

The geography of vertical forests

Exploring the green city



Master Thesis

Human Geography – Urban Geography Track

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Master Thesis

Title: The geography of vertical forests: Exploring the green city

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Date of submission: February, 2019

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Faculty: Geosciences

Programme: Human Geography

Track: Urban Geography

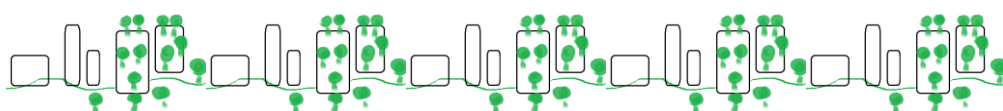
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Abstract

The *Bosco Verticale* in Milan is the world's first vertical forest. This green building typology is now arising in cities around the globe, as a manifestation of the green city discourse. In the Netherlands, the concept has also been warmly embraced, by the cities of Utrecht and Eindhoven. Yet little is known on the lived dimensions of this recent spatial phenomenon. In this explorative study, the development of the *Bosco Verticale* is traced. The spatial practices and lived experiences of this building and the surrounding public spaces, by local residents and the people encountering the building in their daily lives, are investigated. These are confronted with conceptions and intentions of spatial professionals and authorities in regards to designing and developing vertical forests in the Netherlands. This study critically analyses the multiple meanings of the *Bosco Verticale* and its role in urban daily life. It is argued that local residents may benefit from the development of vertical forests, provided that they are enabled and encouraged to experience these green building from surrounding public (green) spaces. This study thus reveals that vertical forests can have a positive impact on the everyday experiences of the urban landscape.

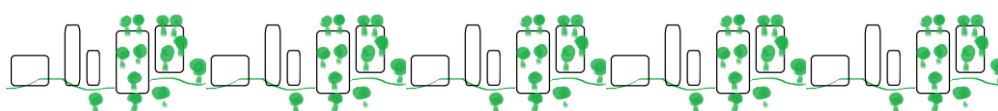
Keywords: vertical forests, Bosco Verticale, green city, lived experiences, eco-gentrification, urban landscape

Abstract

De geografie van verticale bossen: Op verkenning in de groene stad

Het *Bosco Verticale* in Milaan is 's werelds eerste verticale bos. Dit type groene gebouwen duikt wereldwijd op in steden. In Nederland is het concept inmiddels ook omarmd, in de steden Utrecht en Eindhoven. Er is echter nog weinig bekend over de ervaringen en beleving ten aanzien van dit nieuwe ruimtelijke fenomeen. In dit exploratieve onderzoek wordt de achtergrond van het *Bosco Verticale* in kaart gebracht. De beleving van dit gebouw en het gebruik van de omliggende openbare ruimten, door buurtbewoners en stedelingen die het gebouw tegenkomen in hun dagelijks leven, worden onderzocht. De resultaten worden geconfronteerd met de ideeën en intenties van ruimtelijke professionals en overheden, met betrekking tot het ontwerpen en ontwikkelen van verticale bossen in Nederland. Dit onderzoek vormt een kritische analyse van de verschillende betekenissen van het *Bosco Verticale* en de rol die het gebouw speelt in het dagelijks leven in de stad. Er wordt beargumenteerd dat buurtbewoners profijt kunnen hebben van het ontwikkelen van een verticaal bos, mits zij gefaciliteerd worden deze groene gebouwen te ervaren vanuit omliggende (groene) openbare ruimten. Dit onderzoek toont daarmee aan dat verticale bossen een positieve invloed kunnen hebben op de alledaagse beleving van het stedelijk landschap.

Trefwoorden: verticale bossen, Bosco Verticale, groene stad, beleving, ecogentrificatie, stedelijk landschap

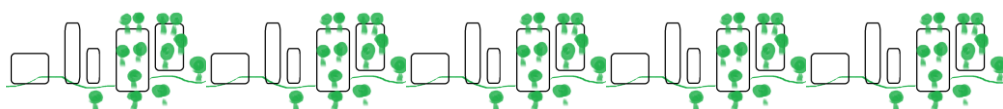


Abstract

La geografia dei boschi verticali: Alla scoperta della città verde

Il *Bosco Verticale* di Milano è il primo bosco verticale del mondo. Questa visione di un edificio verde oramai si sta estendendo nel panorama mondiale. Nei Paesi Bassi il concetto è già stato abbracciato sia dalla città di Utrecht sia da Eindhoven. Nonostante ciò, poco ancora si conosce di questo nuovo fenomeno paesaggistico. In questa ricerca esplorativa, vengono investigati la sua origine e il suo significato. Inoltre vengono esaminate le esperienze di chi vive attorno. I risultati sono confrontati con le concezioni e le intenzioni degli ideatori e attori principali, per quanto riguarda il disegno e lo sviluppo dei boschi verticali olandesi. Si sostiene infatti che i residenti locali potranno usufruire dello sviluppo di un bosco verticale, a condizione che tali progetti siano inseriti in un'area che contenga del verde nelle vicinanze. Da questa ricerca si evince inoltre che i boschi verticali potranno avere un effetto positivo sulle esperienze quotidiane di chi ci vive attorno.

Parole chiave: Bosco Verticale, boschi verticali olandesi, città verde, esperienze vissute, ecogentrificazione, paesaggio urbano



Preface

“Una città è un paesaggio umano che guarda l’orizzonte urbano”

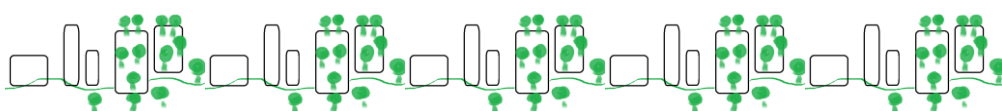
“A city is a human landscape looking at the urban horizon”



Cities are a constant source of inspiration. Four years ago, I found myself wandering through the streets of Milan, as I was given the opportunity to study a semester in this incredible city. Apart from experiencing Italian life, I experienced the exciting hustle and bustle of living in a metropolis, for the first time. From the tramway, I had my first encounter with the *Bosco Verticale*. By that time, the façades were not yet full-grown. Nevertheless, I really appreciated the concept of the building, for it fired my imagination. Imagine that one day our cities would be filled with similar green architecture.

My passion for cities and profound interests in urban daily life made me decided to start studying Urban Geography, which brought me to the city of Utrecht. As I started to think about a research topic for my Master Thesis, I came across articles about a vertical forest to be constructed in Utrecht. Soon, another vertical forest was announced, which was to be constructed in Eindhoven, the city I did my Bachelor's programme. Therefore, this study is not only a critical analysis of three vertical forests, it also represents three urban stories, from cities have been my own habitat.

This research has been a great adventure. The more I discovered about vertical forests, the more I become fascinated about these buildings and their multiple meanings. Interestingly, I had never really entered the *Isola* neighbourhood before starting this research project, even though I visited the *Bosco Verticale* more than once. I have fallen in love with this charming neighbourhood and its welcoming residents, who have made me feel at home during my fieldwork. To the incredible *isolani* I met and interviewed around the *Bosco Verticale*, I would like to say: Grazie di cuore.



Back in the Netherlands, I had the honour to meet and interview many inspiring professionals and experts, involved in or interested in the design and development of the Dutch vertical forest. I would like to thank all of them, in helping me unravel vertical forest piece by piece. I hope the results of this study will be valuable and inspiring.

I would like to thank my supervisor Irina van Aalst, for the support and confidence during this research project. Lastly, I want to thank all my family and friends, who have supported me during this project. Francesco, il mio caro amico milanese, grazie per tutto. Melissa, grazie mille per il tuo aiuto. Martijn, bedankt voor je scherpe blik. Lieke, bedankt voor alles, ik had mij geen beter studiemaatje kunnen wensen de afgelopen zeven jaar. Manon, bedankt voor de onvoorwaardelijke steun.

This research project has been an enjoyable experience. I hope that vertical forests will fascinate and inspire anyone who reads this thesis.

