello verde"

The initial recognition of natural urban assets, was key for the creations of a series of policies and proposals that which to reshape and rethink the relationship with green elements in the emerging vision of the sustainable city.

1990 - Today

Present Regulatory Framework

New Plans and Regulations

Following the new redevelopment vision, the city proposed an approach, in which, for the first time, the green elements where considered as part of the urban infrastructure. According to the new PRG (Piano Regolatore Generale) approved in 1995, new transformation areas are indicated hoping to regulate not only the existing territory but also the future development of the city.

The plan targets a compact city model but also taking into account the urban green, and the use of previous industrial areas. This allows the creation of the Spina Centrale. In this plan, the urban green considers the network of green "roads or pathways" that emerged in the Napoleonic invasion, the pathways that connect the city with the historical green assets from the royal era, and the blue/green axis of the city.

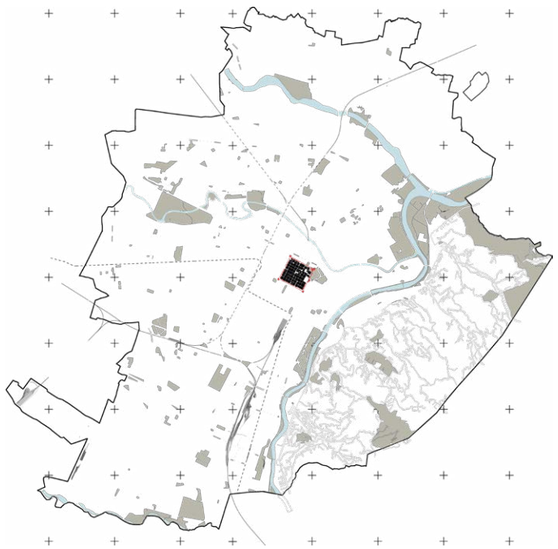
Within this framework there are two main projects that describe the objectives from the urban green in Torino: Torino Città d'acque (1993), Corona Verde (1998)

Italy

Piemonte

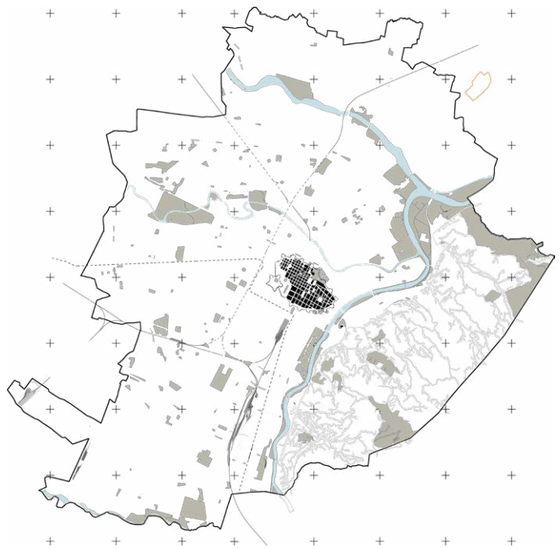
Torino

Mid 1005s



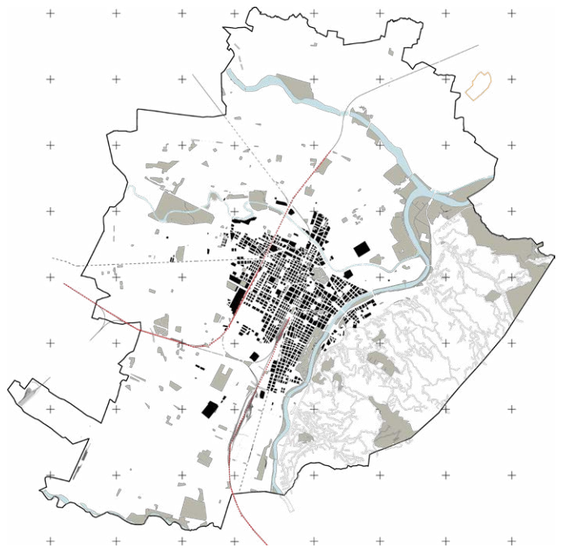
The Ancient Regime

1700



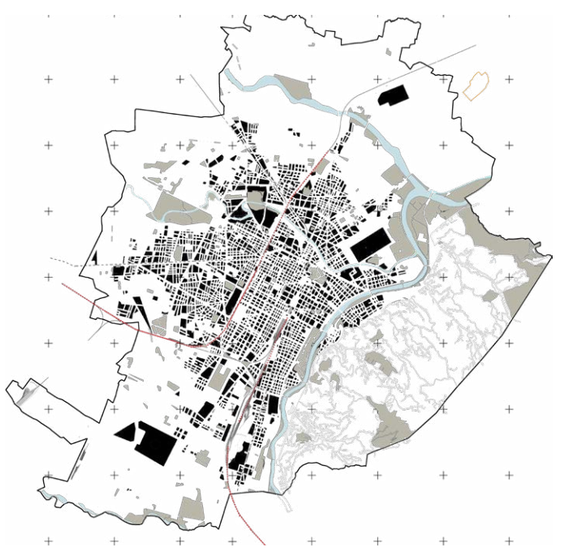
Ducat of Savoy

1800



The Industrial City

1900



The Post- Industrial City

Urban expansion in the city of Torino in relation to the morphological growth around green bodies.


Turin - current urban situation
0 0.2 0.7 1.7km

3.3. The Greening Mechanism: Torino

Having settled a framework for the historical development of green infrastructures in Torino, the research proposes to analysis the management structure implemented by the municipality for urban greening. This next section of the study, becomes relevant to the research given that, these regulations are the main mechanisms to define the present and future vision of green elements. But more importantly, the exploration wishes to bring light to the question of ***How does Torino define Nature, and consequently Urban Greening?***

Starting from a general perspective, in the case of Torino, and according to the municipallity, the green system is composed of 48.000.000 m2 of green area, considering both public and private spaces. In terms of quantification of green area per capita, the city has a value of 55 m2, staying within the standards recommended by international and European entities. Furthermore, the green areas have specific uses assigned, from which the reports highlights 12.5% of cultivated green and 20% which correspond to forest areas. One of the main characteristics of green spaces regards to the type of administration, in which 38% is public and 62% is private. In public terms, the amount of green area circles back to 20 m2 per capita, which is above the mean in the European union, from which 11.000.000 (60%) are destined for recreational use as a key point of action for greening strategies.

The transversal relationship between green elements and the historical expansion of the city, the municipality understands linear green as a strong point, being a shaping element in the connection of the city. Specifically regarding vegetation, Torino takes pride in its heritage of greenways, which initially date back to the Napoleonic invasion, but now reach an approximate of 110.000 trees, from which 60.000 are placed along the sides of roads that structure the main mobility infrastructure of the city. Moreover, the municipality identifies three main elements that compose the overall green infrastructure in the city, the trees, the hills (including parks, cultivated areas and forests) and the ecological corridors that directly correspond the fluvial axis of the rivers in the urban perimeter. This third element, puts Torino in a critical position when talking about sustainability, regarding both green and blue urban infrastructures.

As it is described by the *“Strategic Plan for Green Infrastructures of the City of Torino”*, the city “fits into a context metropolitan area of strong ecological and naturalistic importance mainly formed by the relationship between the valleys alpine, the plain area and the Turin hills, among which there is still an important direct connection today albeit fragmented. The connection wires more significant are, evidently, the watercourses that directly link the three areas, making them not alone communicating but also intersecting” (PIVCT, 2020, p.10, research translation).

Taking into account the morphological evolution of the urban body, in respect to the recognition and organization of green infrastructures, the city of Torino proposed a series of plans hoping to regenerate and reorganize the green and blue elements with a new relationship with the built environment. **This turning point is strictly related to the decline of the environmental condition generated by the industrial boom, which had an undefeatable economic interest over the natural urban structures. However, the critical condition of the post – industrial city, Torino started to redirect a great amount of efforts in order to reconnect the green and gray networks with two main strategic plans, *“Torino Città d’Acque”* and *“l’Anello Verde”***. “The debate on the redevelopment of the river banks of the Turin rivers and of marginal and degraded areas began in the 1970s: that was the goal to create an organic system between the various city parks” (PIVCT, 2020, p. 8, research translation). The first proposals were summarized in a document, Piano Regolatore Comunale of 1980: this is the “Preliminary report of Studies on the Green System”. In this report, two urban green subsystems were identified: the “Sistema Verde Azzurro” (late *“Torino Città d’Acque”*) and “l’Anello Verde”, a strategic project for the enhancement of the public parks of the hills of Turin” (PIVCT, 2020, p.14, research translation).

With these first initiatives the city started a new process of redevelopment that revolves around the industrial heritage and footprint of the industrial landscape, however proposing a new vision of the relationship with nature. This shift is particularly evident the plan “Corona Verde” which came a couple of years after the initial proposals. In 1995 the municipality based the new plan, *“Corona Verde”* in the recognition of the value of natural elements and their character in the city.

Green infrastructure - City of Torino

Borgaro
Torinese

Venaria
reale

Turin

Lesna

Beinasco

Nichellino

Moncalieri

Green areas Tidal nature Water bodies

Being *“Corona Verde”* a element for the research, in which not only the municipality implies the initial objectification of green, but It also recognizes the necessity to change to drift apart from the simple vision of nature as an object and give it a new characterization. “The proposed vision of nature abandons that approach to nature as an object of protection and enhances the aesthetic, cultural, identity and symbolic dimensions of green. In this vision, the terms nature, environment, territory and landscape, become part of a same phenomenon” (Corona Verde, I Quaderni di Torino Strategica, 2016, research translation).

This new connotation of nature, takes the research back to the findings on the theoretical approximation in the chapter of *The Categories of Greening*, in which the city wants to drift apart from the simple categorization of nature an object and explore the possibilities in between. This is a valuable shift in the green notion of the city, being the first step towards a new transition in the administration of urban green in Torino. This policy worked as a preamble for the introduction of the future ones, such as the current “*Green Infrastructure Strategic Plan” (Piano Strategico dell’Infrastruttura Verde, PSIV)* approved in March 2021.

The “*Green Infrastructure Strategic Plan”*, introduced a more detailed analysis of the natural infrastructures in the city. Particularly the plan highlighted the historical, symbolical and environmental value of the green typologies present in the urban fabric. Moreover, the plan took a step forward and incorporated new strategies to counteract against climate change and achieve a sustainable relationship with grey infrastructures. The characterization of nature in the emerging policies, took such a shift from the objectification in the industrial of the industrial era, that the attribution of value would even seem coin it as an urban subject. Nevertheless, the recognition of its value is only given proportionally to its capacity to be in a functional relationship with the city. In other words, the introduction of green elements as generator of ecosystem services, aesthetic enhancers or mitigation mechanism against climate change, are still deeply rooted in the objectification of nature. In the case of Torino, it is also true that the rivers and emerging urban ecosystems around them have a character of their own. The new spontaneous green that starts to re-colonize the industrial footprint, reveals that nature in fact, can and will prevail even after it has been countlessly objectified. As Lucilla Barchetta reflects upon the importance spontaneous green. “Places such as Stura Park show how necessary for greater recognition of spontaneous green is communication activity, information and education about the renaturalization processes taking place in the city, confronting the difficulties encountered in building forms of urban ecological citizenship in which we go beyond the traditional reference to a framework of specialists and experts” (Barchetta, 2021, pg. 100, research translation).

Under this light, the connotation of *Nature* and *Greening* in Torino stands in a blurry line, at the most nature could start to be recognized as a subjected subject, given that the research agrees with the fact that the subjetification of nature cannot be completely dismissed, in some cases. ***However, the city’s vision still gravitates towards the definition of green and nature as a source, which will be better illustrated in the following chapters with the examination of the policies and future projects of the city.*** With this preamble the investigation proceeds to revise the administrative dimension and management of green governance for Torino, taking a look at the record on it green regulations and present policies, already introduced in this chapter.

3.4. A Broaden Look to Governance and Urban policies

Corona Verde

The end of an Era: Decline of the Fordist Model

"Corona Verde" is a key plan in terms of green infrastructure for the city of Torino, it dates back to the to the beginning of the restructuring of the city, where the post-industrial landscape plays a massive role in the environmental conception of green. As it has been discussed on previews parts of the research, the industrial heritage of Torino has taken a toll on the processes of regeneration and reconnection with the natural elements in the urban and metropolitan area. However, this was a crucial point in the timeline of the policies and regulations that prescribe the condition and development of the modern day urban green infrastructure, especially for a city like Torino. In the XX century Torino was known as the one-company town, ruled by FIAT, which also defined the city expansion and development at the time. However, as the city enters the decade of the 80´s, it experiences a shift in its economic and social base, hopping to tackle many of the problems left by the industrial era and wishing to keep up with the international panorama in terms of development for the future. Nevertheless, facing the post-industrial landscape is no easy task, where "the quality urban and open spaces is an explicit objective, a challenge for the "car city", still burdened by areas abandoned industrial buildings and suburbs in need of redevelopment" (Cassatella, 2016, p. 69, research translation).

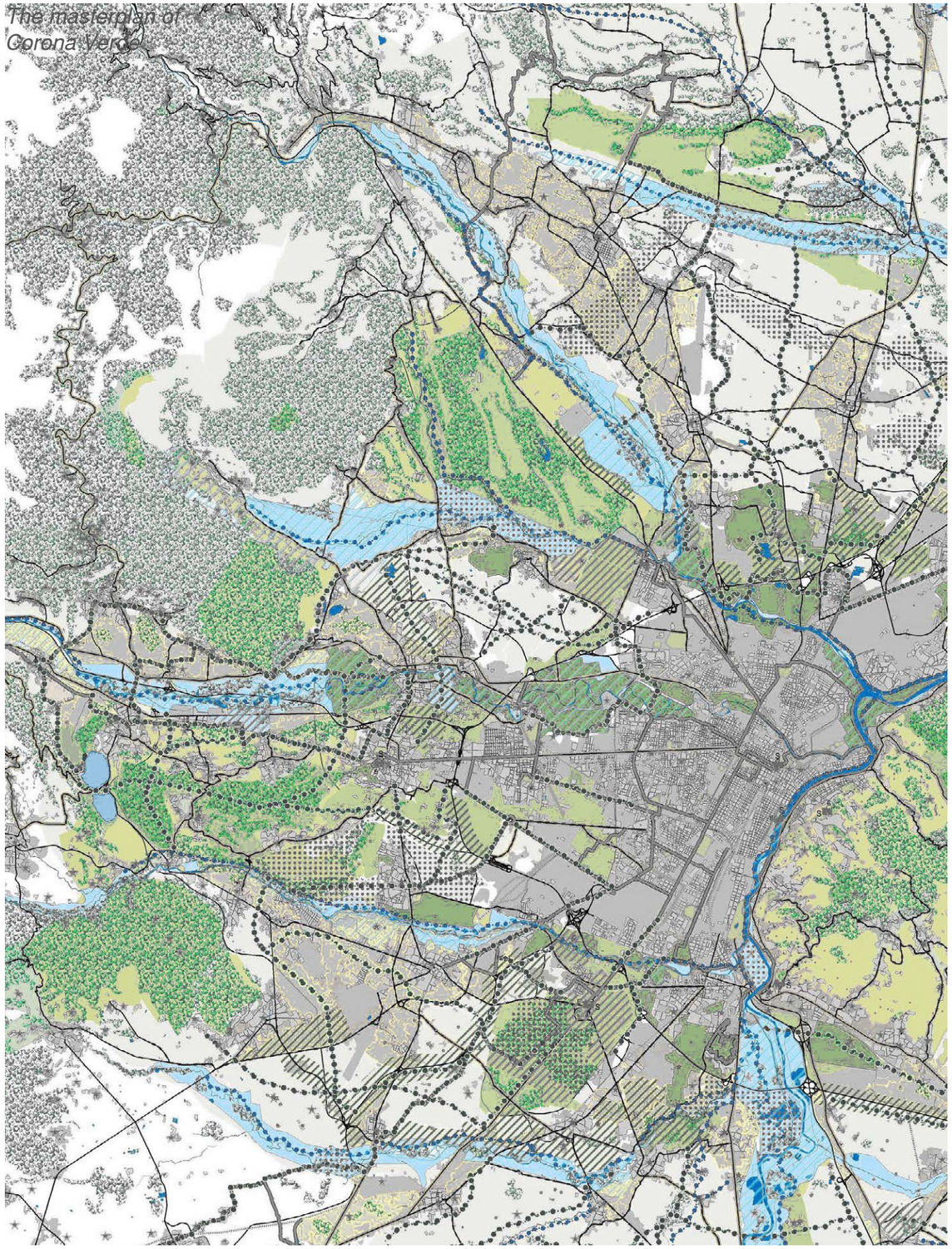
At the beginning of the 90s, and in addition to the urban, social, political and economic challenges, the city of Torino faced a serious decay in its environmental dimension, forcing the city to rethink the role and management of its natural assets in its development. As Cassatella, hightlights in her article *"Pianificazione ambientale e paesaggistica nell'area metropolitana di Torino - Nascita e sviluppo di un'infrastruttura verde 1995-2015".* "In the early nineties the area was in decline, full of industrial voids, polluted, with few spaces fragmented and underused publics. Equipped though some key resources: the structure of the tree-lined avenues (approx. 250 km of trees, according to Sector estimates del Verde), the historic gardens, some large parks not far away, the rivers, the landscape scenery given by the Alpine crown and the hilly backdrop, equipped with lookout points and panoramic routes. The long tradition is also a resource in the management of urban greenery and a deep-rooted environmental culture" (Cassatella, 2016, p. 70, research translation).