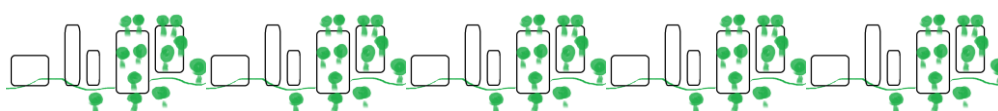
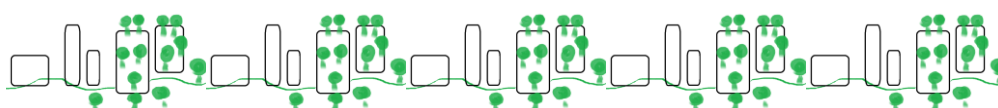


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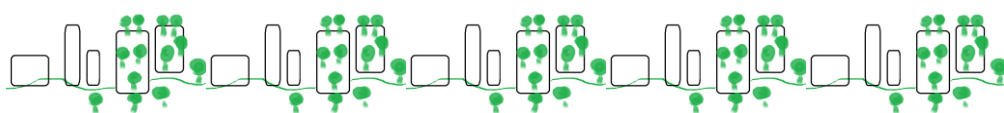
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PART I



Research design



Chapter 1 – Introduction

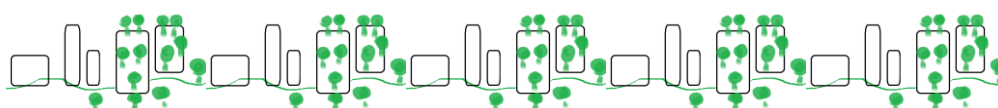
“Perhaps it will be the city that reawakens our understanding and appreciation of nature, in all its teeming, unpredictable complexity” (Jacobs, 2004).

The *Bosco Verticale*, which translates to ‘Vertical Forest’, is a building in Milan, Italy. It is a “vegetated skyscrapers” (Varrato, 2017, p. 35), which was completed in October 2014 and has been an icon on Milan’s skyline ever since. The building consists of two separate towers reaching heights of 111 and 78 metres. The towers are composed of 26 and 18 floors respectively and the façades are covered with plants, shrubs and trees (Figure 1). The building was designed by Milanese architect Stefano Boeri in cooperation with architects Giovanni La Varra and Gianandrea Barreca, as a project for Boeri’s architectural firm *Stefano Boeri Architetti* (SBA). The edifice was completed a year before the World Expo 2015 took place in Milan. It is positioned at the edge of the gentrifying *Isola neighbourhood*, being part of the large-scale urban restructuring project *Porta Nuova*.



Figure 1: Left: The two towers of the *Bosco Verticale* in Milan, right: the façade of the *Bosco Verticale*

Boeri’s firm SBA focuses on what they call ‘urban forestry’: creating forests and other green spaces within cities. In 2017 SBA announced a call for action regarding urban forestry, in preparation of the first World Forum on Urban Forests. This World Forum is a four-day event which was held in November 2018 in the Italian city of Mantua (*Mantova*). SBA’s (2017) call for action has been directed to, among others, architects, urban planners, universities, botanists, real estate developers and geographers. These different stakeholders have been invited to consider that increasing the number of trees within cities would contribute considerably to solving problems caused by climate change. A recent study by MacNaughton et al. (2017) has shown that the ‘green building movement’ offers great climate and health benefits. According to SBA (2017), urban forestry is an ingenious way to absorb CO₂. Besides, urban forests could strongly reduce (noise) pollution and energy consumption while at the same time reducing heat stress in urban environments. As SBA (2017) explains: “we have the duty to launch a global campaign on urban forestry in order to multiply the presence of forests and trees in our cities”.

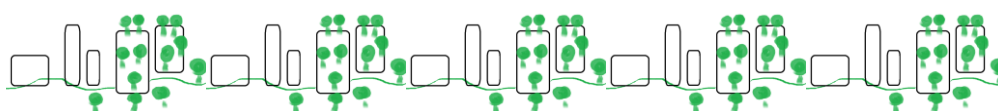


The concept of the vertical forest, which has also been called ‘treescraper’, has caught the attention of the media after the completion of the original *Bosco Verticale* in Milan. In contrast to many contemporary skyscrapers, the two towers have no truly spectacular forms. Yet the *Bosco Verticale* has been characterised widely as an iconic building and was declared Best Tall Building of 2015 by the Council on Tall Buildings and Urban Habitat. The Council declared that the *Bosco Verticale* has “one of the most intensive living green façades ever realized”, which creates “an urban ecosystem that encourages interaction between the flora, fauna, and the apartments’ residents” (2018) The number of trees and plants the two towers are covered with equals an entire hectare of forest (Boeri, Brunello, & Pellegrini, 2011, p. 107).

According to Short (1996, pp. 431-433) representations of the city are built up around several key themes. The four “super images” Short (1996, p. 432) distinguished are the fun city, the green city, the culture city and the pluralist city. These days, city branding is not merely used as a form of advertising the city, but used as an instrument “to reinvent or rewrite the city”, as Hubbard (2006, 87) puts it. In light of this idea, the recent emergence of the vertical forest within the urban landscape could be considered as an attempt to reposition the city, by (re)confirming the image of an environmentally friendly ‘green city’.

Philosopher Gerald Raunig (2013) has stated that the *Bosco Verticale* served as such a ‘green’ instrument in redeveloping and ‘reinventing’ *Porta Nuova* in the *Isola* neighbourhood. Despite such criticisms, SBA has been ‘expanding’ the concept of the vertical forest on a global scale after the completion of the *Bosco Verticale* in Milan. A vertical forest in Nanjing, China, is under construction. Many more are planned, in for instance Tirana, Lausanne and Paris. Cities in the Netherlands have warmly embraced these ‘treescrapers’ as well. In the city of Utrecht, the project *Wonderwoods* won a contract for the city’s future ‘Healthy Urban Quarter’. Designed by SBA and Amsterdam based MSVA Architects, the two towers will be a landmark in the redevelopment of the *Beurskwartier*, emphasising the city’s ambitions concerning ‘healthy urban living’ (City of Utrecht, 2017). The city of Utrecht therefore seems to present itself as a green city, corresponding to one of the super images defined by Short (1996, pp. 431-433) two decades ago. Recently, the city of Eindhoven announced the future construction of the first vertical forest dedicated to social housing. This is exceptional, for the original *Bosco Verticale* merely houses the ‘rich and famous’ (Biaggi, 2016). The construction projects in Eindhoven was enthusiastically reported on by Italian media (Dezza, 2018; Seghetti, 2018), as it will provide the less fortunate with the luxury of a green building.

In this study, the perceptions and lived experiences of the *Bosco Verticale* in Milan are examined, focussing on local residents and frequent users of its surrounding public spaces. These perceived and lived dimensions of the vertical forest will be confronted with the conceptions of ‘spatial professionals’ and urban authorities, among which architects, real estate developers, urban governors and green building experts, focused on the two future Dutch vertical forests in particular. As the *Bosco Verticale* in Milan is currently the world’s only existing vertical forest, the findings of this study can be applied to future developments of vertical forests in the Dutch cities of Utrecht and Eindhoven. Therefore, this study will provide an outlook for the impact these building will have on the urban landscape and urban daily live. The research will also result in (policy) recommendations on vertical forests.



Research questions

In this study, the main question under discussion is:

“To what extent do vertical forests alter the everyday experiences of the urban landscape?”

The research question is divided in a number of sub-questions, which will address specific aspects of the research theme. The following sub-questions will be examined in this study:

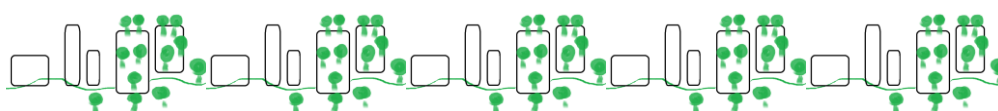
1. *“What are the conceptions and intentions of spatial professionals and authorities in regards to the design and development of vertical forests?”*
2. *“What are the spatial practices in the public spaces surrounding the Bosco Verticale?”*
3. *“How is the Bosco Verticale in Milan experienced by local residents and the people encountering the building in their daily lives?”*
4. *“What can be learned from the lived experiences of the Bosco Verticale in Milan in regards to the future vertical forests in the cities of Utrecht and Eindhoven?”*

The first sub-question is addressed by a multi-method approach. Firstly, two books written by the architect Stefano Boeri (2011; 2015) and a number of journalistic accounts will be analysed to reveal the conceptions and intentions of the architect and others spatial professionals who have been involved in the design and development of the *Bosco Verticale* in Milan. Secondly, semi-structured interviews with those involved in the design and development of the two Dutch vertical forests, which are still to be constructed, will be conducted. This will provide an outlook on the conceptions and intentions of spatial professionals and authorities.