With this background, the city started to work on a series of initiatives and regulations that directly tackled the environmental condition of the city. The starting point was the *"Piano regolatore della Città di Torino"*, from which many other policies later came along. Among them *"Torino Città d'Acque"* (1993) and later on *"Corona Verde"* , approved in 1998. The new vision behind this plan, proposed the connection among the natural green and historical green elements that composed the urban and metropolitan areas. "In 1998 the park authorities, together with the Bici& Dintorni FIAB Torino association, proposed to create a system of greenways to connect the Sites to each other e with the protected areas, so as to mix the users of cultural and naturalistic destinations. With the slogan "Art and Nature" the idea of "Corona Verde" was born" (Ibid., 72, research translation).

"Corona Verde" is a project with a predominant territorial character. Focusing on the metropolitan area of Torino. It was conceived at end of the 90´s with the aim of intervening significantly on the problems of degradation and consumption of soil, including the main green typologies that compose the city. Among these typologies the plan considers the historical green (Corona di Delizie), better known as the system of royal residences in combination with the green belt of urban parks, rivers, bicycle and pedestrian paths, and rural peripheral green areas. Furthermore, *"Corona Verde"* is a territory itself, defined by the administrative limits of several divisions established by the municipality. The action area of the plan is currently composed of 93 municipalities which are the reference point for the projection of the metropolitan and regional scales. In terms of its timeline, the project has its beginning in 1998, being constantly updated along the year with new actors, actions, ideas and even a technical territorial masterplan added in 2010.

Overall the plan proposes a systemic approach to the urban and metropolitan green infrastructures where, for the first time, the city talked about a possible transversal relationship between the economic factor and the natural assets. *"Corona Verde"* also describes some lines of action in order to create a productive green infrastructure, working on areas such as metropolitan agriculture, ecosystem services and green as a touristic attractor. As the plan itself reflects on the strategic approach:

"The strategic value of the plan bets on the knowledge that the Green Heritage is not an element that frames the territory, but a fundamental component for development, capable of generating services for the health of the citizens; for food production; to better the quality of the territory and the built area, also increasing the land value; for tourism and leisure time; to increase the hydrological safety; to guarantee the citizens a better life quality" (Corona Verve, Quaderno Verde, 2016, research translation).



The masterplan of Corona Verde

"The result is an interconnected system of greenways, blueways, parks urban planning, fruition equipment and cultural heritage, which provides at the metropolitan level a multiplicity of ecosystem services: protection of natural systems (waters, habitats and networks), enhancement of identity local and historical heritage, possibility for activities outdoors, sporting, tourist and educational". (Cassatella, 2016)
Illustrated by the authors

According to the previous statement, the Master Plan *“Corona Verde”* is divided into four strategies which are graphically described in technical plans corresponding to the new, environmental, economic and territorial directions:

1. Counteract against the urban sprawl and redefine urban edges and entrances:
2. Build the ecological network, defragment and strengthen habitats.
3. Promote the multifunctional potential of rural areas
4. Enhance local and territorial identities promoting fruition and tourism.

Another one of the main points of the plan is the direct relationship with the mobility infrastructure for the expansion and internal connection of the city. In this sense the historical green pathways and the connection with the historical green assets becomes essential. “For some time now, the green infrastructure and its potential evolution from Corona Verde, together with the Metropolitan Railway service, represent the main project strategy of the territory that today makes up the Metropolitan City of Turin”. (Corona Verve, Quaderno Verde, 2016, research translation)As a one of the main conclusions, the Masterplan *“Corona Verde”* and the local Observatory of the Sustainable City propose this definition of Urban Green Infrastructures: ***“The set of green spaces endowed with plant coverage, natural introduced by man, located within the city and between cities, and their functional relationships”*** (Corona Verve, Quaderno Verde, 2016 research translation).

Green Infrastructure Strategic Plan

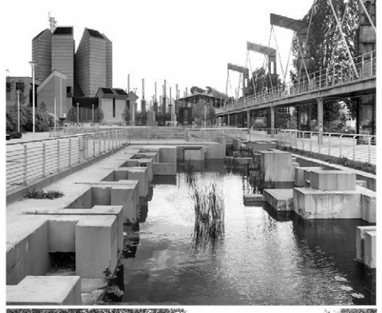
Following the first policies and approaches of the city to restructure its relationship with the natural environment, the City Council Resolution approved the “*Green Infrastructure Strategic Plan” (GISP) (Piano Strategico dell’Infrastruttura Verde, PSIV)* in March 2021. The plan was developed by the Department of the Environment, regarding a strategic project within the *“Torino 2030 Action Plan for a Sustainable and Resilient City”*. **Following up on the post -industrial transition, the general vison of the new plan concentrated on recognizing the value of Green, and most importantly it characterizes it as an urban infrastructure. In this order of things, the document has two main analytical approaches. The first one considers the urban greenprint, in which a qualitative and qualitative analysis of green typologies is carried out. The second one, focuses in a quantitative and economic analysis of the ecosystem services generated by the city’s entire green infrastructure system as a basis for future planning of its functions (PSIV, 2020).**

The recognition of green as an urban infrastructure, gives the natural elements a different connotation around the future development of the city, as it allows it to contribute to the social, economic, political and technological development. This new perspective of urban green, has an opposite connotation to the one given by the city in the industrial era, proposing to integrate the natural elements to all the dimensions of the future city of Torino. As described by Schiaffonati (2016) in the article *Il territorio delle infrastrutture*. “If, at a terminological level and within an economic sphere, it denotes works that do not directly take part in the productive process, characterized by a network organization and clearly distinguished from ‘punctual’ equipment, the notion of infrastructure is currently referred to multiple categories of public works that contribute to the socio-economic development of the country, by equating the term infrastructure to that of social overhead capital” (Schiaffonati, 2016, p. 12, research translation).

For a city like Torino, with such a strong industrial and productive heritage, this conception of green becomes essential in order to archive the so called, “sustainable city”. It is only by understanding and recognizing the existing character of the urban fabric, that it will be possible to incorporate the green infrastructure in the post-industrial landscape. In this sense, the new plan for green infrastructure gives a different perspective of green elements, in which they are able to enter a productive role in the context of the reindustrialization.

Productive Green

Hill Parks
Hill Forests



River Parks
Productive Green

Touristic Green

Greenways

Historical Gar-
dens and Parks

Recreational Green

Urban Parks

In order to take at closer look at the new conception of the plan, it is pertinent to go over the general structure of the document. The first chapters give a detailed characterization of the green elements, starting with the historical evolution of green in the city and subsequently analyzing the different types of urban green in Torino. The categorization also follows, a recognition of recreational greenery, urban horticulture, ecosystem greenery, cultivated greenery, and green good tourism. Towards the second half of the plan, the discussion turns towards the productive potential of green, regarding urban agriculture, ecological corridors and natural touristic assets. With these last typologies, the city wishes to tackle modern day issues, such as climate change and the effects of the lack of green, by introducing the ideas of ecosystem services and the mitigation capacity.

Regarding the most sensible aspects in the plan, it is noted that one of the limitations of the action range is the type of administration of the green spaces, which are quantified in the total area of the city. As discussed earlier in the research, only 38% of the green areas correspond to public administration and 62% to private. In relation to this aspect, it is inevitable to question the role of private interests in the management of the areas, in opposition to the social impact that this might have in the future, given that the "*Green Infrastructure Strategic Plan"* essentially only directs the course of public areas. Moreover, the territorial analysis proposed the first approach in relation to the social dimension of the city, tackling some aspect of in the distribution, age and economic capacity of the population. Even though, there is a portion of the of the analysis dedicated to this aspect, the plan remains short in terms of an action plan to successfully develop concepts such as greening around social equity and green gentrification.

Overall the strategic plan embraces in great detail the quantitative and qualitative elements that compose the green infrastructure of Torino, focusing on giving value to natural elements through its capacity to benefit the urban body. As the plan itself discusses the meaning of green areas and spaces for the city. "Green spaces have always played a key role in the livability of the city. In fact, a city is all the more livable the more it can reconcile built and nature, the more it can guard the natural assets it possesses. The presence of green spaces, the so-called green infrastructure, in addition to indicating the urbanistic quality of built spaces, is a true indicator of sustainable urban development, both from a social and economic as well as from the environmental one" (PSIV, 2020, p.25).

Metropolitan Strategic Plan

When moving forward into the future vision of the city of Torino, the panorama gets blurry and complex when referring to urban green infrastructure. The most recent developments still base their framework on the last "*Green Infrastructure Strategic Plan"*, mostly working on the already proposed guidelines. Along these lines, the city approaches the emerging urban challenges with a new "*Metropolitan Strategic Plan 2021 – 2023"*, in which, the municipality aims for the concept of the Augmented City in opposition to the diminished post -industrial one. The concept of *Augmented City* recognizes the industrial heritage of the city, working with the technological and post-industrial potential to redefine the productive relationships for the future development. As the plan itself explains the meaning of augmented in terms of the urban body. "Augmentation is determined by an adjusted interpretation of the concept of rebalancing, understood not as uniformity but as enhancing the differences and specificities of each metropolitan area. Augmentation is the transition to a post-Fordist, post-pandemic metropolis that harmoniously combines natural and man-made environments, developing the potential of both to build equity, well-being and sustainability" (MSP, 2021, p. 114, research translation).

In other words, the report recognizes all the modern-day urban challenges in relation to the accumulative historical condition of the city, and seeks a rebalance of the relationships among the different infrastructures that compose it. The plan is divided into 6 axes, which correspond to the 6 programmatic points of the Next Generation Europe program and the 6 missions of the National Recovery and Resilience Plan. The axes are in turn divided into 24 strategies and 111 concrete and timely actions. Even though, each one of the axis has a different emphasis, the general guidelines that characterize the plan, include the technological innovation as a base for the analysis. Considering greening as the main topic of the research, the future analysis of the policy will mostly concentrate on the strategy that is directed to greening.

More specifically, **the plan dedicates its second axis to the *Green revolution and ecological transition (Asse 2 - Rivoluzione verde e transizione ecologica)*,** in which the main objective is to: To increase the ecological, environmental and landscape quality of the metropolitan area by reducing its ecological footprint, redefining its metabolic processes in a circular form, and thus contributing through local actions to the global challenge posed by climate change (MSP, 2021, p. 158, research translation).

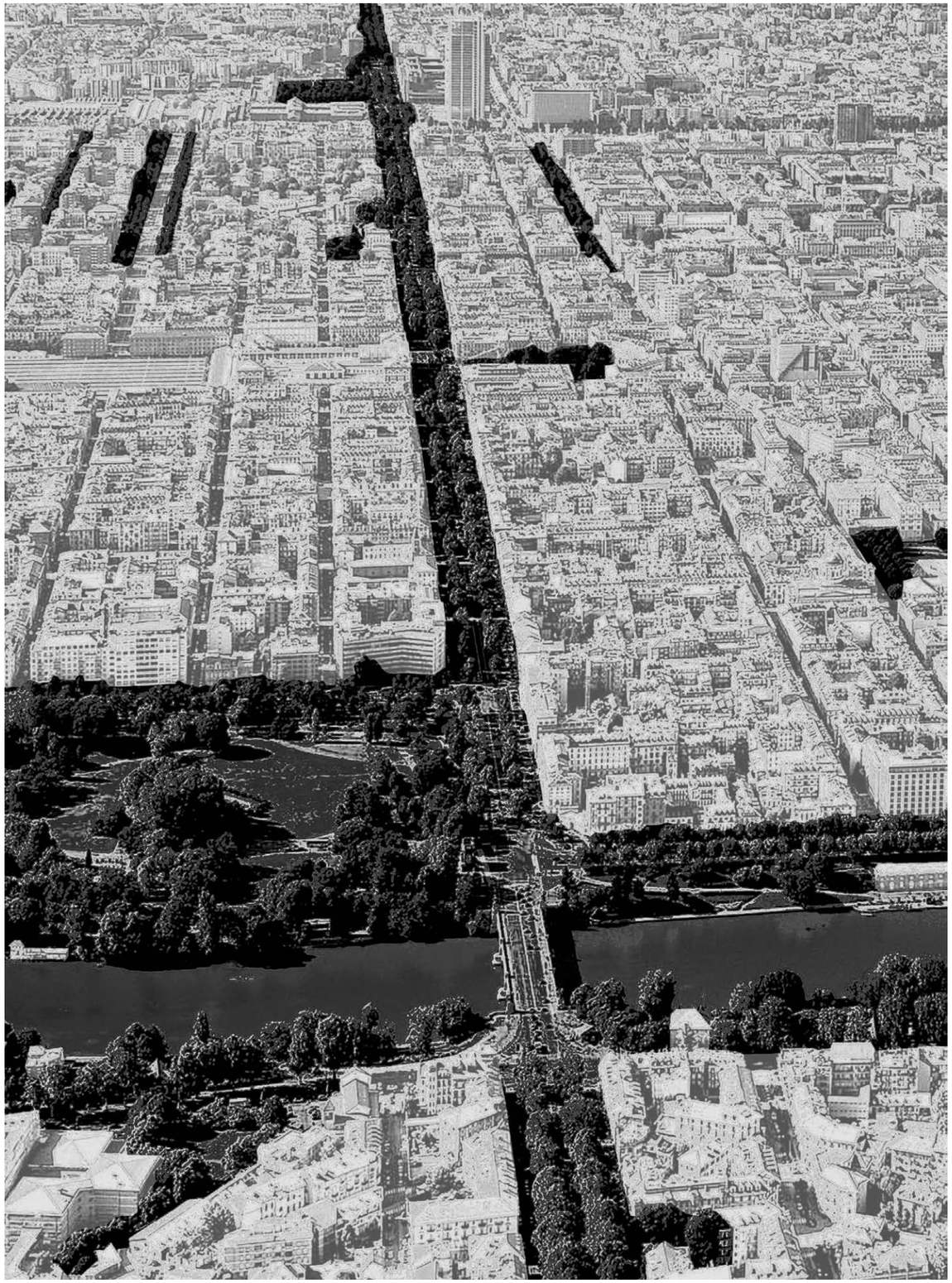
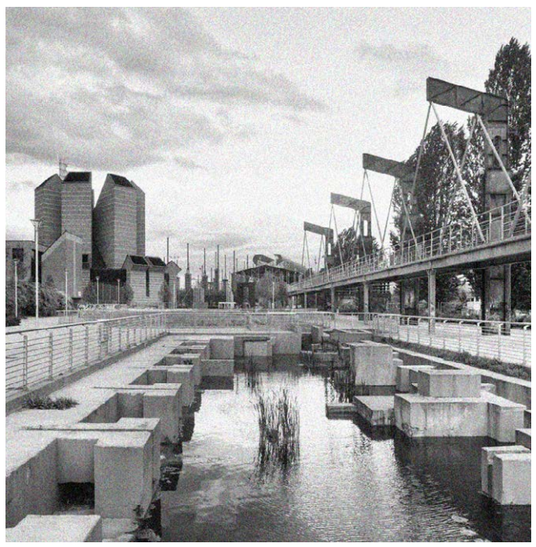


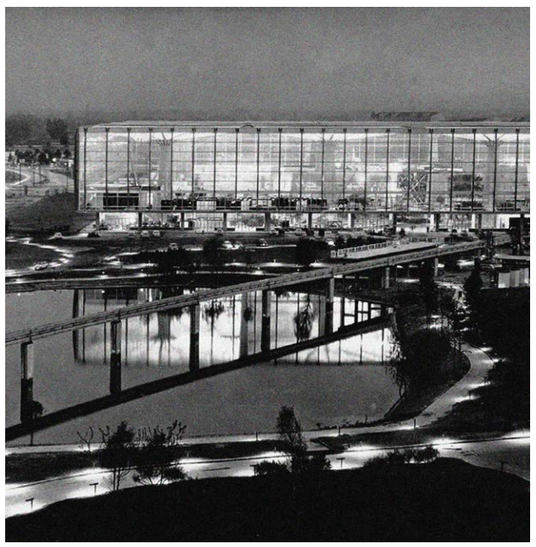
Image 18. City of Torino - Image Retrieved from Piano Strategico Metropolitano 2021-2023

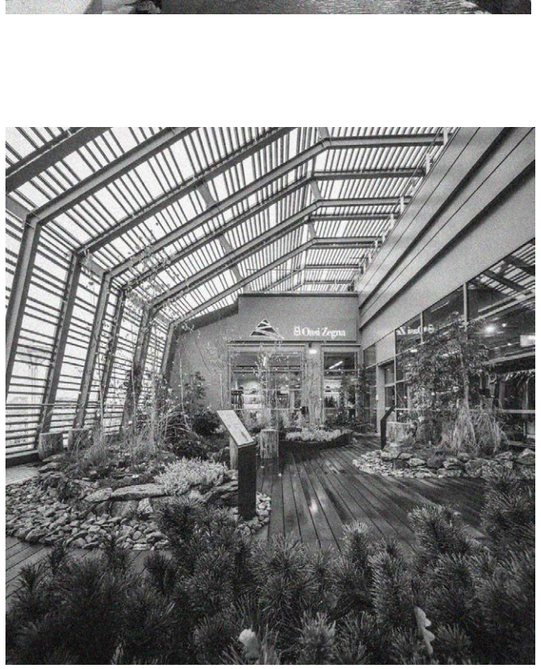
In a general view the strategy proposes a more productive and innovative city, in which the virtual and physical infrastructures work together to achieve a green and sustainable city. For this reason, the role of green infrastructure plays a decisive role in real sustainable development of the urban area, being one of the two most pressing axis in the policy along with *Axis 1 Digitalization, innovation*, competitiveness and culture. The policy focuses on five strategies regarding the *Green Revolution:*

1. Building and infrastructure of the green metropolis.
2. Promoting the smart reuse of brownfield sites and existing assets.
3. Enhancing renewable energy opportunities for metropolitan areas.
4. Becoming a metropolis of Green Building.
5. Becoming a circular metropolis.

When taking a closer look at the policy in relation to the so called, the *Green Revolution* and ecological transition, it is inevitable to notice an emphasis on the implementation of policies tackling the industrial and productive potential of the city, however being mostly the only one. The greening strategies run short in terms of analysis in relation to social justice and the distribution and access to effective green in the social dimension. Even though the social aspect is considered in other points of the report, it would be crucial to find the balance and relation among the urban population and the natural elements.







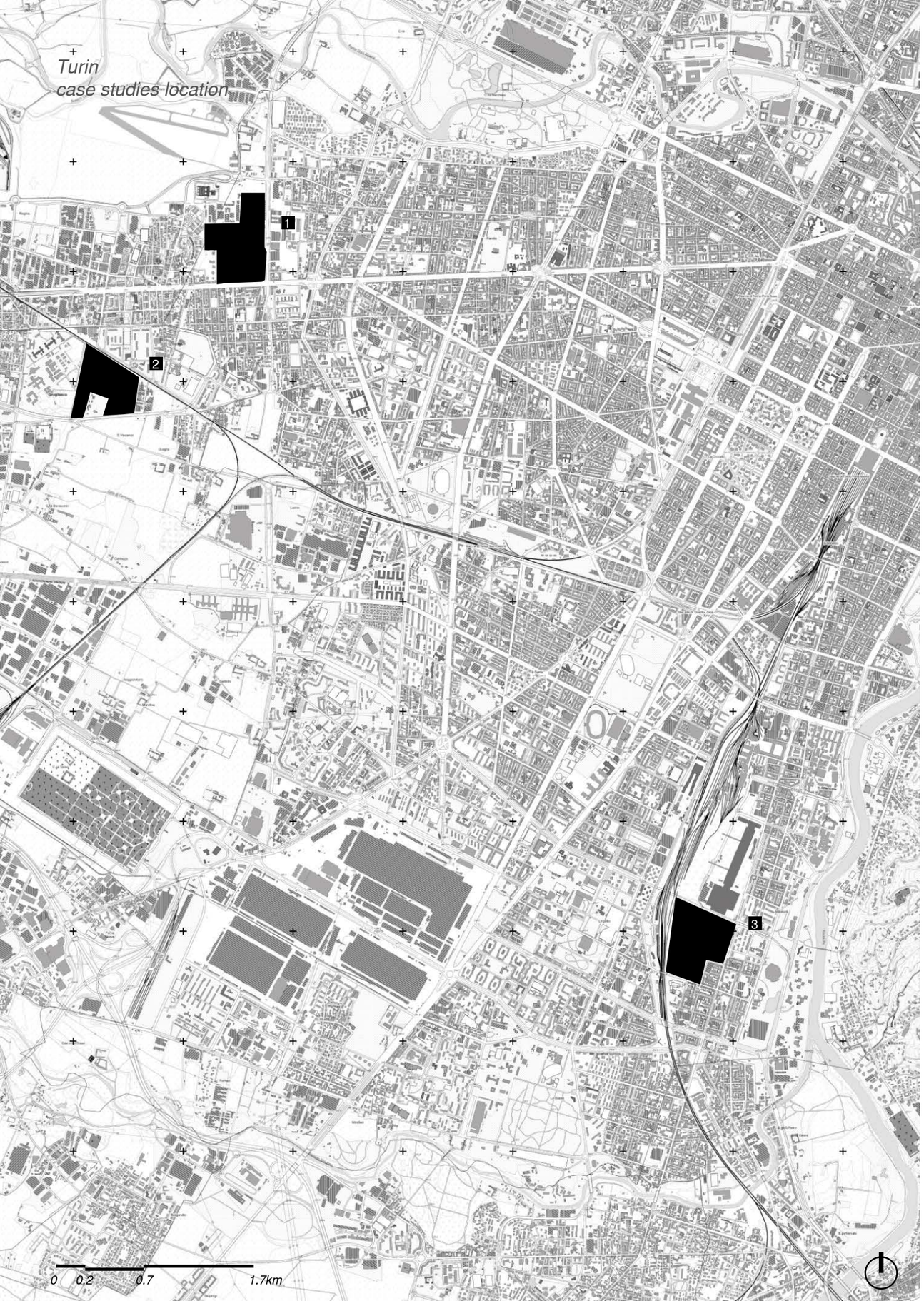
Future strategies for the city of Torino

3.5.
Urban Case Studies
Torino

After settling on a clear picture of the present administrative management and governance around green infrastructures in the city of Torino, the thesis dedicates the next portion of the study to take a look at its implementation on future urban projects. This approach is based on the fact that, even though, policies and reports from the municipality have a general saying on the future of green elements, the urban landscape is, in many cases, shaped by specific urban projects that don't necessarily have a public interest as a priority. In the case of the city of Torino the selection of the projects was carried out by understanding that large scale projects, are currently beginning developed based on functional and mobility infrastructures.

Within this framework plans such as Spina Centrale [15], which, even if they are not the focus of this exploration, play a leading role in the transformation of the city's landscape and new green areas, following future mobility lines on top of anything. Moreover, an emerging functional Spina to the west of the city, is the new base line for educational and productive projects, which align with the technological revolution the city is aiming for. Under this criteria, the next chapter will be dedicated to the analysis of a three future projects designed for the city of Torino and their coherence and dialogue with the policies around urban greening.

15. "The Central Spina is the artery that runs for 12 kilometers crossing the city from north to south, the result of the gradual covering of the railway line. According to what was defined by the 1995 General Regulatory Plan prepared by Vittorio Gregotti and Augusto Cagnardi, the construction of the Railway and the concomitant reconnecting two parts of the city long separated by a wide urban boulevard turns out to be one of the main drivers of the city's real estate, economic and social development. The Spina in fact sequences four large disused industrial areas facing the railroad track, named Spina 1, 2, 3 and 4 proceeding from south to north: The PRG envisages their complete reorganization and re-functionalization to make them new urban centralities" (MuseoTorino,Comune di Torino,Direzione Musei,Assessorato alla Cultura e al 150° dell'Unità d'Italia, research translation).



1. *Corso Marche and Città dell`Aerospazio*
2. *Città della Scienza e dellAmbiente*
3. *Parco della Salute, della Ricerca e dell`Innovazione*

a. Corso Marche and Città dell`Aerospazio

Città dell'aerospazio is a future urban project inscribed within a bigger framework of renovation of abandoned industrial areas of the city. The approach goes along the lines of the so called "Spina Centrale", a series of interventions that tackle several urban issues, which emerged from the postindustrial landscape. As explained by Bonomo (2008) in his article "*La Scommessa Torinese Di Corso Marche":* "La Spina" presents itself today as the main element of quality urban area, the point focal point of an urban rebalancing unprecedented that, even with a series of real estate derivatives (of size, location and characteristics different from the original idea), allows the return to the city of over 2 million square meters of abandoned industrial sites" (Bonomo, 2008, p. 72, research translation).

In this fashion, the project of Città dell'aerospazio is no exception, being part of a larger idea for a second Spina located towards the west, that will tackle abandoned industrial sites, parks, residential areas and mobility systems. Corso Marche, plays a crucial role in both the creation of this second "Spina" and the definition of the area for the new Città dell'aerospazio.

With this background the research focuses on the project as strategic for the city in terms of location, character and governance. Specifically hoping to bring some light to the greening process and sustainable character of the intervention.

As the area in between Corso Marche and Corso Francia takes a leading role in the urban technological and industrial revolution, the city essentially proposes Città dell'aerospazio as a new neighborhood that serves as an Aerospace District, wishing to promote the city as an Aerospace Hub in a national and international level.

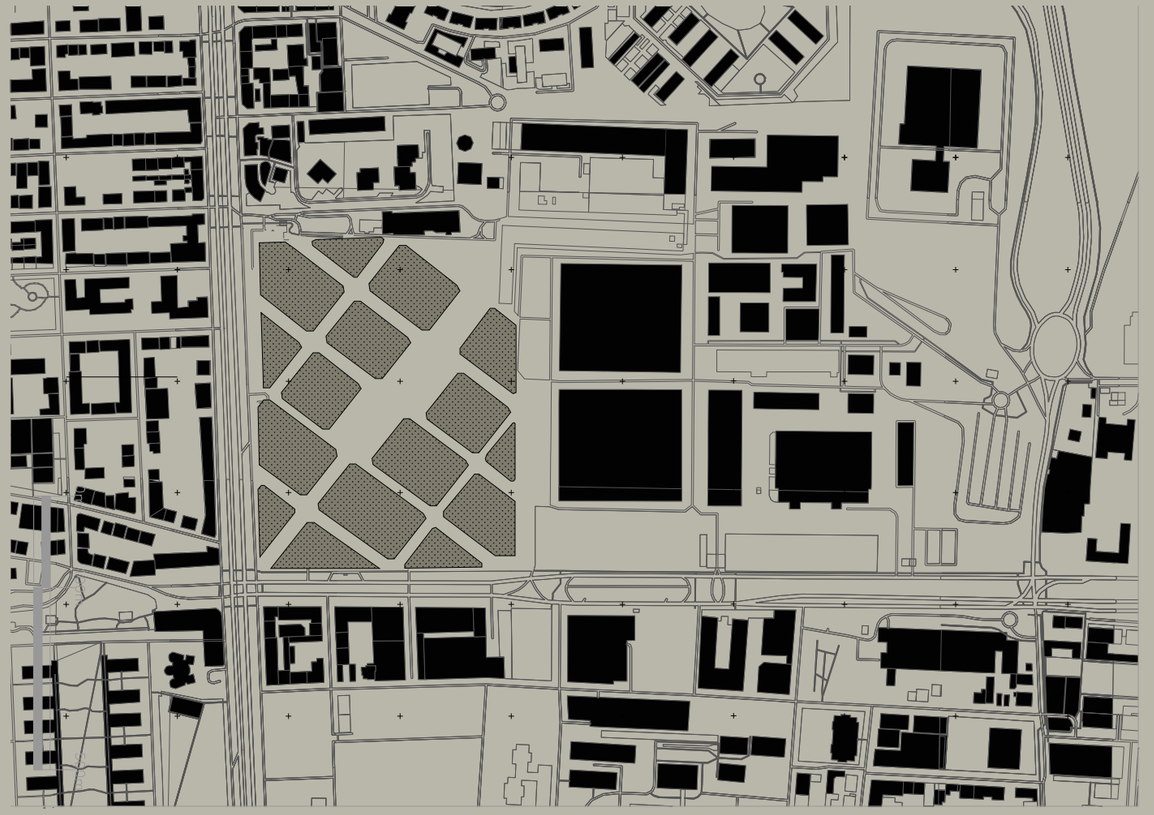
The new area essentially wants to create a space that unites, the development of the Aerospace Company, Academy and Training areas, for the development of SME (small medium enterprises) and new Start Up incubators. In addition, the production of areas of public interest, a museum, but most importantly a strong urban regeneration, with new residential spaces, sports facilities and public green.

The intervention is composed of two main parts, the first regards the Aerospace District, a research and development center of 25,000 square meters, designed for approximately 1,000 employees and intended to house companies involved in aerospace production. The second intervention concerns the creation of a district in which green elements and public space integrate to the different functions and building typologies.

The project will be developed by a group of stakeholders, among which some of the most important are: The Piedmont Region, Thales Alenia Space, the Municipality of Torino and the Politecnico di Torino, with the collaboration with Leonardo SpA.

Regarding the green character and elements of the project, it is only possible to know the vision to a certain level, considering that the execution phase is planned to start in 2023. Moreover, as obvious as the sustainable aspect of the project might be, the actual public plans and documents limit the design of the green infrastructure of the project to a huge park that will surround the residential, academic and sports areas of the intervention. The operation concentrates in the technological and productive urban relationships, however, leaving aside layers such as the green public infrastructure to a second degree of priority.

Related Entities: *Distretto Aerospaziale piemonte*
Urban redevelopment area: *3.500m²*
Stimated year of construction: *November 2023*
Architectural program: *Education, Laboratories, greenaries*



b. Città della Scienza e dellAmbiente

Taking into account the new focus of development of the city to the west, with a second *"Spina"*, which will host a series of projects targeting the future vision of the post-industrial city, it is fitting to discuss the project of Città della Scienza e dell'Ambiente to the research. Moreover, this operation goes along the lines of the new objectives proposed by the municipality, in the search of targeting the academic and technological potential of the city, in order redirect the economic relationships, originally based in the industrial character of the city.

The official project dates back to 2019 when the *Università degli Studi di Torino* launched a European contest for the leasing of a public work through a public-private partnership, wishing to achieve a definitive executive design and financing to furnish and maintain it for the next 20 years. The complex will mainly be a new university center, dedicated to scientific research, high-level training and the environment, which is also one of the targets of the latest "*Metropolitan Strategic Plan"*. The project is developed by a strong group of stakeholders including the Municipality of Grugliasco, the Piedmont Region, the Municipality of Torino, the Università degli Studi di Torino and Intesa San Paolo, as the main financial promoter.