The second sub-questions is addressed by conducting systematic observations in the public spaces which surround the *Bosco Verticale* in Milan, for a period of three months, at varying times of the day. This fieldwork will give an impression of the spatial practices. Besides the observations, street interviews with local residents and people spending time in these public spaces on a regular basis will be conducted. During these interviews, the respondents will be asked about the common and conspicuous spatial practices in the public spaces surrounding the *Bosco Verticale*.

The data gathered by conducting the street interviews will provide insights into the lived experiences of local residents and the people encountering Milan’s vertical forest in their daily lives. The data third sub-question will be addressed based upon these data gathered.

Lastly, the insights into the lived experiences of the *Bosco Verticale* are confronted with the conceptions and intentions of spatial professionals and authorities in regards to the two Dutch vertical forests. This will lead to policy implications and recommendations for those involved in designing and developing the two Dutch vertical forests.



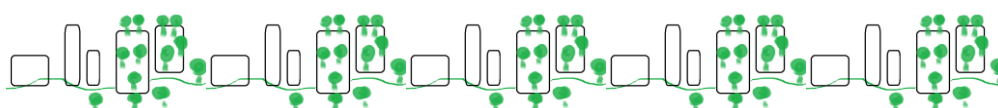
Relevance

Whereas the popular media have paid much attention to the *Bosco Verticale* and future vertical forests throughout the world, this upcoming phenomenon seems to have attracted little academic attentions so far. Boeri's call for action is legitimate, yet seems to be based predominantly on assumptions regarding the ecological and technological features of this new type of building. With his interesting art project 'Support Your Locals' Italian photographer Lorenzo Tricoli (n.d.) has attempted to visualise the personal experiences of social transformation in *Isola*, the gentrifying neighbourhood in which the *Bosco Verticale* is located. Bovati and Heidari Afsari (2018) have argued that social outcomes of ecological practices in Milan such as the *Bosco Verticale* should be further examined. It is still unknown how the *Bosco Verticale* is interpreted and lived by its inhabitants (Giacomello, 2015). Likewise, local residents' experiences of the building have remained unexplored.

Notwithstanding the little attention academics have paid to the 'lived' dimensions of the *Bosco Verticale* and its surrounding so far, vertical forests are a compelling research subject for geographers, as they arguably have a great impact on urban landscapes, and the ways in which these are lived by urbanites. As Hubbard (2006) states, "the townscape can be interpreted as 'written' by architects, developers and planners who operate within specific socioeconomic context, its architectural styles and forms highly suggestive of the relations of culture, power and landscape" (p. 83). The city is a "container of messages" (Short, 1996, p. 395), which is produced and consumed, written and read. Geographers should not underestimate the significance of the skyscraper in daily life, McNeill (2005) argues. He pleads for a thorough geographical investigation of these type of buildings, as geography has the potential to research this neglected spatial phenomenon from a holistic perspective (p. 44).

Following the work of Lefebvre (1974/1991) on the production of space, one could argue that great differences may occur in the ways vertical forest, as 'green spaces' are conceived by architects, real estate developers and urban planners, and the ways in which there are experienced and 'lived' by the urban public. Discrepancies between spatial professionals' conceptions and citizens' experiences may have unintended or undesired implications, and could even lead to the contestation of vertical forests. Therefore, it is relevant to delve into the multiple meanings of this upcoming architectural and spatial phenomenon. Vertical forest and their impact on urban daily life, however, have hitherto been neglected in the field of geography. The aim of this research is therefore to address this research gap, by providing insight into the way(s) in which vertical forests are used to 'rewrite the city' (Short, 1996, p. 395) and what impact these building will have on the daily lives of urbanites.

As more and more vertical forests are arising in different cities around the globe, studying people's experiences of these buildings can be of great importance for the work of 'spatial professionals', among which architects, real estate developers and policymakers. As this study is focused on the lived experiences of the *Bosco Verticale* and its surrounding public space, insights into the edifice's impact on urban daily life is gained. As ever more vertical forests are to be constructed around the globe, it is relevant to examine whether this promising building typology changes citizens' perceptions and experiences of their urban environment. This particularly applies to the Dutch context, since two vertical forests will soon arise in the cities of Utrecht and Eindhoven. This study will result in (policy) recommendations, based on lessons learned from examining the lived dimensions of the *Bosco Verticale*. This could create more awareness of the implications of designing and developing vertical forests and similar green building typologies.

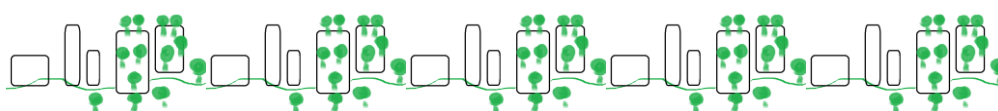


Reading guide

This report consists of two parts, divided into six chapters. The first part addresses the research design and is composed of three chapters. The current chapter is an introduction to the research topic, followed by the research questions. The scientific and societal relevance will also be explained in the current chapter. The second chapter is concerned with a theoretical framework, in which literature academic literature on several key themes concerning green buildings and spaces are discussed from a geographical perspective. This literature review will result in several theoretical assumptions concerning vertical forests. In the third chapter, the research methodology used in this study is outlined.

The first section of this report is followed by an intermezzo, in which a typical 'week in the green city' is portrayed. This ethnographical sketch, inspired by the work of Loughran (2014), gives an impression of the spatial practices in the public spaces that surround the *Bosco Verticale* in Milan.

The second part of this report concerns the empirical research, which is composed of chapter four to six. The fourth chapter consists of an investigation of the history and context of the *Bosco Verticale* in Milan. This is followed by an analysis of the data gathered by conducting the systematic observations and street interviews, focusing on lived experiences and spatial practices. Then, in the fifth chapter the data gathered by the interviews with spatial professional involved in the design and development of the vertical forests in the Dutch cities of Utrecht and Eindhoven are presented. Finally, in the sixth chapter the lived experienced of the *Bosco Verticale* are confronted with the conceptions and intentions of the two Dutch vertical forests, which will result in the conclusions. The chapter is also concerned with a discussing and (policy) implications and recommendations. A personal reflection on the research process will follow after the sixth chapter.



Chapter 2 – Theoretical framework

Green city, green buildings

“If the city itself can be read as a text or considered as a discourse in which power is inscribed, then it behoves us to think about the message being projected *by architecture*” (Crilley, 1993, p. 13).

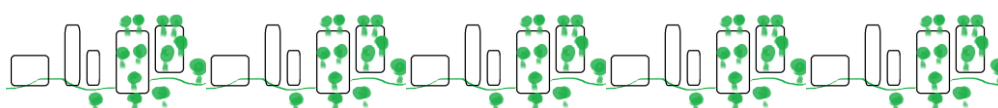
Cities are re-imagined as natural habitat and are responding to changing needs and expectations of (potential) residents (Braiterman, 2010). Meanwhile “architects have been in a race to build the greenest buildings” (Al-Kodmany state, 2014, p. 11), which has resulted in the construction of many green skyscrapers on a global scale. In this “new era where urban life is reconnecting with the natural worlds” (Braiterman, 2010, p. 81), cities with plenty of green space hold a competitive advantage within the global economy. Braiterman (2011) foresees limitless opportunities to brand cities as ‘green cities’ in this respect.

Short (1996, pp. 431-433) already argued two decades ago that representations of the city are built up around several key themes. The four ‘super images’ Short (p. 432) distinguished are the fun city, the green city, the culture city and the pluralist city. Although one might argue that today the ‘smart city’ should be added to this framework as a fifth super image, Short’s classification is still valid and relevant in city branding these days.

Present-day city branding is not merely used as a form of advertising the city, rather it has become an instrument “to reinvent or rewrite the city” (Hubbard, 2006, p.87). City branding strategies focused on green urbanism and developing sustainable, environmentally friendly and resilient cities could be considered attempts to (re)confirm the image of a ‘green city’, in a world of “inter-urban competition” (Harvey, 1989). Recently, within the field of urban planning and city branding, a ‘green city discourse’ seem to have emerged. As a sub-discourse of the overall society ‘sustainability discourse’, this green city discourse is composed of urban imaginaries. Not only have these imaginaries been applied to “imagine a world different from the existing one, and “inhabit” this world through mental representations” (Beckert, 2013, p. 236), they have become manifest in the urban landscape as well.