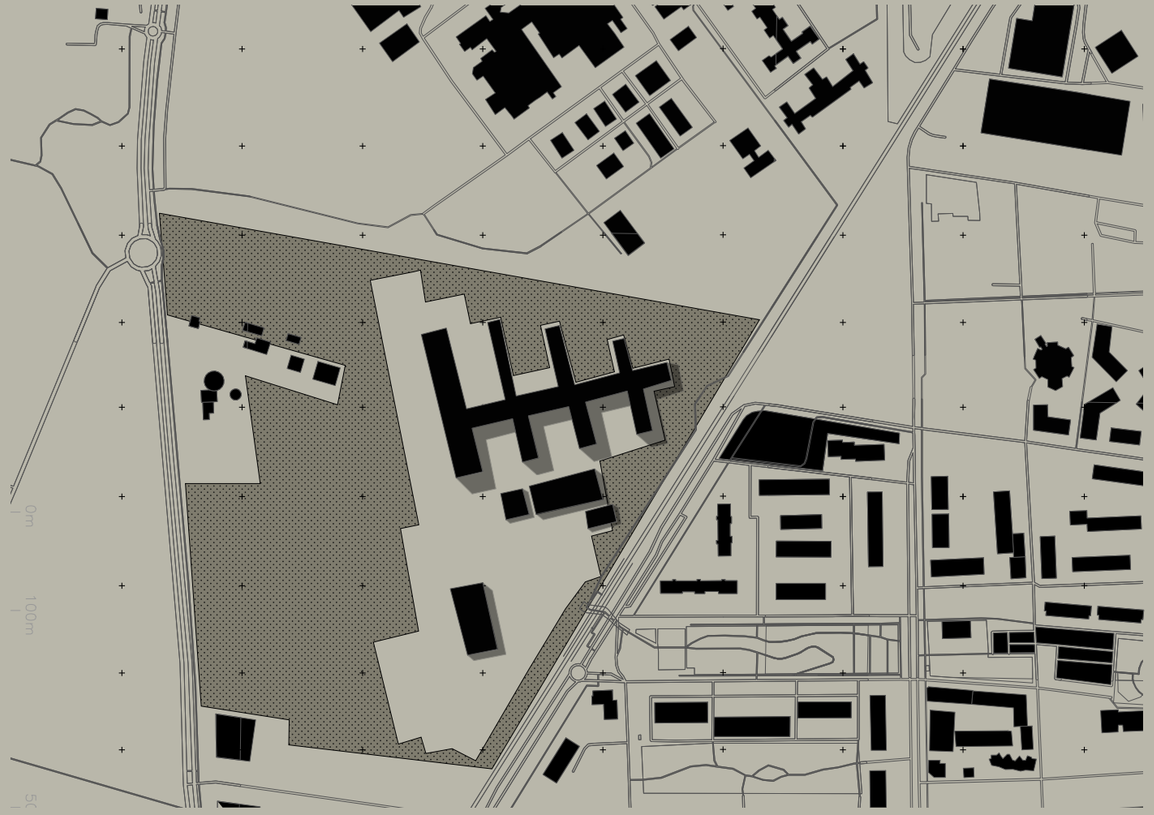
The intervention, will spread over a total area of 250,000 m2, with the construction of various buildings of multiple uses, a Building for Education and Research, one dedicated to Education and Administration, a Sports Center and a Technology, all inserted in ***a park with public areas and footbridges to connect the various buildings.***

This is one of the most interesting aspects of the whole intervention, taking in account that instead of being a redevelopment of an existing abandoned industrial area (like many in the city of Torino), the construction will be done in an existing green area, area between c.so Torino and c.so Adriatico. In this sense, this project is a unique opportunity for the city to implement a completely new vision of green, which is not subjected to a previous industrial background, but instead it allows countless possibilities in the integration of green infrastructures.

One of the main challenges of this development is achieving the balance between the green and gray infrastructures, that at the same time should be successfully connected to the city context in order to follow the lines of the existing policies. ***For this reason, the buildings described will be surrounded by Urban Park, with a total footprint of almost 52,000 square meters, in which the main aim will be to connect all the buildings, host various cycle and pedestrian paths, areas dedicated to outdoor fitness, and more importantly a 2,100 square meter botanical garden for educational purposes but also for relaxation areas surrounded by greenery. In addition to the park, a special network of internal roads, cycle paths and circular squares, suitably connected, is considered, in order to facilitate the connection of the various educational, administrative and sports areas.***

Moreover, the design of the project wishes to follow the guidelines of the Piedmont Region on climate change and sustainable development, hoping that it will be able to boost the transition of the regional economic system through support for research and innovation for smart, sustainable and inclusive growth.

Related Entities: *Costruzioni Generali Gilardi, Euroimpianti*
Urban redevelopment area: *40.000m²*
Year of construction: *November 2020-2024*
Architectural program: *Start-up labs*



c. Parco della Salute, della Ricerca e dell`Innovazione

Parco della Salute, della Ricerca e dell'Innovazione di Torino, which was initially promoted in 2002 as a new research and health pole in a metropolitan and regional scale. As many of the new architectural and urbanistic projects of the city, this intervention responds to the post-industrial heritage, by placing its development in the former Avio-Oval industrial area. From a physical point of view, this center will replace the primary health infrastructures carried out by the four major hospitals in the city: Regina Margherita, Sant'Anna, Molinette and C.T.O.

The intervention area has been identified as Z.U.T. (Zona Urbana di Trasformazione) 12.32 Parco della Salute, della Ricerca e dell'Innovazione Headquarters, established as a strongly connected area from an infrastructural point of view and with the city center than with the periphery. The general project will be constructed in a total land area of approximately 313,725 m2. The actual design and execution phase have been blurry regarding the spatial representation and materialization of ideas. However, in 2009 through l'Accordo di Programma integrativo, allowed the approval of a new urban variant, through which the surfaces and states of properties were rearranged, along with permitted uses in the area. The update of this document allowed to define four districts, which take into account the common development policy:

1. District 1: Parco della Salute, della Ricerca e dell'Innovazione
2. District 2: Headquarters of the Piedmont Region and activities of general interest;
3. District 3: Complementary activities to the Project
4. District 4: Oval Fair Area.

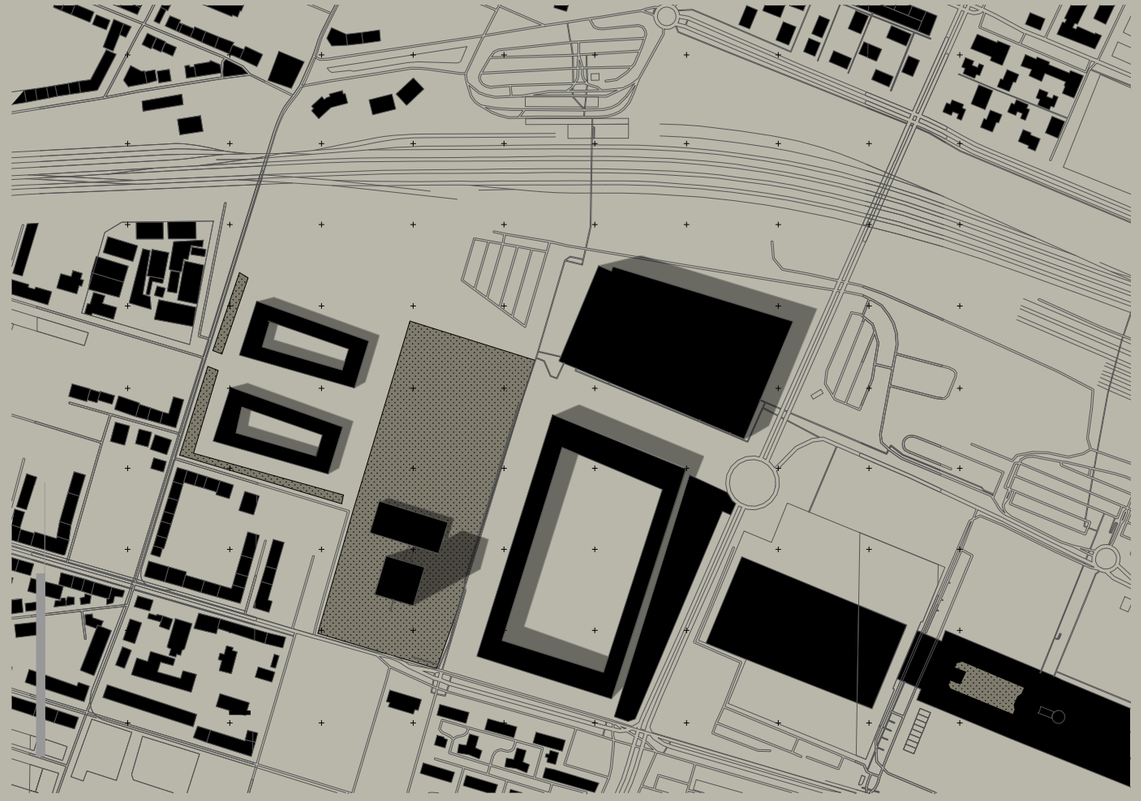
Thanks to this reorganization of the project, it was possible to develop four documents that have the function of establishing the general direction to be taken for the design of the PSRI. This research will center its attention on the first *Notebook On Urban Morphology*, containing the most detail description of the design in terms of public space, green areas and distribution of the green and gray bodies.

The most recent spatial design, presents several issues regarding public space and green elements. The intervention is located in a complex lot, having to create a constant dialogue with the preexisting surroundings that limit the expansion of the project, but that also conditions the functional distribution of the areas. To the west the intervention area limits with the southern railway line and with the Oval, to the east with via Nizza, to the south with the residential and commercial fabric on via Passo Buole, and most importantly to the north with Lingotto Fiere being a critical public/ green area.

In the case of *Parco della Salute, della Ricerca e dell'Innovazione* the design of the green areas, is completely subjected to the complex medical infrastructure layout proposed by the initial plan, leaving little space to rethink the real connection and effectiveness of green bodies. In a specific description, the green areas have been reduced to isolated blocks surrounded by gray infrastructures, without a particular connection.

However, it goes without saying that this project goes along the lines of the actual Strategic Metropolitan Plan of 2021-2021, in which the 6 axis corresponds to the Health dimension, describing its main strategy as "building a system of technologically advanced decentralized health centers connected to the City of Health".

Related Entities: *Regione Piemonte*
Urban redevelopment area: *unknown*
Stimated year of construction: *Not specified*
Architectural program: *Education, Research*



3.6. Considerations
City of Torino

After taking a detailed look at the green governance, policies and their correlation with future projects of the city of Torino, the research proposes a series of considerations in order to bring light to some of the most relevant and critical aspects of the current approach to greening process. In a general overview, the research cannot deny the consistent connection in the main lines of action among the different plans, when it comes to the written policies. Furthermore, their recognition of the historical development, and more specifically, the industrial heritage, seem to play a decisive role in the construction of the relationship with natural bodies. The evolution of green is clearly evidenced in a parallel manner to expansion of the city, always translating the urban vision according to the social agreements and collective constructions of each historical period. In this sense, it is an accumulative outcome of the values and priorities established all throughout the evolution of the urban body.

Moreover, it has been found that the city of Torino understands its green infrastructure as a productive asset, laying its value on the capacity to integrate in a functional manner to the structure of the city. In this regard, "greening" is considered as the mechanism that allows the city to shape and restructure the natural elements, in order to establish a profitable and ongoing urban relationship.

It goes without saying Torino has done a detailed analysis of the green inventory, providing spatial recognition and a well-defined set of typologies that derive from the historical evolution of green bodies. More importantly, this categorization is established by the *"Green Infrastructure Strategic Plan"*, followed by a series of proposals to organize and articulate the green elements in the metropolitan area. However, as specific and detailed as this type of analysis might be, the reports tackle one element at the time, leaving a small space for the understanding of how infrastructures and typologies work together. As it is best described by one of the authors in the book *"Torino 2030 A Prova di Futuro"*, referring to the importance of envisioning the city not only from a close look of its singular parts, but from the complexity of its entire construction:

"In order to build a common basis to be able to discuss of this concept, one must understand the phenomenon of complexity, moreover, to consider the whole recognizing the individual components that contribute to define it – our universe, as physics reminds us quantum, is composed of a complex system of relationships. These reports can be read using the metaphor of the fir tree, furthermore the ability to recognize the difference between a fir - tree leaf in the whole and a fir- tree leaf whose needles have been broken down" (Deregibus, 2021, p. 136). Considering that the existing reports and analysis of the single parts, have been carried out with such detail, it would be a much more interesting approach, if the policies could focus on understanding how to cross and restructure the relationships and complexity generated among them. The creation of landscapes, and in this case, green urban landscapes could incorporate a more complex and inclusive system of relationships. The exchanges among humans but also with the natural non-human world, referencing back to Gandy and Descola, would allow the integration of some of the urban dimensions that have not been yet prioritized.

Public and Private Delimitations

As a consequence, the present approach, the reports might be facing a blind spot when crossing the socio-economical dimension and the development of green elements. Even though the "*Green Infrastructure Strategic Plan" (GISP)*, introduces the spatial analysis of many of the social aspects related to, economic income, accessibility to green spaces, Urban Heat Island risk and new inhabitants in the city, among others, the outcome of the plan for future developments runs short when proposing greening strategies that incorporate these aspects in the project phase. Furthermore, the GISP and the other policies concentrate on the public management of green areas, leaving aside the impact that the disconnection between public and private might have in the city. As the GISP describes, regarding the type of administration of green spaces in the city, 38% is public and 62% is private. Regardless of this proportion, the report it limits its strategies to the public portions of green without going into further detail on how to articulate them with the private portion.

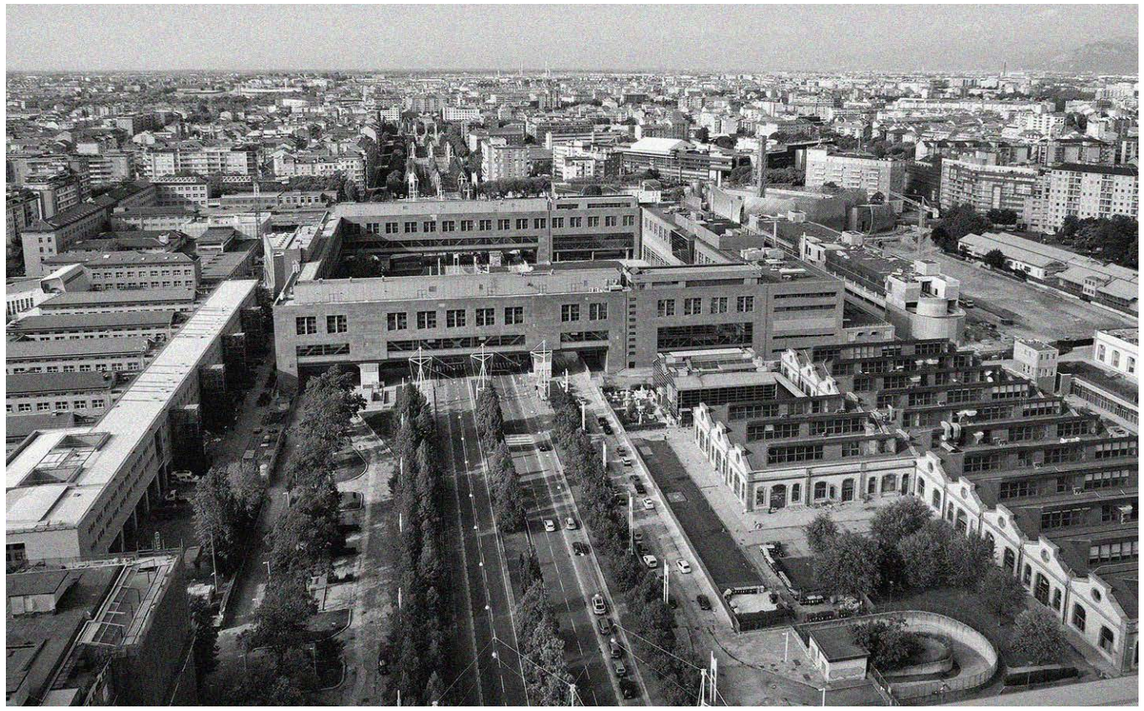


Image 19: University central campus and public area.
Politecnico di Torino. (2023)

Image 20: Examples of NBS designed for Valdocco
Città di Torino. (2020) Politichepiemonte.

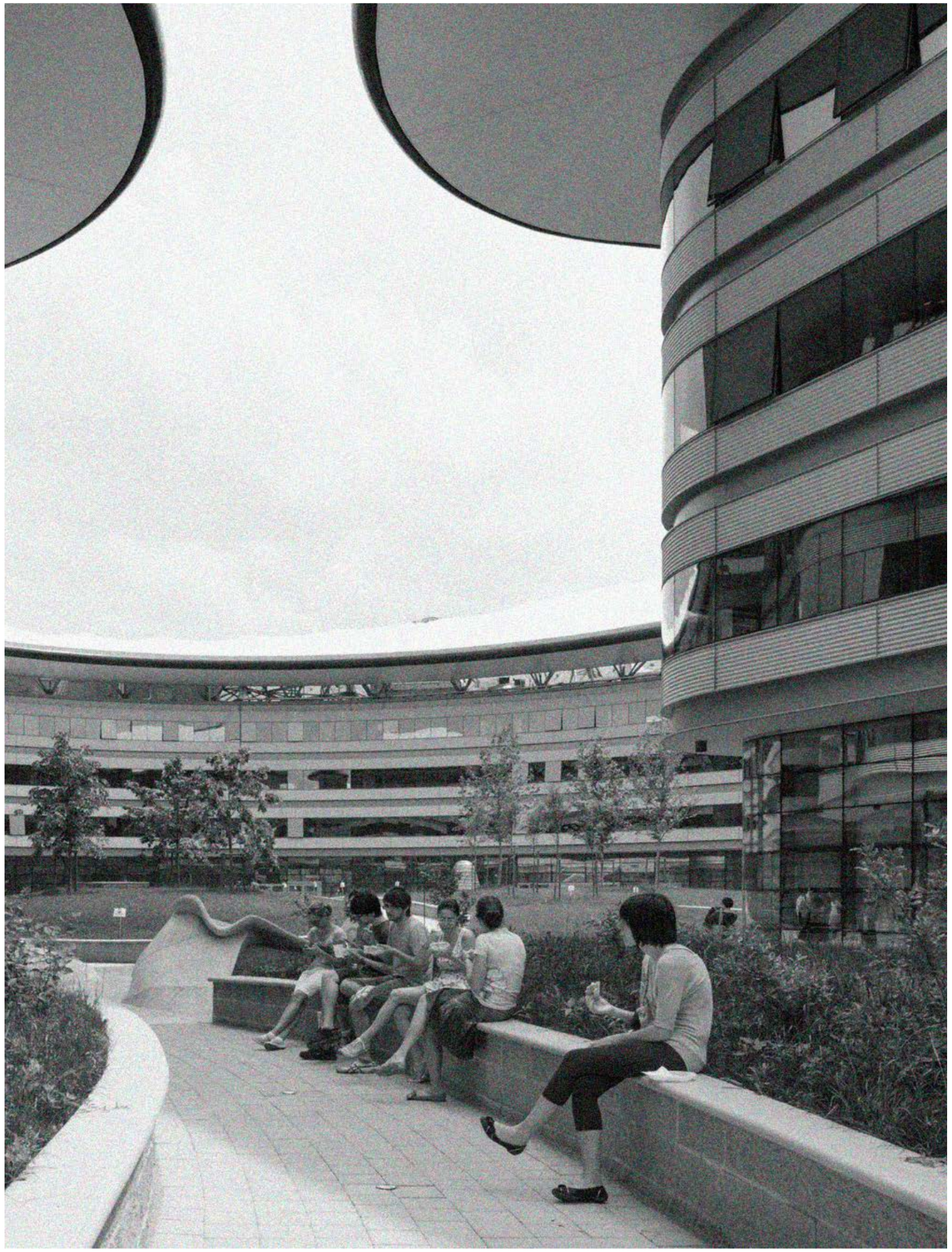


Image 21: Campus Einaudi, University Pole. (2021)

When thinking about the possible effects of this characterization of public green space and furthermore, on its relationship with the socio-economical dimension, the consequences might refer to topics like social inequity and gentrification due to the strong position of private interests over public ones. As Bolzoni and Semi (2023) Discuss in their article "*Adaptive urbanism in ordinary cities: Gentrification and temporalities in Turin" (1993–2021):*

"Aalbers (2019) describes the fifth-wave of gentrification as characterized by platform capitalism and touristification, corporate landlords, highly leveraged housing, transnational wealth elites and a further legitimation by and involvement of the local state in promoting and supporting private investments and transformations in line with gentrification processes. While transnational capital and the transnational elite are mostly absent from Turin, the on-going changes appear to fit well into such a frame, especially considering the role of the municipality in supporting private investments and the precedence given to short-term urban populations, such as university students and tourists" (Bolzoni, Semi, 2023, p.5).

Along these lines, the authors exemplifie how private interest can overcome public ones when there is not an intrinsic and significant connection among the different urban infrastructures. Clarifying that the issue might not be related to the distribution of the type of administration itself, but to the dialogue and connection among the parts, the research questions how fragmented relationship with the green urban elements might lead to issues such as gentrification or more specifically green gentrification and environmental injustice, previously discussed in the research.

University City and The Production of Green

For better of for worse, the policies and projects previously reviewed, gradually arrive to the same conclusions and agreements in terms of urban infrastructure. For instance, the three main policies selected by the research, *Corona Verde*, the *Green Infrastructure Strategic Plan and the Metropolitan Strategic Plan 2021 – 2013*, recognize the imminent industrial, technical and productive character of the city. However, when taking a look at the influence of these policies in the future projects the agreements around urban green start to fade. For instance, all of the three urban case studies aim for the restructuring of the city's economy around academic and educational infrastructures as a counterproposal to the city's industrial production. Nevertheless, as attractive and sustainable as this new characterization might seem, when taking a look at the plans for the public green areas of the projects, there is a consistent lack of design, functionality and connection with the rest of the green bodies in the city.

Moreover, the article "*Setting Up a University City. Geographies of Exclusion in North Turin highlights the dangers Higher Education (HE) infrastructures for sustainable discourses, in terms of gentrification processes"* discusses this issues around equitable access to new infrastructures. "Recently, research on the role of HE in urban development, inspired by a political economy approach, has widened the scope of the factors that produce forms of socio-spatial exclusions related to the role of universities in the development of cities and neighborhoods. Rather than focusing on the typical social and cultural transformations associated with increased students' concentrations, this perspective shifts the attention towards the complex array of drivers that lead to the production of space for university students, thus including multiple actors not only students in the production of socio-spatial exclusion" (Santangelo, Cenere, Mangione, Servillo, 2023, p. 3).

The vision of Torino as a University City, plays a huge part on the bet for technological and sustainable development. This has become a parallel phenomenon to the greening process, considering that many of the new functional projects have an academic agenda that includes the creation of services and green public space. However, as it is evidenced in the urban case studies previously analyzed, that the academic portion of the projects is just an addition to new residential, commercial and productive uses that are part of a bigger agenda. The same dynamics reflect on the new emerging green areas, which only benefit the specific project as new services for the objective population, rising its real state value and new residential areas. However, leaving the existing ones in the same vulnerable conditions, in terms of accessibility and lack of green. These type of processes refer to one of the emerging problematics of the sustainable city mentioned in the initial chapters, *Green Gentrification*, specifically the case of production of new green elements behind the academic sector.

Climate Resilience and Adaption Strategies

When taking a look at the most recent vision in the MSP 2021 – 2023 the so called "green revolution" is focused on the new industrial initiatives, generation of renewable energy, circular economy and the implementation of new eco-innovative policies in enterprises. However, as promising as this panorama might seem for the development in the coming years, the line of action still proposes to bring value to the natural elements from an economic point of view, proposing a greening strategy that revolves around the profitability of green infrastructures.

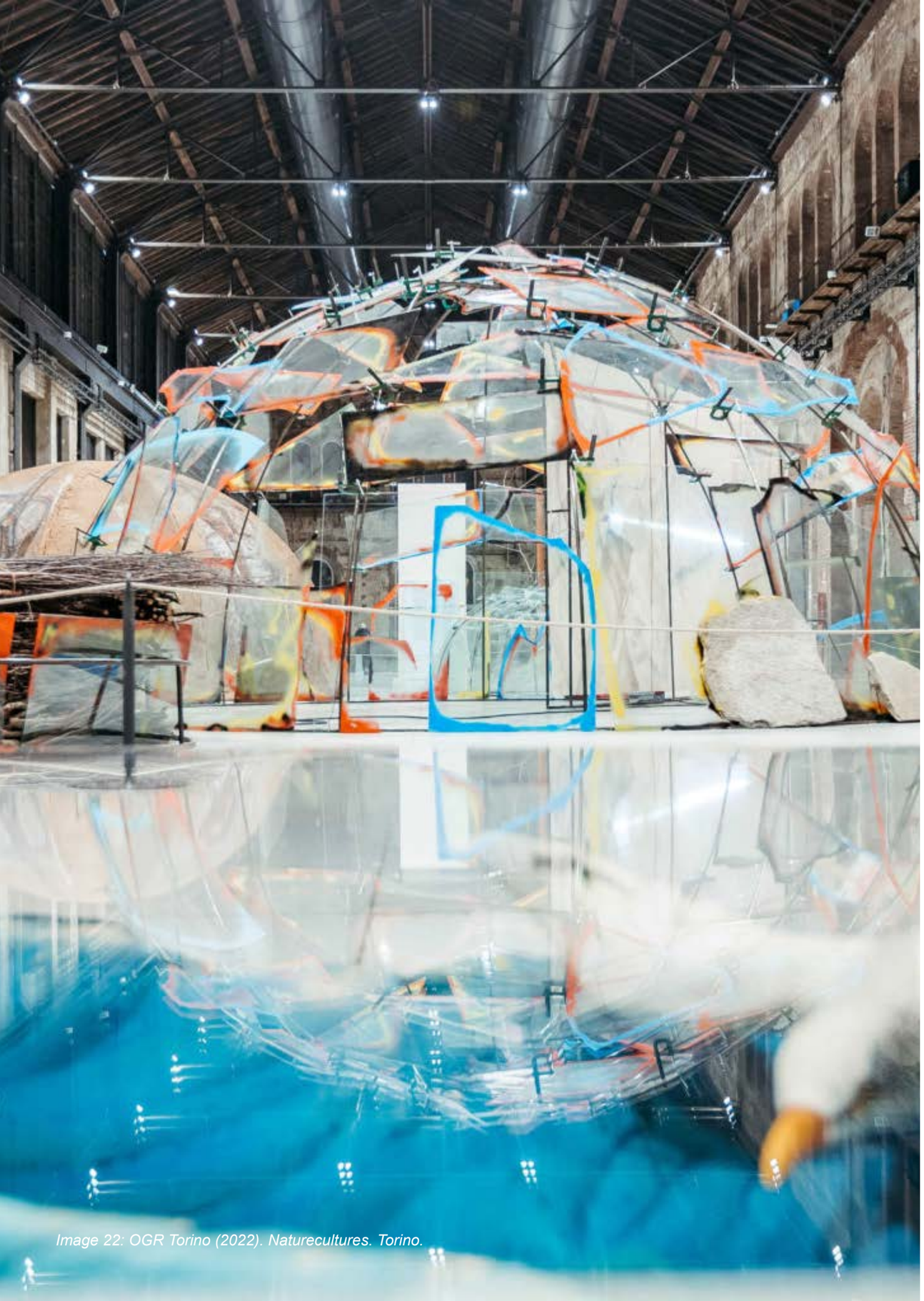


Image 22: OGR Torino (2022). Naturecultures. Torino.

Climate Resilience and Adaption Strategies

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Moreover, the new trends in climate adaptation and mitigation such as Nature Based Solutions, green roofs and walls, and even technological elements such as solar panels have been gradually introduced into the city, under the international framework and the vision of the sustainable city. Nevertheless, these solutions cannot be separated from the pure notion of the objectification of green and hardly connect to the existing natural infrastructures. For this reason, considerations such as the ones from Lucilla Barchetta around the green elements in Torino, become pertinent even when speaking about sustainable implementation. “Traditional management, which today requires an excessively heavy economic commitment, needs to be reconsidered by alternating areas totally regulated by mowing and pruning with areas in which the potential of spontaneous greenery that can be treated with milder and more sustainable methods is utilized. Rather than a simplification of management practices, the initiatives carried out in several French cities, for example, have shown how this type of green maintenance requires a general rethinking of green cultures, as well as of the sociology of work related to urban green, rethinking in particular the role of public gardeners and, generally, the training of workers involved in urban green maintenance (Ernwein 2019)” (Barchetta, P. 97, research translation). Even though, this is a relatively new approach in terms of urban greening for the city of Torino, it could potentially gain relevance not only when discussing the ecosystem services, but also in terms of the connectivity and long terms strategies from mitigation and adaptation to the current climate crisis.

Cap 4.0.
Final Considerations: Is Planning Spontaneity an oxymoron?

Is Planning Spontaneity an oxymoron?

As the thesis approaches the end of the examination of its urban case studies, the explorations on the greening mechanism and the initial theoretical framework, come together allow a final reflection on appearing new urban relationships. Once again, the study defines Greening as: ***"An accumulative mechanism of translation of the perception and relationship between society and urban nature".*** The redefinition of such mechanism unmasks the reality behind the present day notions of greening processes in the city, mostly presenting themselves as a response to the pressing climate crisis and urban functionality. As it follows, the research sits in a position from which, green elements in the emerging "sustainable city", are only the tip of the iceberg. The greening mechanism is in fact based on a deeper exchange between society and nature which can only be revealed from a philosophical, historical and anthropological inquiry of the ongoing negotiations that take place in the urban body. Within this examination, it has been found that the objectification of nature, constitutes the totality of the green constructions in cities such as Rotterdam and Torino, where a single conception of urban nature has been imposed. Moreover, understanding that this imposition of the natural object is not an immediate process, and neither are the environmental issues that derive from it. They are part of a progressive transition of the dichotomy, from the notions of nature as a subject to the object, and everything that could possibly be found in between.

Nevertheless, it is not the intention of this exploration to establish the subjetification as the solution to the urban and environmental issues of the present and future, but as it has been reveled earlier, in the theoretical and philosophical investigation, the thesis cannot completely deny the existence of the connotation of nature as a subject. Moreover, under the perspective of authors such as Descola, or ancient and remote cultures and philosophies, where the recognition of mindedness in nature is conceivable. Going deeper on this idea, when its mindedness is crossed with the temporal dimension, nature presents the capacity to change, grow and evolve on its own without human intervention as Restall (2012) proposed in the previous chapters. **In this sense the recolonization of urban nature in abandoned or former industrial areas may reveal a contemporary notion of the natural subject, and a huge value in the spontaneous nature of the post-industrial landscape.**

However, even if it was impossible to determine how or when the shift of the dichotomy from subject to object occurred, what the study did find, was a complete breaking point in the industrial revolution, clearly experienced in both Rotterdam and Torino. This historical era is identified as the shifting point for urban greening transformations, and most importantly as the catalyzer for the post-industrial landscape, being one of the main challenges in the contemporary urban settlements. As it is also exposed by Gandy (Natura Urbana) and Descola (Beyond Nature and Culture) the industrial revolution marks an irreversible set of effects in terms of urban greening, shaping contemporary projects to tackle the environmental, social and economic voids, which reside from the mass industrial expansion in the urban areas. **It is here when the relationship with nature becomes static, it completely stops oscillating in between the dichotomy, therefore closing the door for a plurality of relationships that could emerge in the urban ecosystem. As a result of a single relationship with nature, profoundly rooted in the notions of the object, a series of symptoms started to emerge in the shape of environmental issues, social and ecological inequity and inevitable degradation processes. Constituting a viscous cycle that is always tackled with the paradox of sustainability as the only mean of redemption in the governance and policies around green.** "By moving from a singular to a plural conception of nature, we become immediately aware of multiple ontological domains and the interweaving of disparate strands of cultural and material change, including the historical antecedents of colonialism, enclosure, and diverse types of extractive frontiers" (Gandy, 2022, p.32). In this sense, **the study comprehends that the concept of nature can only be redefined if the human and non-human realms coexist and interact in a multiplicity of relationships, making space for the recognition of new temporalities and modes of cohabitation**, as Descola and Gandy recurrently propose throughout their work. Within this perspective, the thesis makes a call to challenge the exchanges that take place in the city and try to envision new possible futures where urban nature and greening processes and sustain a more coherent dialogue.