Lefebvre (1974/1991) argued that people are ‘obsessed’ by nature, via the filter of memory. “Every natural detail, or object is valued even more as it takes on a symbolic weight” (Lefebvre, 1974/1991, p. 30). Such symbolism may explain why urban forestry and urban greening play an important role in re-imagining the city as a green city, which is worth living in, not only for young urban professionals but also for families (Simson, 2008, p. 102).

In the light of such statements, one could argue that the green city discourse recently has materialised in the urban landscape, considering the recent emergence of ‘resilient cities’, new green spaces and (visibly) green edifices. According to Lefebvre (1970, p. 283) a building is a cultural object which supports a certain ideology. Buildings, as cultural objects in the urban landscape, are therefore part of a ‘sign language’ which prescribes a certain social order. Buildings are laden with meaning and, as argued in the introductory quote by Crilley (1993, p. 143), projecting messages to the urban public. Seen in this light, green architecture is an instrument for cities to spread a ‘green message’.



In urban decision-making a general agreement seems to have been reached, in which the ‘green city’ discourse’ has become the hegemonic discourse. Hence, the ‘green city’ discourse has won the “discourse competition” (Sharp & Richardson, 2001, p. 198) and is currently crystallising in urban development. Architecture, green architecture in particular, may play a crucial role as “the social art that can give material form to dreams for an alternative future”, as urban geographer Maria Kaika (2011, p. 989) has put it. These ‘dreams’ concern a green, sustainable future, in which cities are housing happy and healthy citizens.

As Kaika and Thielen (2006) have argued, the ideology of using (urban) design “as a siren calling for further urban renaissance” is widespread nowadays, stimulating further production of “new ‘iconic-to-be’ buildings” (p. 66). This results in ever more urban landscapes in which, as Harvey (1989, p. 14) would put it, the spectacular and the playful prevail.

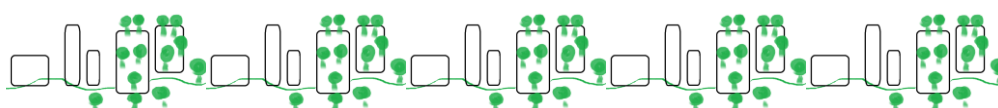
Kaika (2010, p. 989), drawing on the work of Castoriadis (1975/1987), has argued that a distinction can be made between the ‘radical imaginary’ and the ‘actual imaginary’. The actual imaginary refers to the ability to express an identity which has previously been constructed, whereas the radical imaginary can be defined as the ability to come up with new images and symbols for something that is “still in the making”. In this perspective, iconic architecture functions as a “totem” in moments of economic or political crisis or social change, which “contributes towards configuring and instituting new significations for societies and institutions in need of re-invention” (Kaika, 2010, pp. 457-458). Kaika (2010) argues that the role of architecture in creating a “new radical imaginary” or confirming existing power relations is significant.

As the green city discourse has become a dominant new radical imaginary in urban governance recently, this implies that the contemporary ‘green city’ should have (ever more) iconic green buildings to ‘reinvent’ itself. The adage “form follows power” (Kaika & Thielen, 2006) seems to apply strongly to green architecture; power is inscribed into urban space by erecting green buildings as ‘urban totems’ (Kaika, 2010, 2011). Such buildings are futuristic, in the sense that they are ‘future-oriented’, alternative, pioneering and experimental (Heinonen & Minkinen, 2016). These urban totems could be considered the “innovative private shrines” (Kaika & Thielen, 2006, p. 61) of these days, which “constitute the language for a society in search of a new identity, for corporations and cities in need of re-branding” (Kaika, 2010, p. 458). The emergence of many green buildings throughout the globe may prove that radial ‘green’ imaginaries have now entered what De Certeau and Giard (1998, p. 138) have described as the “production-consumption system”. This system is dominated by “real-estate agencies, project developer [and], architectural firms” (p. 138) produces urban spaces, which become consumption goods thereafter.

Vertical forest: eco-icons & eco-gentrification

The towers of the Vertical Forest not only offer their inhabitants an extraordinary perspective from within the apartments. Cyclically changing their skin according to the diversity of the plants and their disposition with respect to the sun’s axis, the Vertical Forest also offers a changing landscape to city dweller.

This quote from Stefano Boeri (Boeri, Musante & Muzzonigro, 2015, p. 65) shows how the *Bosco Verticale* is conceived by its creator as an ever-changing urban icon. The appearance of this green landmark changes which changes over time, as the building’s “skin” follows the seasons. The metaphor of a forest is used to describe this new building typology and not ‘park’ or ‘garden’, since “entire trees, not just green plants are growing on the balconies” (Heinonen & Minkinen, 2016, p. 169) of these verdant towers. The *Bosco Verticale* represents one of the most extensively green tall building ever realised (Giacomello, 2015, p. 12)

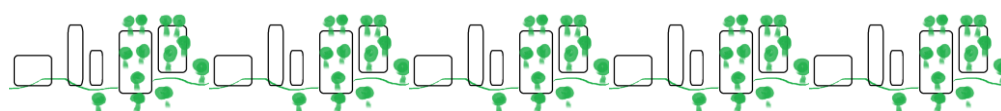


Spaces seem to differ in their degree of 'participation' in nature, for they may embrace nature, but as well reject or even destroy it (Lefebvre, 1974/1991, p. 232). Whyte (1990, pp. 136-137) already found that some urban spaces seemed to reject nature, as he discovered that architects sometimes preferred less trees, or smaller ones, in the public spaces surrounding their masterpieces, so these trees would neither block the view of the building nor hide its statements. In case of the *Bosco Verticale* the exact opposite seems to be true. As architectural historian Charles Jencks (2006, 2011), has observed, there is a tendency in iconic (Post-Modern) architecture to refer to nature, which leads to the construction of what he describes as "cosmic icons". Although "architects are relatively powerless" in the ecological issues of these times, among which global warming and environmental pollution, Jencks (2011, p. 130) argues that they can still use an "expressive approach to the green issue", which may be applicable to vertical forests.

Vertical forests, as well as any other type of 'green buildings' in which trees and plants are incorporated, seem to strongly embrace nature instead of refusing it; these constructions are thereby participating in and alluding to nature. Jencks (2011, pp. 134-137) shows that the white 'Flower Tower' in Paris (Figure 2), designed by Édouard François and completed in 2004, is an example of a building in which an expressive approach to ecological, environmental and social issues is used. The exterior of this building, consisting of 30 social housing apartments, is decorated with hundreds of pots on the edge of its concrete frame, which are partly filled with bamboo and partly filled with plants residents can personally choose. The Flower Tower could arguably be described as a predecessor of the vertical forest.



Figure 2: The Flower Tower in Paris, designed by Édouard François and arguably a predecessor of the vertical forest.
Source: Maison Édouard François.



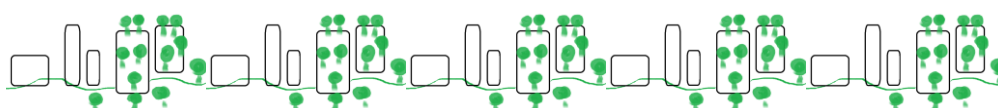
Three decades ago urbanist and New Yorker ‘people-watcher’ William H. Whyte (1988) already stressed that there “are many good reasons for having lots of trees, but for climatic reasons alone we should plant more of them – big ones, too – on the streets and spaces of our cities”. Greening urban spaces may indeed provide beneficial outcomes for society. The protection of biodiversity, improving air and water quality, reducing (noise) pollution and the so-called ‘urban heat island’ effect, are often stressed as beneficial outcomes of greening cities. Green spaces are also considered to be more adoptive to excessive rainfall and to have less risk of flooding (Project for Public Spaces [PPS], 2006, p. 33).

Such arguments are still common in legitimating further promotion of the concept of the ‘green city’. As argued by PPS (2006) “the effects of green and open space on mental health will only grow in importance as rates of urbanization swell worldwide” (p. 35). One of the opportunities to brand the green city, as mentioned by Braiterman (2011), is ‘greening’ urban spaces that have hitherto been underused and often unimagined as green spaces, among which the rooftops and façades of buildings. Cities that are rapidly growing are forced to create “sky-rise greenery” in their “search for new open spaces” (Yuen & Hien, 2005, p. 263).

While the greening of urban space has slightly moved in vertical directions, the emergence of iconic buildings has rapidly expanded in both western and non-western cities around the globe. Cities aspire to put themselves on the map as world cities (Kaika & Thielen, 2006, p. 66), in order to attract investments, tourists and inhabitants-to-be, who are either highly qualified or well-to-do. Kaika and Thielen (2006, p. 66) argue that iconic buildings, which are often public-private buildings designed by so-called ‘starchitects’, are strategically used as ‘logos’ for a city. Cities have been aspiring for the Bilbao effect, the much-discussed positive impulses the iconic Guggenheim museum may have had on Bilbao’s urban generation (e.g. Plaza, 1999). This has resulted in the production of ‘post-card views’ of the city (Kaika & Thielen, 2006, p. 66), as well as an urban “race-for-the-sky” (Heinonen & Minkkinen, 2016, p. 172). Green buildings, in this respect, may serve as logos to promote the contemporary green city, (re)confirming its green image. As Sklair (2012, p. 26) has argued, “iconicity works and persists because the buildings in which it inheres are built by architects and teams of others to symbolize something (possibly several things) apart from the programme (functions) of the building itself”.

The ‘greenscraper’ trend, as described by Al-Kodmany (2014), fits in with these statements, as it has led to the emergence of ‘eco-iconic’ tall buildings on a global scale. Based on an analysis of contemporary green towers, Al-Kodmany (2014) argues that the new aesthetics of ‘eco-iconicity’ “does not necessarily mean manipulating forms to compete for attention” (p. 12). Rather these architectural designs are determined by innovative and green design principles, resulting nevertheless in forms that are “interesting and eye-catching” (p. 12).

Hence, it can be argued that the ‘living’ building typology, of which the vertical forest is an extreme example, has created a new architectural language. In this architectural language the built environment is highly participating in nature, as both ‘organic’ and ‘artificial’ elements are combined and intermingled. All iconic buildings are metaphors, however implicit such metaphors may be (Jencks, 2001, p. 203). In this sense, the organic metaphors of vertical forests are conveying messages about aspects of a possible future ‘green’ society and transferring meaning (Heinonen & Minkkinen, 2016).



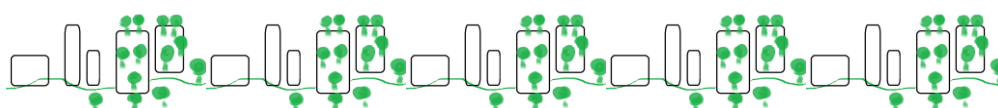
A critical remark to such statements is that green skyscrapers may also justify property developer's aspirations to construct tall buildings (McNeill, 2005, p. 52). Furthermore, scholars (e.g. Bryson, 2013; Haffner, 2015; Millington, 2015) recently have been warning for the social outcomes of processes of 'ecological gentrification' (also 'eco-gentrification'). This concept, introduced by Dooling (2009), is used to describe the tendency of real estate developers to both promote and justify real estate project by claiming that these new constructions are sustainable and offer environmental benefits, whereas they will also increase gentrification of areas (Quastel, 2009). Likewise, urban environmental governance can result in 'eco-gentrification', as Quastel (2009) has pointed out:

Gentrification may arise due to new forms of urban environmental governance as languages of sustainability become applied to the entrepreneurial city. Urban governance trends toward urban revitalization, attracting wealthy residents, or cleaning up industrial sites that otherwise have gentrifying effects are now cast as green. (p. 702).

Eco-gentrification of brownfields could for instance foster gentrification processes in surrounding residential neighbourhoods, which may lead to the displacement of local residents due to rising housing prices and rents, as Bryson (2013) argues. Dooling (2009) states that greening urban spaces for 'ecological reasons' does not necessarily results in benefits for all inhabitants of a city, thereby challenging the idea that green spaces "are universally enjoyed". Bryson (2013) pleas for academic attention regarding the relations between green spaces or green buildings and contemporary gentrification processes.

Critics have stated that the High Line in New York, a former obsolete railway which has been transformed into an elevated park, "is now suffering from its own success", as Haffner (2015) has put it. Despite the many positive outcomes in terms of attracting tourists and contributing to citizens' well-being, Millington (2015) has called attention to the social effect of the project, such as rising costs of living in the surrounding areas. One of the unintended effects is that the High Line may ultimately result in growing residential segregation (Haffner, 2015). In his ethnographic sketch of the High Line in New York, Loughran (2014) has shown that the design and surveillance of the High Line discourages certain undesired spatial practices. As Loughran (2014) has emphasised, this ostensible 'public' park does not necessarily provide the local community with a new green space, but has become a space for the "privileged", which puts constraints on undesired spatial practices and excludes the undesired and less fortunate. Therefore, the High Line has reinforced urban inequalities (Loughran, 2014). Similarly, Rigolon and Nemeth (2018) found that local authorities and real estate developers used Chicago's 606 Trail, a former railway transformed into an elevated park, to accelerate future real estate developments. By promoting sustainability and public health, these coalitions cleared the way for eco-gentrification in the neighbourhoods that surround the park.

Curran and Hamilton (2012) have argued that cities should strive to be "just green enough", in order to avoid such paradoxal socioeconomic outcomes of new green spaces. This statement is based on their case study of the Greenpoint neighbourhood in Brooklyn, New York. Curran and Hamilton (2012) found that local long-term residents and gentrifiers worked together in cleaning up the pollution in their neighbourhood. This strategy is contesting eco-gentrification, as the case study has shown that green initiatives do not necessarily have to lead to the displacement of working-class, long-term residents.



Regarding the first vertical forest in Milan, Heinonen and Minkkinen (2016, p. 169) have argued that the *Bosco Verticale* could be considered the *pièce de résistance* of the city's "eco-conceptualisation", a concrete manifestation of a green city discourse aimed at transforming the city into "BioMilano" (Boeri et al., 2011). The edifice is "meant to clean up Milan's reputation of being the most polluted city in Italy" (Heinonen & Minkkinen, 2016, p. 169). According to Heinonen and Minkkinen (2016, p. 169) the *Bosco Verticale* is a metaphor in this sense, which conveys a message to the urban public, that is contemporary urban lifestyles are to be combined perfectly with living amidst the forests and enjoying the delights of nature. Hence, vertical forests seem to represent a new generation of eco-icons within the urban landscape.

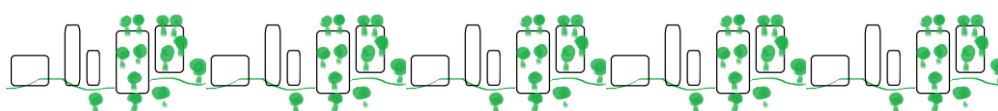
However, it should not be overlooked that such eco-icons can have a tremendous impact on urban daily life in the long term, by processes of eco-gentrification. The construction of eco-icons could eventually lead to the displacement of local residents. This may be an undesired and unplanned result of urban regeneration, but eco-icons could also disguise a hidden agenda of commercial interests and even economic exclusion. Therefore, in examining the creation of new green spaces in cities, it is important to determine who actually benefit from such green initiatives. Although the living building typology is often argued to offer ecological benefits, which can be enjoyed by all, research is needed to reveal the true role of eco-icons within the urban landscape.

Green buildings & embodied experiences

Green architecture refers to the use of eco-friendly materials and embracing sustainable technologies (Al-Kodmany, 2014). Hence it does not necessarily include incorporating plants and trees into buildings. Woodward (2011), director of London's Garden Museum, clearly explains the motives of Boeri and other architects to incorporate greenery into their design regardless:

Boeri acknowledges that there is an alternative model of "green architecture": design solutions and "smart appliances" for capturing energy and channelling that are invisible behind smoked glass and steel frames. Put another way, a building can meet the new environmental guidelines without the planting of a single shrub. But the "living architecture" movement goes beyond the current legislation: it is about how cities should feel. (p. 4)

If building vertical forests is not the only motive to construct buildings in a sustainable, green or eco-friendly manner, then an explanation for such an architectural language should indeed be sought in the expected effect of these buildings on the urban 'public'. Such an effect of the (urban) environment is addressed within the field of environmental psychology. Within this field of research, the work of Rachel and Stephen Kaplan (1989) has been influential. These scholars have been interested in the following issue: "Is the effect of nature on people as powerful as it intuitively seems to be?" (p. IX). They found evidence for overall human preferences for landscapes that reflect nature compared to scenes that are more visibly influenced by humans, even though preferences may differ widely in different communities, cultures or contexts (Kaplan, 1984; Kaplan & Kaplan, 1989). Nature's aesthetic factors are associated with pleasure. Besides, nature helps people explore their environments in an effective and comfortable manner. Furthermore, the researchers found that nature can be "inspiring, awesome, tranquil, or calming" and they linked these qualities to the concept of a "restorative environment" (Kaplan & Kaplan, 1989, p. 175), an environment that helps people to recover from mental fatigue and stress.