Perhaps, what the evolution of the thesis suggests, is to rethink the planned vision of the city, from a relational point of view, separating from the traditional and current values of urban planning and aiming from more spontaneous and instinctive way of greening the cites: in a way, a *"planned spontaneity"*. Such a "relational planning", as we figure out, is somehow the opposite of Modernity. Since Contemporary Architecture and Planning principles are based on "solving" the problems of Industrialization (Benevolo, 1971), all modernity tried to conceptualize planning as the capability of separating, functionalizing, making the urban condition more efficient, healthier, saner, by intending buildings "as a kind of medical instrument for protecting and enhancing the body and psyche" (Colomina, 2019). Modern architecture distinguishes, separates, protects (Gandy, 2019).

Within such a framework, greening could only be intended as a mechanism, as we explored. This is why the proposal of a relational form of planning, whose main principles are based on allowing, justifying and promoting spontaneous non-human life could somehow be intended as the modernity upside-down. In this sense, a “planned spontaneity” is an oxymoron, since, from one hand, the very concept of planning is defining how a certain process should develop. And, from the other hand, spontaneity defines instead an unknown eco-systemic process where the relations between actors are not known, not predictable, not designable. In a way, “planning spontaneity” could mean “anti-planning” or, as many authors discussed since the 60s, “non-planning”.

The thesis refers directly to the concept non-planning [16], as a possible antithesis to the prescribed sustainable development, containing an established set of goals, strategies and delimitations that inhibits the possibilities for anything else. With a counter proposal for traditional urbanism, the ideas behind this exploration, allow a passage for new delimitations around planning. Furthermore, the approach implicitly suggests a sensible recognition of the temporal dimension, where the creation of the city is given, as multiple exchanges and temporalities reveal themselves in the urban body, and not thanks to a set of planed operations dictated by developers. Under this perspective, the denotation of a single dominant narrative around green elements, brings back the social chronicle used by the green orthodoxy and sustainable developers to emulate a discourse based on traditional urbanism. As it has been portrayed for both Rotterdam and Torino, the creation of green infrastructures is intrinsic to the historical expansion of the urban area. It is precisely here, where the exploration arrives to the conclusion that the whole conception of planning and sustainable development might be involved in a paradox, which contemporary cities cannot seem to scape. The fixed notions of urban beauty and aesthetics, have overshadowed the natural and spontaneous relationships that keep the city alive. It may be possible that the *Planned Spontaneity* approach might suggest an otherwise to contemporary planning.

16. The idea of “non-planning” as part of the very discussion around the theories of planning was firstly explored by the Cedric Price, Paul Barker, Reyner Banham, and Peter Hall in 1969, with the article Non-Plan: an experiment in freedom, published by the magazine New Society. What the article suggests is the homogeneous character of planning, based upon the fact that “most planning is aristocratic or oligarchic in method, even today, reveling in this its historical origins”. (Price, Barker, Banham, Hall, 1969, p.10)

Nevertheless, the idea of producing urban green from the perspective of *planned spontaneity*, has to be approached in a subtle and careful way. For this reason, the thesis has set the confines to the concept of Non-Planning within the contemporary context. This delimitation, goes hand to hand with the article, suggests that is not, in any case dismissing or disregarding the existing notions of planning. In other words, it is not replacing planning with *Spontaneity*. It is not evoking the principle of the *tabula rasa*. It is not destroying, but setting new limits on the existing development processes. “Any advocate of Non-Plan is sure to be misrepresented; we had better repeat what we mean. Simply to demand an end to planning, all planning, would be sentimentalism; it would deny the very basis of economic life in the second half of the 20th century”. (Price, Barker, Banham, Hall, 1969, p. 20) It is not realistic to overwrite entire plots or projects where there is already a preconceived vision, this is not the exercise the thesis is aiming for. But perhaps, it is conceivable to imagine metabolic process within the existing regulatory and urbanistic framework, by reassessing the frontiers of traditional planning to some extent, just enough to allow spontaneous exchanges to succeed. It could be a start to conceive a new way of envisioning future and sustainable planning with different types of delimitations.

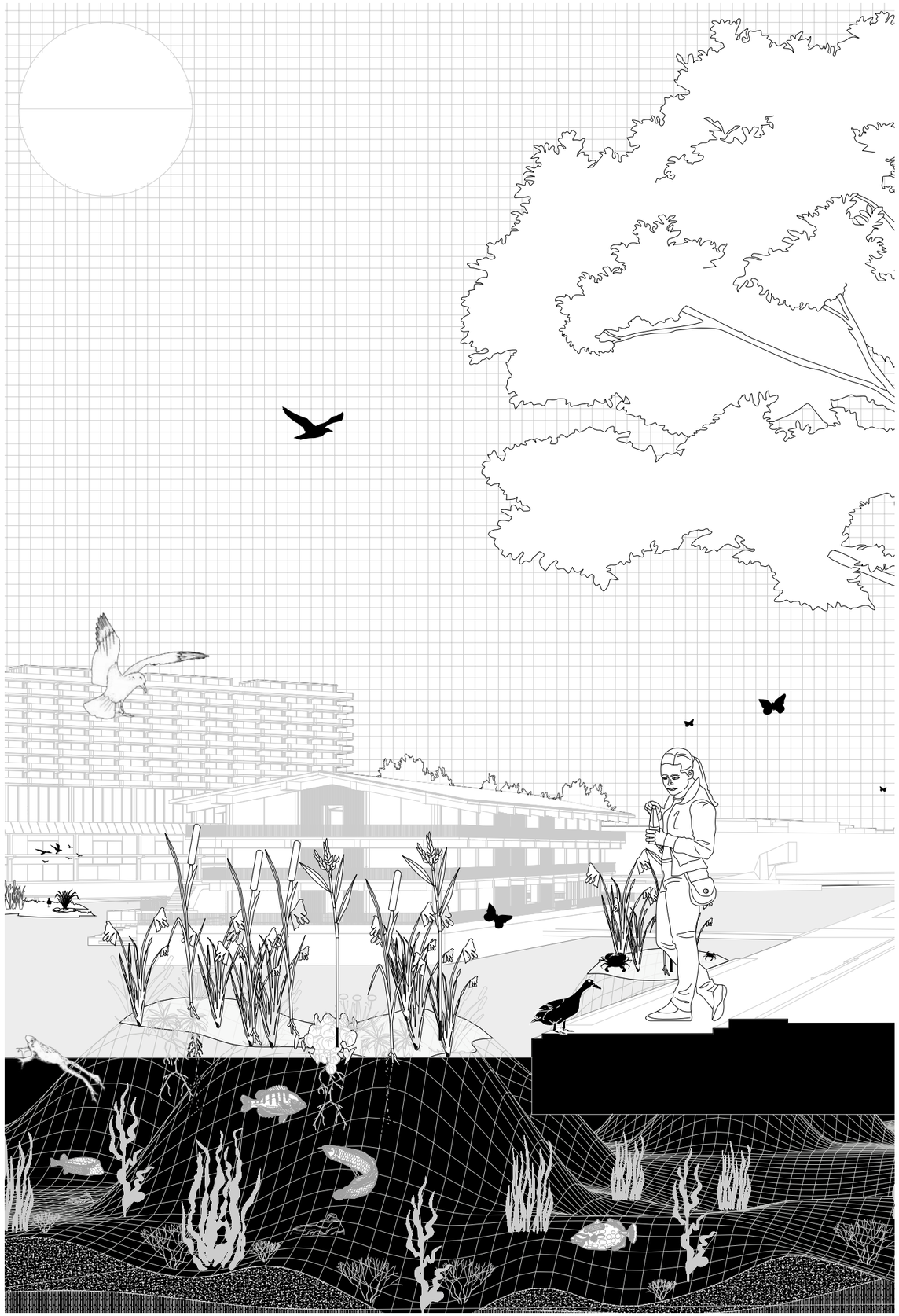
Escaping the paradox of sustainability agenda and conventional planning only by rethinking greening processes through spontaneity would probably not be enough, however it is a step toward inclusivity and balance in urban in terms of urban dialogues. In this order of thing what the thesis proposes as it final exercise, is to **challenge the current ways of greening the cities, through an experiment of planned spontaneity applied** in both Rotterdam and Torino. Hoping to redirect the course of the connotation of nature and greening from a static object towards the “in between” of the dichotomy. Understanding that there is a universe of possibilities within the concept of spontaneity in the urban body, this thesis limits itself to work with the types of relationships that have emerged thought out the course of the exploration.

The exercise will incorporate, the analysis of the cases studies, their policies and projects, the main authors and the theoretical framework that has been studied since the beginning, hoping to redefine greening processes in three dimensions. The first dimension to be reassessed, is a new type of relationship between humans and non-humans, where the integration of different species will ultimately constitute new urban ecosystems. The second dimension, corresponds to the new relationship between urban green and the social/historical heritage of the city, hoping to find new practices of greening that emerge from communal initiatives throughout the history of the city. The third dimension, regards a new type of relationship within the current climate crisis, reassessing the vision for adaptation and mitigation strategies in terms of spontaneous urban nature.

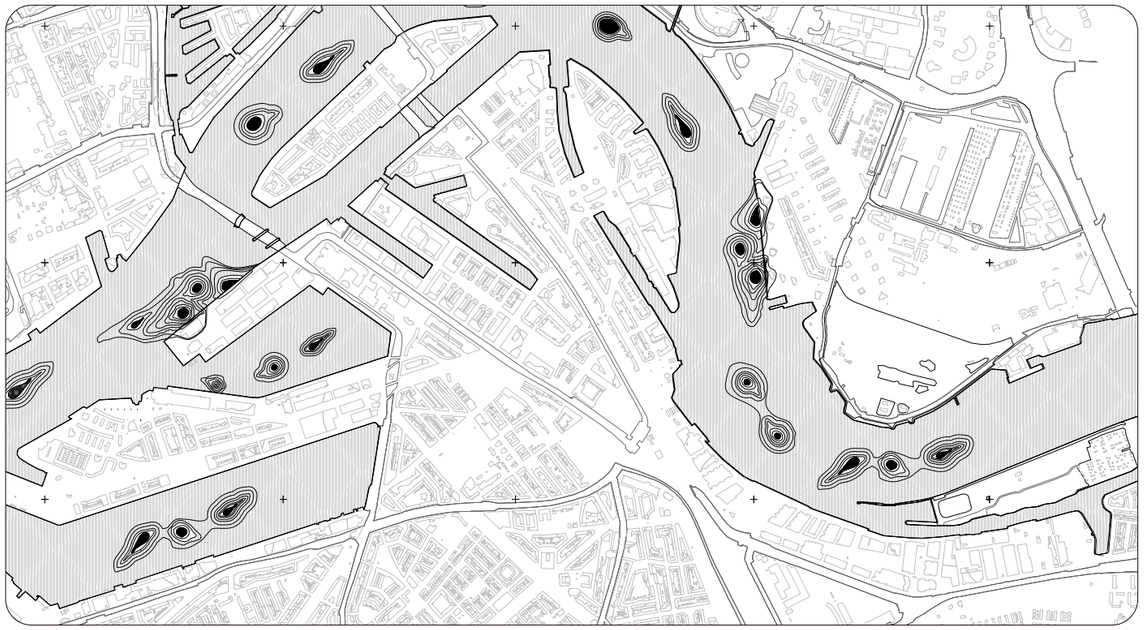
New relationships between the human and non-human world

In the search for new types of urban relationships it is crucial to seek new exchanges with spontaneous urban nature. In other words, the creation of assemblages between the human and non-human world, as it was previously discussed around the theoretical framework. However, in order to establish a connection between nature and culture as Gandy and Barchetta in The Botanical City suggest, it is necessary to reestablish a connection with spontaneous nature. Within this category, synanthropic species play a critical role by becoming part of the actual urban ecosystem. Their characteristic resilience to the post-industrial landscape has proven that there are natural relationships that take place beyond human intervention. Nevertheless, their recognition and living space in the city has been limited to the periphery and abandoned green areas, pushing them as far away as possible from humans. In this sense, a new type of relationship is proposed, by linking the human realm to the non-human one recognizing the countless possibilities of new urban biodiversity. As Gandy explains in his book Natura Urbana, “Part of the explanation for high levels of urban biodiversity is the sheer range of potential habitats that cities can offer, including their own distinctive types of socioecological assemblages found almost nowhere else. Urban wastelands, for example, and many other marginal sites are now widely recognized as ecological refugia or islands of biodiversity. It has long been recognized that so-called brownfield sites and other abandoned spaces can host a huge variety of interesting plants, birds, reptiles, and especially invertebrates”. (Gandy, 2022, p. 7)

Since the applicability of the exercise bases its hypothesis on the case studies, the first set of imaginaries are based on Rotterdam: in The Rijnhaven, and in Torino in the project: La Città dell´Aerospazio. In Rotterdam the research turns its focus towards the study of artificial land as one of its primary expansion and greening strategies, however, in this particular approximation, the artificial land is used to generate a new type of hybrid ecosystem. The connection between aquatic and terrestrial biodiversity becomes part of the greening agenda for the project, reimagining the inevitable production of artificial land in the port area, with a more sensible approach. For Torino, the approximation to new greening process evokes the practice of walking in the emerging urban nature in the river areas, as both Gandy and Barchetta discussed in their work regarding Torino, in The Botanical City. “In this essay I argue that “walking with plants” in marginal urban areas can offer a means to build a collaborative laboratory of environmental change, in that it represents a transformative practice of engaging with the elusiveness that characterizes the processes of ruination in urban settlements that cause places to experience neglect or destruction”. (Gandy, Jasper and Barchetta, 2020, p.170) Particularly the recognition of projects that restructure former industrial areas, are an opportunity to reimagine the connection with wild urban nature by walking among it. In other words, synanthropic species that have slowly grown over the post-industrial footprint and have started to claim a place in the green structure of the city.