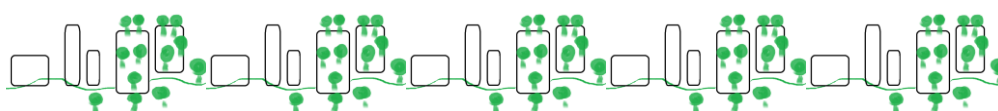


According to Kaplan and Kaplan (1989), a restorative environment is made up of four key elements. Firstly, a restorative environment enables people to (briefly) escape their daily routines as well as crowds and noises, while they experience a sense of 'being away' and can clear the head. Secondly, a restorative environment has 'extent', its components are interrelated and together form a coherent setting, which is large enough to constitute "a whole other world" (Kaplan, 1995). "There is the promise of continuation of the world beyond what is immediately perceived" (Kaplan & Kaplan, 1984, p. 184). Thirdly, human fascination is an important factor, which is closely related to the first two elements mentioned. Restorative environments enable experiencing an environment that is coherent but mysterious, which can be experienced without using directed attention (Kaplan & Kaplan, 1989). In other words, such an experience is effortless (Kaplan, 1984). The last element of a restorative environment is its 'combability', a concept that refers to the extent to which an environment meets one's demands and expectations, as well as the extent to which one's purposes are suitable for this specific environment. Kaplan and Kaplan (1989) have pointed out that natural environments often possess those components that are characteristic of restorative environments. Kaplan (1984) has also argued that urban natural environments may provide restorative experiences. The concept of a restorative experience elucidates human preferences for nature; even in an urban setting people seem to be attracted to nature for it may "permit moments of recovery from the strains of the day" (p. 196). In sum, a restorative environment may have therapeutic qualities (Nilsson, Sangster, & Konijnendijk, 2011, p. 8). Recent research confirms that those who live in a green environment in general have better self-perceived health (Maas, Verheij, Groenewegen, De Vries & Spreeuwenberg, 2006).

Environmental psychologists White and Gatersleben (2011) studied human preferences for natural elements in architecture. Their study confirmed that houses covered with building-integrated vegetation, green roofs and façades in this case, were perceived as being more beautiful compared to houses without any vegetation. The participants tended to have a preference for 'green buildings' and mentioned that such buildings possess more affective quality than buildings without vegetation. Furthermore, building-integrated vegetation was perceived as being restorative.

Gobster and Westphal (2004) found that people can deeply care for nature in their surroundings. Such deep 'caring', in the case of the study a greenway in the neighbourhood, may apply to green landscapes in general. Health benefits of parks are applicable to any type of green space, according to Project for Public Space (PPS, 2016, p. 33), a renowned non-profit organisation which promotes and studies placemaking. Such findings and statements implicate that spatial professionals should strive to create green spaces in cities that are clean, aesthetically appealing, safe and accessible. These "human dimensions", as Gobster and Westphal (2014) call them, may strongly improve the quality of life of urbanites. Furthermore, greenery in public space may also create a greater sense of identity. PPS (2016, pp. 31-32) states that greenery of public spaces may enforce the unique identity of a place, while encouraging residents to reflect on its distinguishing characteristics.

As argued in the introductory quote by Woolworth, the emergence of vertical forest may be linked to the 'lived' city, feelings, to emotions and to 'sensing the city'. The same seems to be true for experiences of urban greenery and nature within cities, as research in the field of environmental psychology has shown. This is where the post-phenomenological concept of 'embodiment' comes in. Central in post-phenomenological analyses is the body (Ash & Simpson, 2016, p. 54), as the active human is emphasised (Idhe, 2009, p. 23). Post-phenomenology is linked to a shift from focusing on the phenomenological concept of human 'consciousness', towards embodied experiences. As Pallasmaa (2007) stresses, embodiment cannot be considered "a secondary experience" (p. 99), as the body and the sense are the essence of *any* human experience. Nevertheless, in the literature 'embodied experience' and (bodily) lived experiences are terms used to indicate that these concepts differ from mere perceptions and (visual) observations.



According to architecture critic Juhani Pallasmaa (1999/2014, p. 331), contemporary architecture is often isolated in “disembodied vision”, which has detached architecture from its “multisensory essence”. There has been a shift in focus from the city as it is ‘lived’ (on the ground), to the urban skyline, the city as it is ‘viewed’ (Kaika, 2011, p. 978). Buildings are these days merely “conceived and confronted through the eye rather than the entire body” (p. 331), which Pallasmaa (1999/2014) has described as “ocular-centricity”.

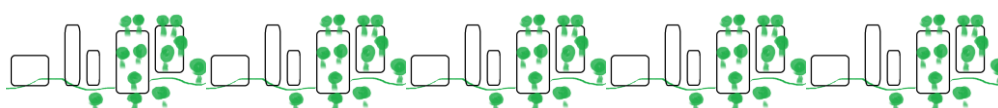
Furthermore, Pallasmaa (1999/2014) and Kaika (2011) have observed the end of architecture as a ‘social art’, caused by a lack of societal engagement and the absence of a ‘mission’ among architects. Notwithstanding this, Boeri’s designs are imbued with idealistic ideas of an alternative future for urban societies. Boeri (2016), conceives vertical forests as “project for the environmental survival of contemporary cities” (p. 61), for instance. This conception seems to be based on the idea that “contact with the natural environment can provide an antidote to some of the unhealthy aspects of an urban lifestyle” (Nilsson et al., 2011, p. 6) . Boeri is putting such ideas into practice. One could argue that Boeri is a contemporary ‘tree fighter’, a term introduced by Whyte (1990, p. 137), by which he underlined that cities were in urgent need of such green advocates. Contact with the natural environment can provide an antidote to some of the unhealthy aspects of an urban lifestyle, and there is a growing realization that this should influence the way that our surroundings are planned and managed. As urban thinker Jane Jacobs (2004) observed, (landscape) architects these days are “viewing mankind and nature as partners, with nature as the senior partner and human beings the apprentices”.

In this perspective, vertical forests are considered to be “living buildings” (Woolworth, 2011), which affect the haptic sense, evoke emotions and embrace nature. As Heinonen & Minkkimen (2016) have argued, for instance, the *Bosco Verticale* invites pedestrians and cyclist to come close” (p. 169) because of the appealing green façades. Vertical forest may possess qualities of a restorative environment and are aesthetically appealing, given human preferences for nature.

Studies on health benefits of (urban) green spaces may be applicable to vertical forests too, which could have promising outcomes. A large body of research seems to imply that embodied experiences of vertical forests will undoubtedly be more positive than similar experiences of non-verdant buildings within the urban landscape. Nevertheless, such positive and healthy effects require further academic attention and investigation. It is still unknown how the *Bosco Verticale* is interpreted and lived by its residents for instance (Giacomello, 2015, p. 18). This is even more the case when considering those who can only enjoy its green exteriors: nearby residents and people frequently visiting the public spaces surrounding the building. Thus, empirical data regarding perceptions and embodied experiences of vertical forests are needed, in order to either substantiate or reject such assumptions on its beneficial outcomes.

Space as a product

Following the work of Lefebvre (1974/1991), which has been of great importance in urban geography, one can argued that space is a social product. However, space is “a very peculiar product” (Lethovuori, 2011, p. 74). Any society produces and appropriates its own particular space. This implicates that “space is not only a means of production, but also a means of control, domination and power” (Lefebvre, 1974/1991, p. 26). Already produced spaces can be ‘read’ or ‘decoded’ by members of a society, therefore there is a ‘process of signification’ which results in ‘spatial codes, as Lefebvre argued. In discussing vertical forests as a spatial phenomenon, namely the manifestation of the green city discourse, the work of Lefebvre is elucidating, for it may explain the different dimensions of vertical forests.



Lefebvre coined a spatial triad to explain the production of space. This conceptual triad provides an insightful framework, which can be used in analysing the multiple meanings of space. According to Lefebvre (1974/1991, pp. 38-39) space is produced at the interplay of three elements: spatial practice, representations of space and representational space. These correspond to *l'espace perçu*, *l'espace conçu* and *l'espace vécu*: space as it is perceived, conceived and lived. Figure 3 shows the dialectical relationships within this spatial triad, which are never stable.