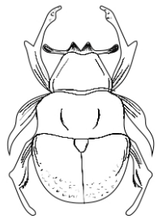


New relationship between humans and non-humans/ Rotterdam Rijnhaven

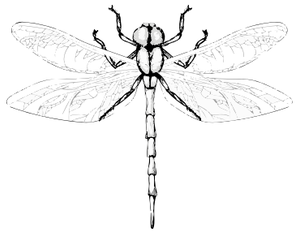


Urban Green

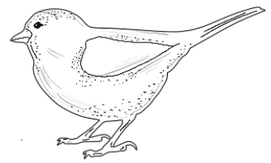
Common Hedgehog
Erinaceinae



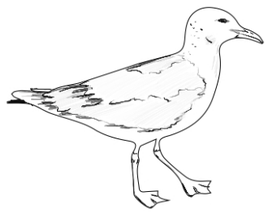
Pine Chafer
Polyphylla fullo



Norfolk Hawker
Aeshna isoceles



European Robin
Erithacus rubecula



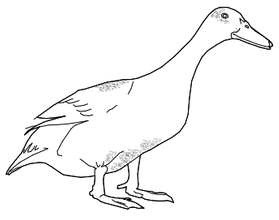
Yellow-legged Gull
Larus michahellis

Pea Crab
Pinnotheres pisum

European Common Frog
Rana temporaria

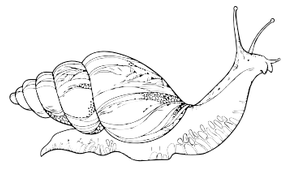
Speckled Wood
Pararge aegeria

Brown Trout
Salmo trutta

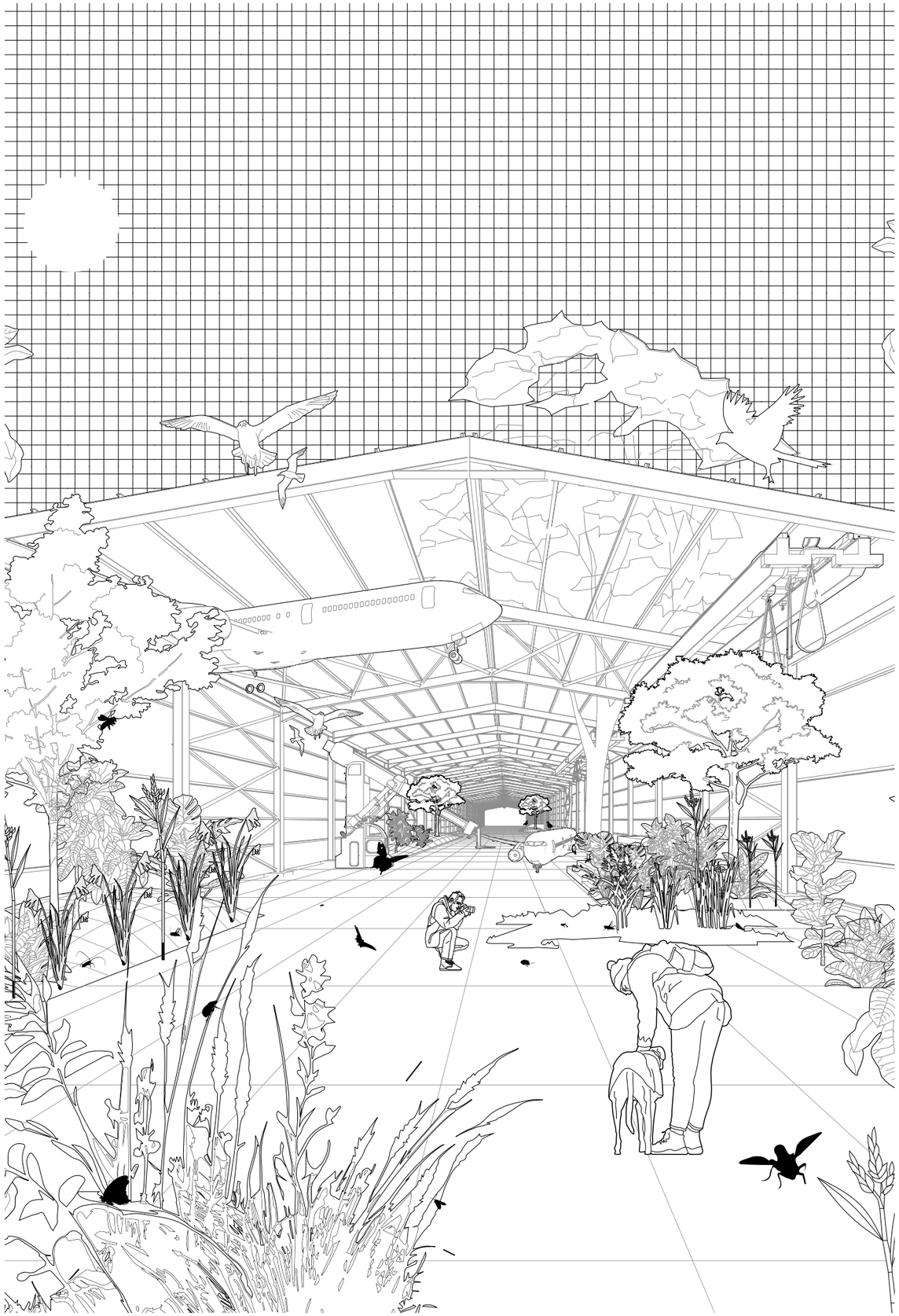


Mallard
Anas platyrhynchos

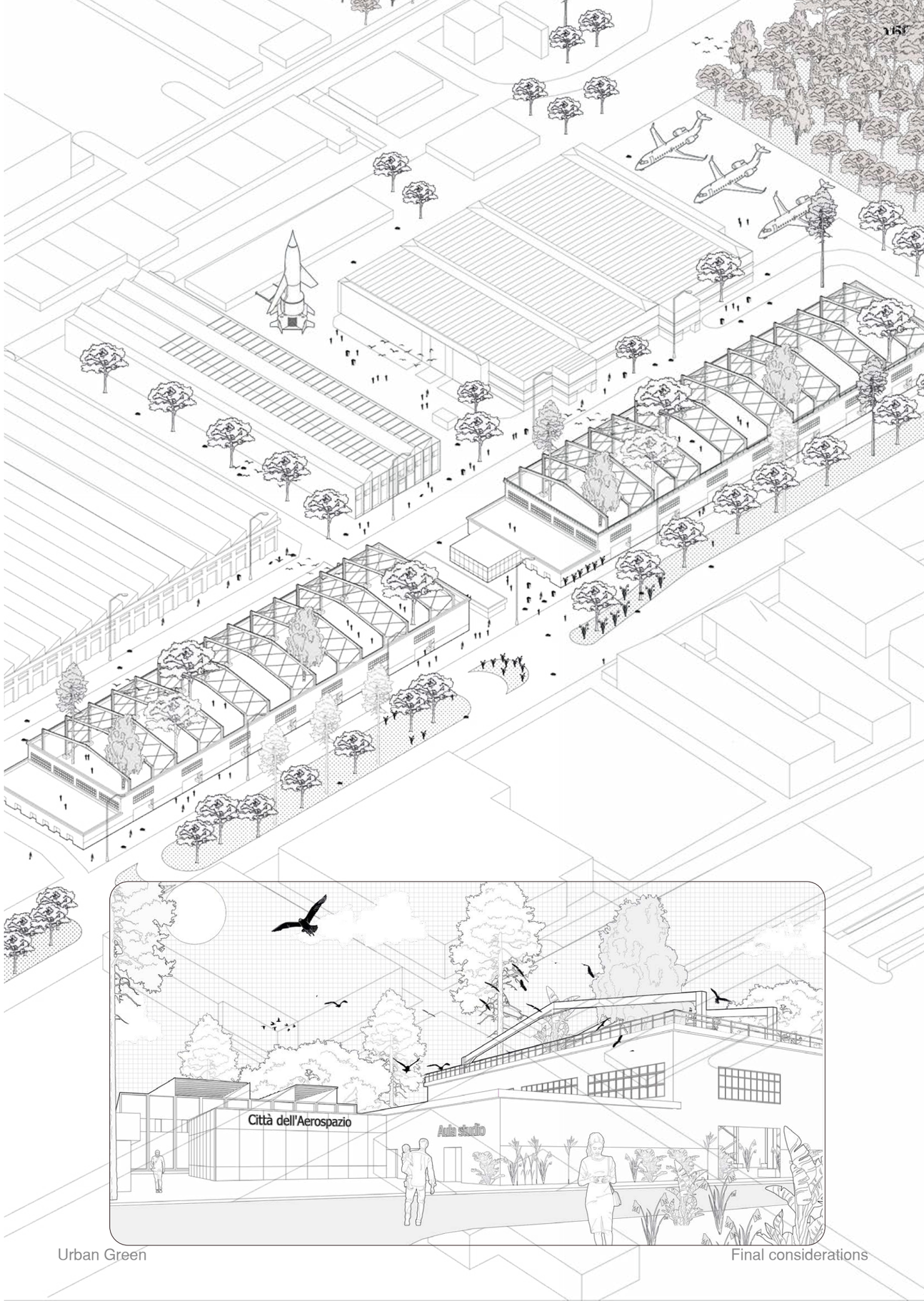
Smooth Newt *Lissotriton vulgaris*



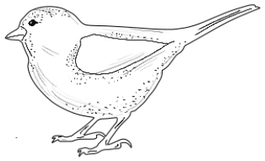
Brown-lipped Snail
Cepaea nemoralis



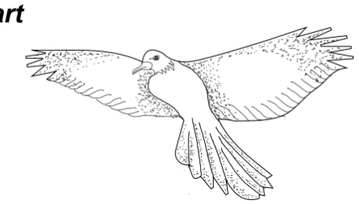
New relationship between humans and non-humans/ Torino, Città dell`Aerospazio



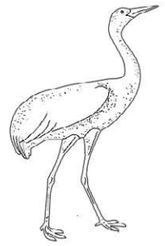
Urban Green



Black Redstart
Phoenicurus ochruros

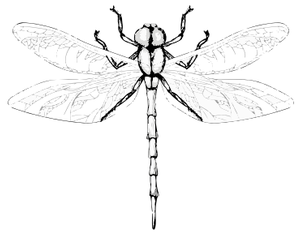


Eurasian Kestrel
Falco tinnunculus

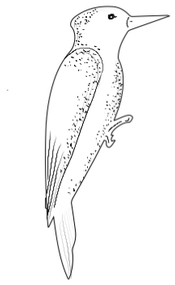


Little Egret
Egretta garzetta

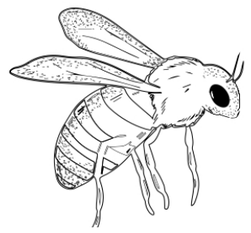
Eastern Gray Squirrel
Sciurus carolinensis



Nomad *Sympetrum fonscolombii*



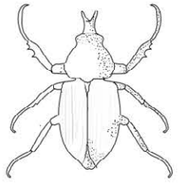
White Wagtail
Motacilla alba



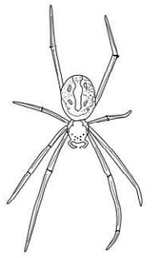
Common Drone Fly
Eristalis tenax

Eurasian Eagle-Owl
Bubo bubo

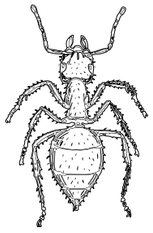
Knapweed Fritillary
Melitaea phoebe



Mediterranean Spotted Chafer
Oxythyrea funesta



Oculate Garbage-line Web Spider
Cyclosa oculata



Ethiop Carpenter Ant
Camponotus aethiops

New relationship between urban green and the social/historical heritage of the city

Even as contemporary cities, such as Rotterdam and Torino, have made huge efforts to connect their historical expansion to their greening processes, there is still a notable blind spot when it comes to producing green elements around the social dimension. In other words, the promises behind greening in the city, follow the traditional approach, in which developers decide what is best for people. Under the perspective of the *Planned Spontaneity* approach, it is precisely here where the green production is failing to deliver authentic translations of urban relationships. As it follows, the urge for a new type of relationships between urban green and the social/historical dimension, makes a call to recognize urban practices that have instinctively been introduced by the community throughout time. As Gandy reflects upon the borders of the Stura river in Torino, as an example of emerging practices around wild urban nature:

“Nevertheless, as the documentary City Veins suggests, the Stura edges are less an “empty space” than a “crossroads of stories”; the stories of sex workers, stray dogs, drug dealers, and consumers, together with the retired meridionali (as Southern migrants were called) who cultivated their vegetable gardens along the river, intersecting with migrants and refugees who—ever since the 1990s—have as a particular atmosphere that encloses and presses upon bodies, creating the sense of a city “gone wild.”” (Gandy, Jasper and Barchetta, 2020, p.173-174)

The recognition of hidden stories and dialogues is also contained in wild urban nature, in the areas that are not traditionally part of the functional and economic poles of the city, in which the lack of regular intervention has allowed a series of different relationships to take place. Moreover, when reimagining spontaneous green bodies in the existing regulatory and development plans, the thesis establishes that is not possible to completely redesign future projects, but it is possible to limit their reach, and set a departure point for spontaneous practices to prevail. The idea behind this *Planned Spontaneity* experiment for the social and historical recognition in green elements, is to challenge future projects by combining them with communal practices, such as emerging urban agriculture, which is present in both Rotterdam and Torino, and it is part of their undeniable industrial and post-war heritage.

For the case of this experiment of *Planned Spontaneity*, around urban agriculture as a cultural practice, the thesis suggests to approach two projects with great potential, in terms of combining preexisting future visions with the recognition of social initiatives that have slowly grown in the city. For the case of Rotterdam, the project of the Hofbogen Park, not only contains the heritage of the old railway but it also represents the opportunity to incorporate new practices for the inclusion of the residential community. Based on the dialogues with the community in the project area in the Thesis Environmental Justice in Greening the Hofbogen, what the exploration is aiming for, in this particular case, is the creation of wild orchards, as new relationships with agriculture. Challenging the traditional and somewhat artificial forms of urban agriculture and incorporating wild nature as a variant. What the residents describe in many cases, is the production of a project that lets them participate in an equitable and fluent relationship with the park, highlighting the opportunity of incorporating spontaneous nature in terms maintenance and wellbeing of the parks ecosystem.

For the case of Torino, the project of Città della Scienza e dell’Ambiente, the implementation of an experiment of communal agriculture in the campus area, wishes to emulate the existing initiatives of communal orchards in the area of Mirafiori. This agricultural cites have their origins in WWII after the bombings in the city, from which the people instinctively recurred to urban agriculture as a form of resiliency in the post-war period. The imaginary also considers the existing character of the project as a higher education infrastructure, and reimagines a relationship between the emerging academic population and infrastructure, with the resident community around the project. Even though this particular experiment of spontaneity in Torino, incorporates many of the technological and educational vision already secured by the municipality, it wishes to give a particular position to communal agriculture in the future panorama. As easy as it might be, to categorize urban agriculture under the strategies and implementation of the sustainable city, it is not the approach this experiment is aiming for. What urban agriculture from the *Planned Spontaneity* standpoint is trying to express, is less about present day notions of green, and more about the value of a communal practice that can only happen when nature and culture meet.

Red Clover
Trifolium pratense

Aegopodium podagraria L.
ground elder

Greater Stitchwort
Rabelera holostea

Maidenhair Spleenwort
Asplenium trichomanes

Common Toadflax
Linaria vulgaris

Bjerkandera adusta
Smoky polypore or smoky bracket

Meripilus gigantes
Meripilus giganteus

Bjerkandera adusta
Smoky polypore or smoky bracket

Argentina anserina
Potentilla anserina

Oxalis corniculata
creeping woodsorrel

Great Stinging Nettle
Urtica dioica

Common Chickweed
Stellaria media

Autumn Crocus
Colchicum autumnale

Three-toothed Orchid
Neotinea tridentata

Greater Plantain
Plantago major

European Field Pansy
Viola arvensis

Autumn Crocus
Colchicum autumnale

Stubble Rosegill
Volvopluteus gloiocephalus

White Dapperling
Leucoagaricus leucothites

Small Balsam
Impatiens parviflora

Chicken of the Woods
Laetiporus sulphureus

Small Balsam
Impatiens parviflora

Greater Plantain
Plantago major

Male Fern
Dryopteris filix-mas

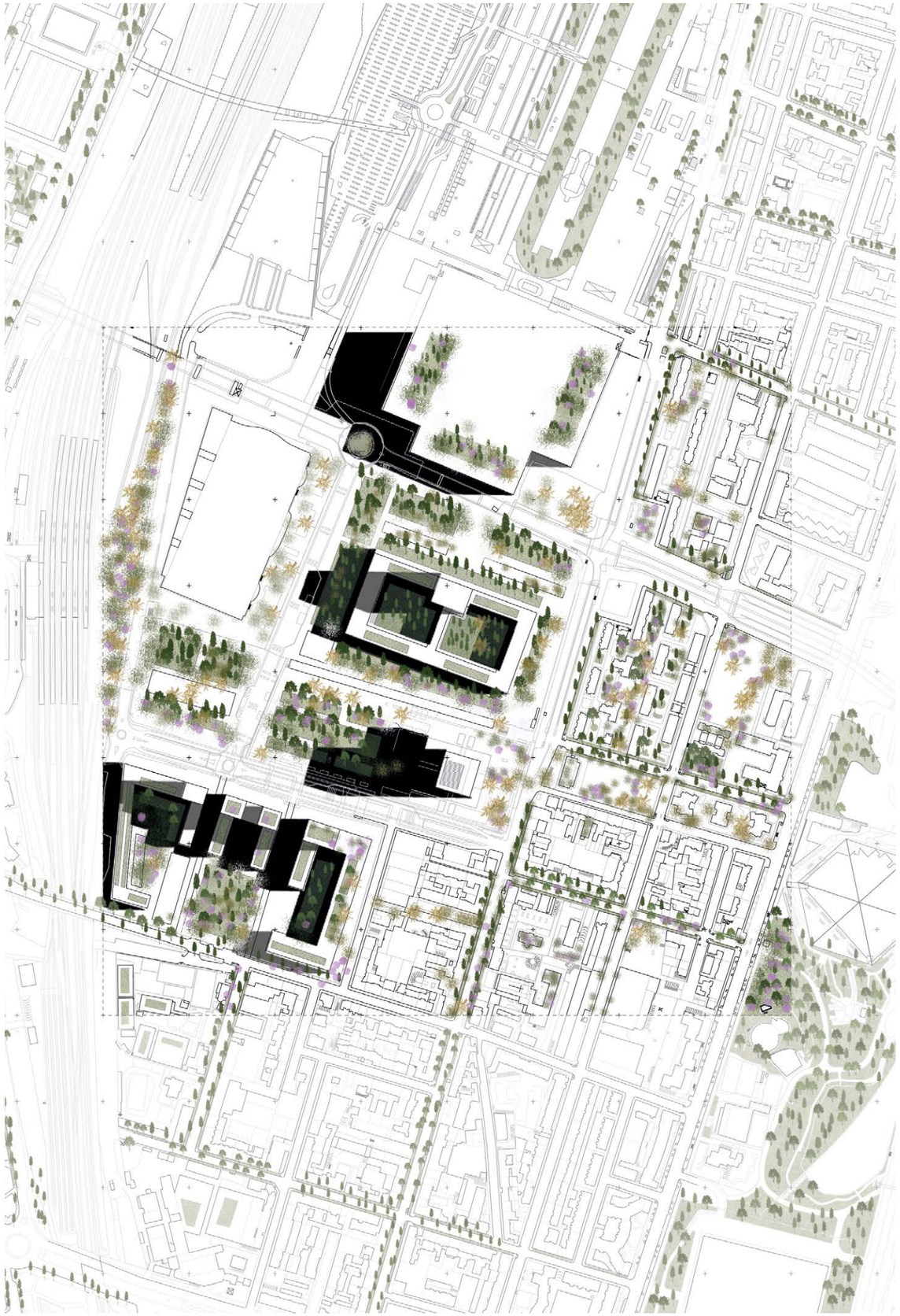
New types of relationships within the current climate crisis and wild nature (reassessing adaptation and mitigation strategies)