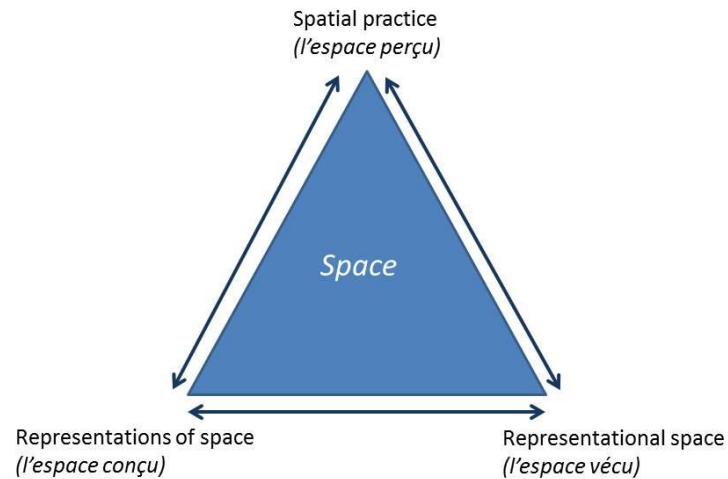


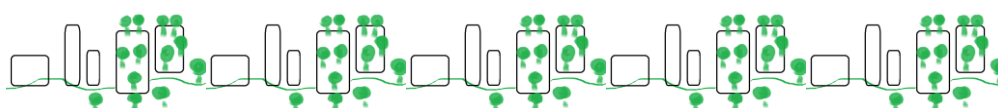
Figure 3: The dialectical relationships within Lefebvre's spatial triad.
 Source: Lefebvre (1971/1991), edited by the author.

Spatial practice refers to *l'espace perçu*; space as it can be perceived in daily reality, a space that is observable. This includes physical aspects of space, as well as daily routines, routes and networks that connect the various spaces of daily (urban) life. Spatial practice thus relates to both the production processes of space and the built environment as a result of these processes (Leary, 2009, p. 195), it concerns both production and reproduction.

Representations of space refer to *l'espace conçu*; space as it is conceived, conceptualised, planned and designed. This is the space of scientists and (planning) professionals, among which engineers and planners, therefore it is a technocratic space. According to Lefebvre, conceived space is the dominant space in any society.

Representational space (also spaces of representation) is the element which refers to *l'espace vécu*; space as it is experienced and directly lived through its associated image, symbols and meanings. This lived space is the space of inhabitants and users (of the city). Representational space is also the space of emotion, memories and dreams. According to Lefebvre (p. 42) "representational space is alive: it speaks". Lived space is linked to the body, as is perceived space. However, as far as "bodily lived experiences" (p. 40) are concerned, culture intervenes. Bodily lived experiences (representational space) therefore differ from mere perception of space (spatial practice).

Lefebvre's spatial triad shows how space is produced at the interplay of these three elements. Already constructed spaces thus have material (perceived), conceptual (conceived) and lived dimensions (Harvey, 2006, p. 281), which should all be taken into account when studying the various meanings of space. Although Lefebvre (1974/1991) did argue that conceived space is dominant in any society, conceived space is "not omnipotent and can be contested, subverted and appropriated in dialectical tension with the other two components of the spatial triad" (Leary, 2009, p. 195).



To elaborate on the 'dialectical tension' that exists within the spatial triad, the distinction between 'tactics' and 'strategies' made by French philosopher Michel de Certeau (1990) is helpful. According to De Certeau, strategies are calculations and manipulations, which articulate ensembles of (physical) places. Strategies are the articulation of certain power relations. Therefore, strategies are linked to Lefebvre's representations of space, as these are a technocratic space; space as it is conceived, calculated and designed. When technocratic ideas are materialising in the built environment, they enter the realm of spatial practice, as they become concrete.

In contrast to strategies, tactics concern the usage, manipulation and deviation of places, which have been created, divided and imposed by technocratic strategies. Therefore, tactics stem from representational space, as they concern the usage and experience of space, the way(s) space is 'lived' by inhabitants. When inhabitants, as everyday users of space, imagine an alternative space, a space that differs the way(s) in which it is conceived and then materialised, they are in fact contesting the dominant (conceived) space. Their tactics may in this case eventually change the dominant perception of how a particular space should be, which can result in an altered spatial practice. Tactics may thus counter 'official' strategies, as spaces can be (re)appropriated by tactics.

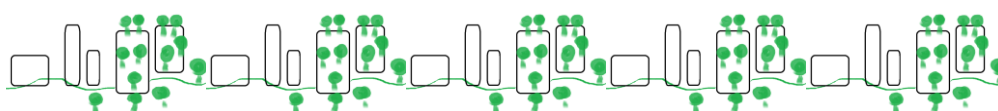
Urban space should not be considered stable, as argued by Lefebvre (1974/1991). Rather urban space should be seen as an ongoing process, something that is constantly 'in the making' and can only be analysed by taking into consideration its multiple meanings and dimensions. As Lefebvre wrote, changing life and changing society is impossible without "the production of an appropriate space" (p. 59). In the view of Lefebvre, this statement is true for fighting pollution and respecting nature and the environment, for instance.

Green assumptions: A synthesis

Following the work of Lefebvre (1974/1991) it can be argued that the green city discourse, in order to fulfil its promise of an alternative and sustainable future and truly change (urban) society, requires the production and appropriation of a particular urban space. Vertical forests seem to be a product of the green city discourse, the materialisation of a radical urban imaginary and the crystallisation of architecture's regained mission to be a social art. In discussing the multiple meanings of vertical forests, it is relevant to take into account the multiple meanings of this upcoming spatial phenomenon. Vertical forests have been conceived first; they appear in designs and visualisations made by architects, which are representations of space. Subsequently, when such designs come into being in constructions, they enter the material realm, they become spatial practices, as they can be perceived. These two different dimensions are part of urban strategies. Finally, vertical forests are experienced and lived by the urban public, and these bodily lived experiences are linked to representational space. By urban tactics, conceptions of vertical forests may be contested, which could lead to an altered spatial practice.

Based on the literature on iconic and futuristic architecture, it can be assumed that vertical forests are both conceived and lived as true eco-icons, which are conveying messages of an alternative, green future. However, perceived negative outcomes of eco-gentrification may also impact the ways in which vertical forests are experienced by local residents and the people encountering such buildings in their daily lives. Vertical forest may represent power, as they originate from a "production-consumption system" (De Certeau & Giard, 1998, p. 138), in which people may feel relatively powerless, dominated or even displaced.

Taking into consideration the literature in the field of environmental psychology, it can be assumed that vertical forests possess qualities to grow into restorative environments, which contribute to people's happiness and well-being. These living buildings may appeal to many and fulfil an important role in their daily lives, given human preferences for buildings covered in green and people's tendency to care about green spaces in their surroundings.



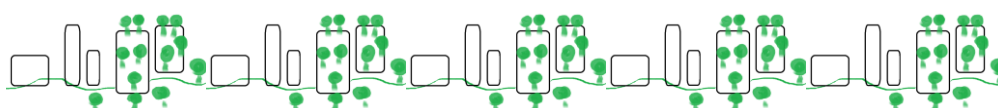
Chapter 3 – Methodology

The *Bosco Verticale* was chosen as a case study in this research, for it represents the origin of a new building typology and it is the only vertical forest constructed so far. It was assumed examining the uses and experiences of this particular building can enhance understanding of vertical forests as a building typology in general. It was expected that insights gained from investigating the *Bosco Verticale*, despite cultural and contextual differences, can also be applied to future vertical forest, among which the Dutch vertical forests to be constructed in the cities of Utrecht and Eindhoven.

A multimethod approach then was employed in conducting this explorative case study. In September, October and November of 2018, fieldwork was conducted in Milan. Several journalistic accounts and two books written by the architect Stefano Boeri (2011; 2015), were used to examine the architect's conceptions of the *Bosco Verticale* and vision on Milan, which he has baptised 'Bio-Milano', as well as other key actors' conceptions of the building. In addition to these resources, the books *Diari in attesa* (Reporting System, 2008) and *Fight-specific Isola* (Brizioli et al., 2013) were analysed. The first concerns an interesting project at the border of journalism, art and urban geography. The book visualises and describes a research conducted in 2008, when the radical transformations in *Isola* had only just taken off and the *Bosco Verticale* was still a sketch. The latter is a critical work written by the opposition of *Porta Nuova* and the *Bosco Verticale*, which has been useful in reconstructing the history of the *Bosco Verticale* and its urban context.