Given the modern day urge to find new solutions for the current climate crisis, both Rotterdam and Torino have incorporated mitigation and adaptation strategies in their greening agendas. However, as it has been explained throughout the research, the production of greening in regards to environmental issues, is paradoxically very artificial. Even as cities make an effort to fin urban solutions for climate change, they rarely incorporate wild urban nature as mitigation or adaptation mechanism. As it has been evidenced in both case studies, these strategies are still designed to provide a secure environment for the economic and functional factor to prevail. Moreover, the aesthetics of these so called “nature based solutions”, respond to the traditional implementation carried out by the green orthodoxy, automatically leaving wild nature in a category that is not aesthetically pleasing for the future vision of the city.

Along the same lines, Lucilla Barchetta seeks to bring light to the natural process of degradation that occur in the city as part of the road towards new urban relationships. “Starting from what is perceived as ugly, in these pages I have attempted to reaffirm a messy coexistence in the environment, grounded in the priority of difference and multispecies justice, and directed at crumbling the myth of a single Nature, thus bringing out the kaleidoscope of diversity, biological and social, that make it possible for different urban worlds to meet” (Barchetta, 2021, p.103). In this sense the thesis proposes a denaturalization with the existing values of the postindustrial landscape and single connotation of nature as an object, in order to redefine the relationships between society and nature through different types of greening processes. To drift apart from the artificial solutions that pretend to solve the environmental crisis, and redirect the focus on the resilient urban nature and species that have grown on top of the industrial footprint. To oscillate between the intermediates of the dichotomy is to recognize the plurality in nature. It is an attempt to drift apart from the single concept of green elements as objects in the present and future city, that only responds to functional and economic values. To understand that the recognition of multiple relationships is not only possible, but necessary to change the course of the false promises behind green and learn to coexist in the context of environmental issues.

In the case of this new type of relationship and the urban exchanges that occur around climate change, the thesis makes a call to recognize **the value and potential of spontaneous urban nature as a real “nature based solution”.** For the case of Rotterdam, the experiment will be based on *The Feyenoord Tidal Park,* situated on a particular position in the Delta, making it a typical case of water and land management for the city. Under this perspective the exploration proposes a different approach to the traditional water management, based on a relationship that could also result in a productive exchange in regards to food production and mitigations strategies. Instead of recurring to the traditional production of artificial land, the imaginary challenges land expansion of green areas of the park with floodable algae-based crops. The crops have been conceived as a solution to increase green areas, and moreover to aim for new relationships trough communal practices of agriculture, or more specifically, sustainable aquaculture. The crops could serve as a transition area in terms of water management, allowing the existing tides to carry out their natural process of increasing and decreasing, in regards of the water level throughout the day.

In the case of Torino, the experiment is directed towards the project of *Parco della Salute, della Ricerca e dell´Innovazione*. Given its particular position in regards to the river and its surrounding areas, which have been identified in risk of Urban Heat Island. What the imaginary portrays, is the possibility to bring the possible green area of the predesigned project to the surrounding residential infrastructure, connection the future health pole with its context. Moreover, the characterization of these green element is conceived as mitigation strategies for the UHI phenomenon, which is an increasing issue in the in the area, regardless of its proximity to an existing park and the river itself. The approach towards these mitigation strategies, allows use of spontaneous urban nature as new green bodies to fight heated surfaces, conceiving the growth of a possible “urban jungle”. The idea behind a wild urban environment could be understood as a sensible response, given the possible temperature rise and fluctuation in the water level of the Po river, due climate alteration. The recolonization of space of natural bodies, could allow a more sensible type of relationship with the emerging environmental issues, even within the framework of the sustainable city. In this imaginary the production of green, proposes to surpass the conceived area of the existing project and allow a larger urban ecosystem, that includes residential areas and the ecological corridor of the Po in a panorama of drastic climate change.



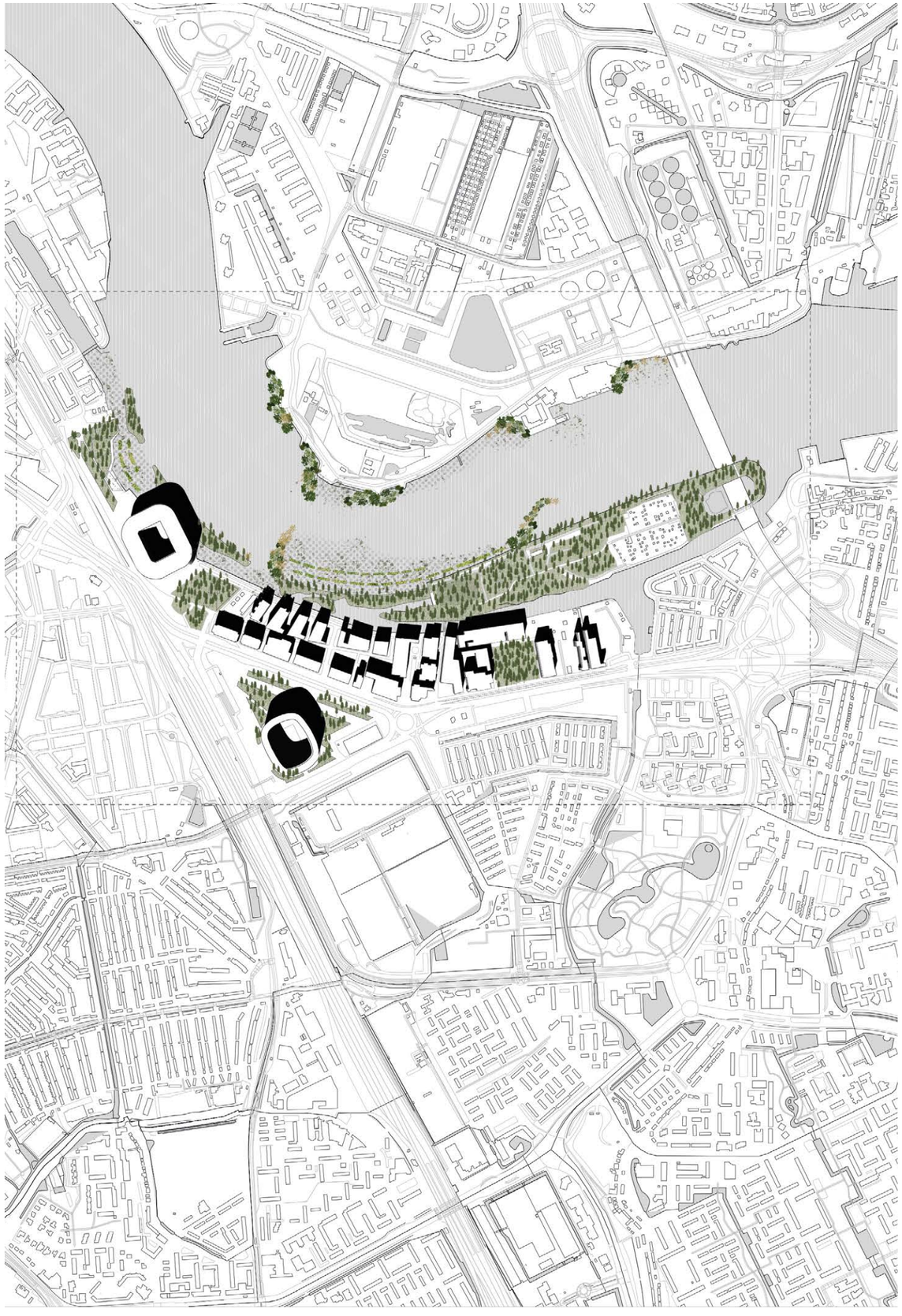
New relationships within the climate crisis: adaptation and mitigation strategies
Turin, Parco della Salute, della Ricerca e dell`Innovazione

Spring cinquefoil
Potentilla neumanniana

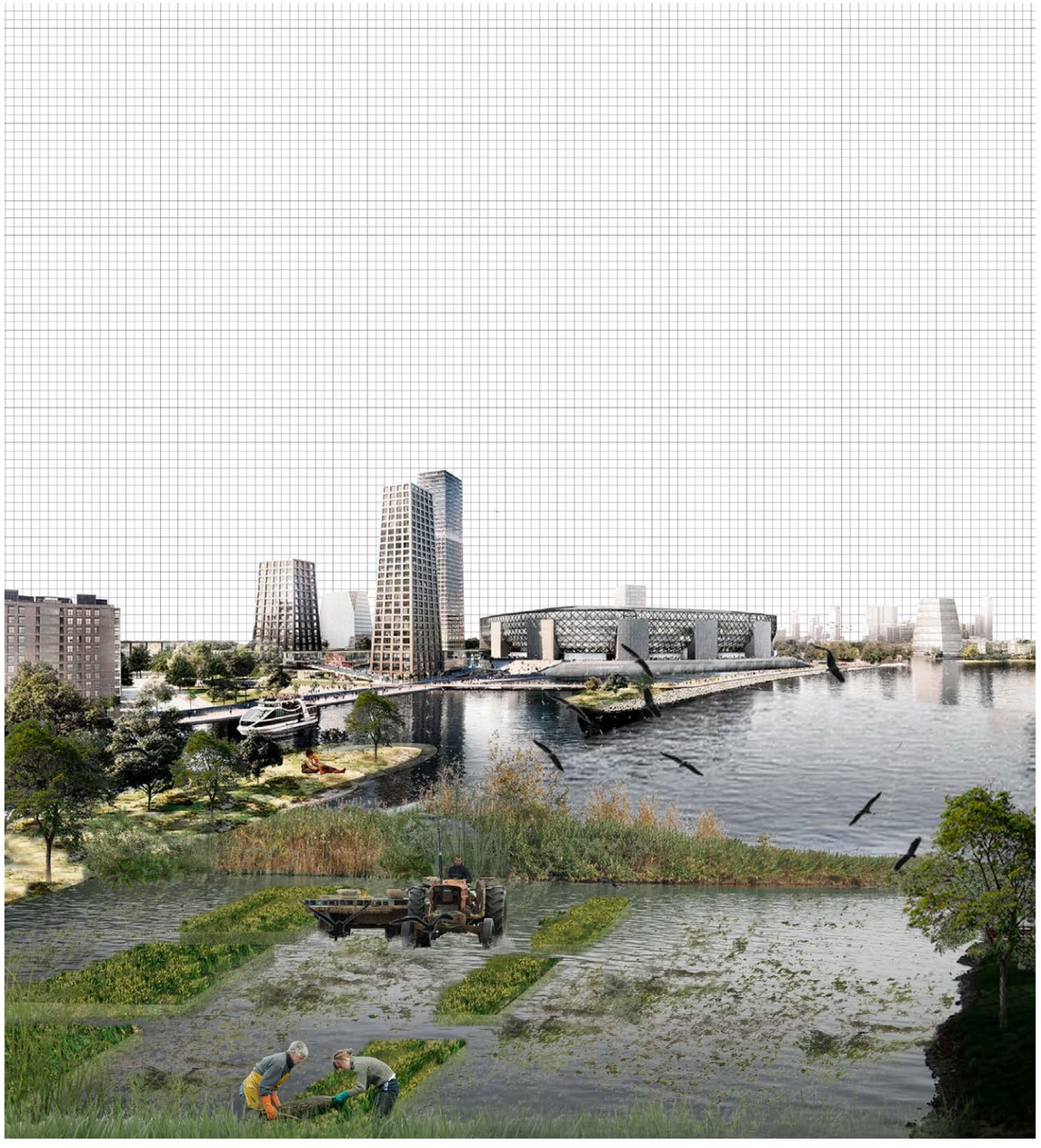
common mugwort
Artemisia vulgaris L.

Sorrel
Rumex acetosa

Hoary cress
Cardaria draba



New relationships within the climate crisis: adaptation and mitigation strategies Rotterdam, Feyenoord tidal park



Urban Green

Bladderwrack
Fucus vesiculosus

Knotted WrackFucus
Ascophyllum nodosum

Japanese wireweed
Sargassum muticum

elkhorn sea moss
Kappaphycus alvarezii

Reflections around an experiment of Planned Spontaneity

As the thesis arrives to the end of the general exploration and experiments that where carried around Urban Greening in Rotterdam and Torino, it is of great relevance to clarify once again, that the idea behind such an exercise was not a comparison. Instead, the main aim was to place them in a position from which the study could explore new futures within the context of contemporary cities. In this manner, the thesis has always been produced from a qualitative perspective, allowing the relational dimension to shape the course of the investigation, rather than an exact or quantitative evaluation of green elements in the city. this approximation allowed a general structure that initially followed a complex theoretical and philosophical framework, followed by the application of the finding into the post-industrial European urban context and subsequently leading the results to an experiment of planned spontaneity in the case studies.

Even if grounded on a solid literature, the proposed imaginaries and suggestive concepts urgently need, of course, a technical development and a whole study of its own. For this reason, the thesis limits its reach to design suggestions of small scenarios in specific projects and portions of the cities, only to give an idea of how they might allow new types of urban exchanges to take place. These exchanges are based on both the understanding of the functioning of the dichotomy, always proposing to fight the static connotation of the object and aim for a multiplicity of relationships between society and nature, as it has been sustained all throughput the study. Furthermore, the incorporation of the concept of *Planned Spontaneity* in the imaginaries, gave the last push towards a new definition of urban greening, challenging traditional ways of developing green infrastructures and the paradox of sustainability. Only in this sense, it was possible to think outside the constructions that progressively materialized single narratives and explore new ways to envision urban futures. But more importantly new ways of envisioning urban relationships in the irreversible post-industrial landscape and regulatory delimitations. In other words, challenging urban greening rooted in the connotation of the object and oscillating toward a more equitable set of connections.

Only within this horizon, it is possible to imagine what the in-between of the dichotomy would look like, the gray between the subject and the object, the multiplicity of temporalities and relationships around green. Only here there is space for new approaches towards the connections between humans and non-humans, the social/historical dimension and the environmental crisis. Even with this investigation it is not possible to say that it is the only way of experimenting with new urban realities, the panorama around gray and green bodies still remains as a complex set of variables that struggle to find balance among each other. However, this exploration does aim to be a departure point to arise the urge to challenge and question the current ways of greening the cities. Most certainly, rethinking society's relationships with nature will eventually allow new productions of green, guiding urban translation to a more sensible urban ecosystem.

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