The fieldwork included an ethnographic research of the *Bosco Verticale* and its surroundings. The interesting work of Loughran (2014) on the High Line in New York was used as an inspiration. The ethnographic study started with systematic observations for a period of two weeks, in which the *Bosco Verticale* was visited every day. The observations were conducted in blocks of thirty minutes. Locations were varied, but often two blocks were conducted subsequently at the same site, in order to gain insight into variations in behaviour and discover peak hours in the public spaces surrounding the *Bosco Verticale*. Both the weather conditions and the temperature were noted for each time block, as it was assumed that these may have an impact on spatial practice. A short description of the site was noted down, focusing on the physical characteristics of the site. During the observations, frequently occurring behaviour as well as conspicuous activities were noted. The appearance of the people present in the public spaces was registered, focusing on clothing and accessories, as it was assumed these data reveal information on the people's purpose of crossing or visiting these spaces. Depending on the location in which the observations were conducted, the amount of people passing by on bicycles or walking by was noted, to enhance understanding of the function of the public space as a traffic junction. Besides, some remarkable perceived smells and sounds, as well as any other particularities were registered. An observation scheme was used to facilitate the systematic observations (Appendix I).

In conducting the observations, times of the day were varied, to ensure the reliability of the data acquired. The observations were repeated during the weeks after this first two-week period, however less frequent. In total 45 hours of systematic observations were obtained in the ethnographic research. By conducting these observations, insights into the influence of the time of year, the change of the seasons, as well as the weather conditions on the use of the public spaces surrounding the *Bosco Verticale* were gained. During the observations, photos were taken of the *Bosco Verticale* and its surroundings, as well as remarkable and interesting situations. All photos shown in this report were taken by the author, unless mentioned otherwise. An analysis of the data gathered by conducting the observations provided descriptive information about how and by whom the *Bosco Verticale* and the surrounding public spaces are used, and how this varies in time and in different weather conditions.



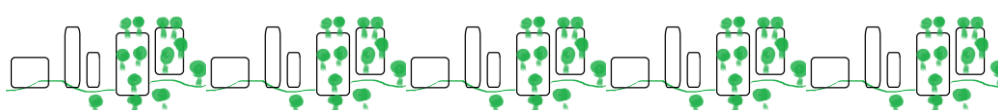
In addition to the systematic observations, the ethnographic research included attending important mundane and occasional events, such as the weekly market in *Isola*, the opening of the *Biblioteca degli Alberi* and the *Isola Kult Festival*, a small-scale neighbourhood event. This enhanced the understanding of the urban and social context in which the *Bosco Verticale* is situated.

The fieldwork also consisted of conducting thirteen semi-structured street interviews over the course of the ethnographic study. The questions posed were based on a general topic list (Appendix II), complemented by individual questions. The participants were local residents living in or close to the *Isola* neighbourhood, people working in the area, people visiting the *Bosco Verticale* and the surrounding areas, as well as local shopkeepers and a street vendor. Tourists, i.e. people who occasionally visited Milan, were not included, as the study was focused on those people who do, or possibly could, encounter the *Bosco Verticale* in their daily lives. Several interviews were held with two respondents simultaneously, and in one interview five respondents participated. The total number of participants was 24. A general topic list was used in conducting the interviews, because of the explorative character of the study. The main topics discussed were personal impressions and ideas regarding the building, the message it may be conveying, the role it plays within the daily lives of the respondents, key words associated with the building, as well as the development of future vertical forests. Many interviews occurred in a somewhat spontaneous manner, when respondents sat down at the same bench as the author for instance, which led to a groups of respondents that were willing to spend time conducting the interview. Except for the interviews with the shopkeepers, the interviews all took place at locations from which the participants were able to see the *Bosco Verticale*. By doing so, the participants were enabled to actively reflect on their embodied experiences of the building while being interviewed. This led to situations in which the participants were closely observing the building and pointing at it while answering the questions. Notes were taken while conducting some of the interviews, whereas some of the interviews were being audio-taped and transcribed. All street interviews were conducted in Italian, to enable the participants to reflect on the topics discussed in their mother tongue, or at least a language more familiar than English. The transcriptions of the interviews were analysed by means of coding, in order to categorise the different aspects discussed (Appendix III). All quotes in this study were thus translated by the author. The observations were used to complement the data collected from the street interviews.

The ethnographic study allowed to perceive and experience the transformations in the area surrounding the *Bosco Verticale*, among which the inauguration of the *Biblioteca degli Alberi*, as well as to perceive the changing of the season (from Summer to Spring) including the influence of weather conditions, and to build to some extent rapport with local residents and shopkeepers, who became familiar faces during the fieldwork.

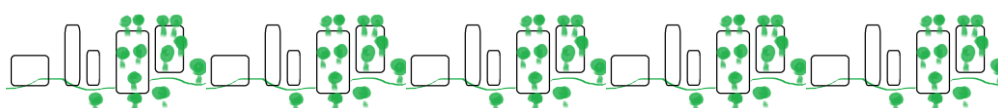
The fieldwork in Milan also included two in-depth interviews with experts, who were approached for their specific knowledge of the *Bosco Verticale* and the local context. One interview was held with a Dutch architect based in Milan, who is also a green rooftop expert and local tourist guide. The second expert interviewed was a local 'amateur historian', born and raised in *Isola*, who has written various articles on the history of the neighbourhood and the *Bosco Verticale*.

The first World Forum on Urban Forests, held in the Italian city of Mantova, was visited for one day, on the 30th of November 2018. The theme of this day of the forum was 'future' and Boeri was one of the event's speaker. Several presentations and a panel discussion were attended, in order to get a grasp of academic and policy discourses on urban forestry, and vertical forests in particular.



To examine main actors' perceptions of the Dutch vertical forests in Utrecht and Eindhoven, ten semi-structured in-depth interviews with professionals involved in the "production-consumption system" (De Certeau & Giard, 1998, p. 138) of these future buildings were conducted. The interviews took place over the course of April, May and June 2018, December 2018 and January 2019. The questions posed were based on a general topic list (Appendix IV), leaving room for specific questions regarding the respondents' profession, expertise and interests. As the Dutch vertical forests are still to be constructed, the interviews were focused on the experts' expectations and assumptions of these future vertical forests. Such expectations and assumptions were partly based on the respondents' personal experiences of the *Bosco Verticale* in Milan, as many of them had visited the building. The main topics discussed in the interviews were the background of the construction projects, the role of the green city discourse in the cities concerned, the expected impact of vertical forests on the urban landscape, the assumed effect of vertical forests on future residents and spectators of the building, as well as a personal vision on the (green) city of the future. By analysing books written by Boeri, attending the World Forum on Urban Forests and interviewing other stakeholders, it was possible to gain insight into Boeri's conception of vertical forests. Furthermore, to examine the ideas and mission of the architectural firm, one of Stefano Boeri Architetti's employees was interviewed. The other respondents were two Dutch (co-)architects, a property developer, a representative of the City of Utrecht, a project manager of a housing corporation, a landscape architect, an investor, as well as general green building experts. These interviews were conducted in Dutch, except for the interview with the architect of Stefano Boeri Architetti, which was conducted in Italian. All interviews were recorded and transcribed. The transcriptions of the interviews were analysed, using coding, in order to facilitate a categorisation of the diverse topics discussed (Appendix V). All quotes from spatial professionals and experts used in this study were translated by the author.

The data gathered by conducting the interviews with key actors and experts were enriched with an analysis of a number of journalistic accounts, to allow for a more critical reflections on the respondents' statements. Furthermore, statement of the different actor were confronted, in order to ensure a factual and complete picture of the conceptions and intentions in regards to vertical forests.



Intermezzo – A week in the green city

Mid-September 2018, Monday morning. Milan's August summer break, in which public life is brought to a standstill apart from tourists visiting the city, is finally over. The city has passed over to the order of the day, all shops and restaurant are open again and the Milanese have to go back to work or school. Nonetheless, temperatures are still high and the city is preparing itself for a long Indian summer, which will follow the upcoming weeks. The *Bosco Verticale* is located at the border of the modern *Porta Nuova* business district and the residential neighbourhood *Isola*. Its verdant façades are beautifully illuminated by the first sunrays of the day (Figure 4).

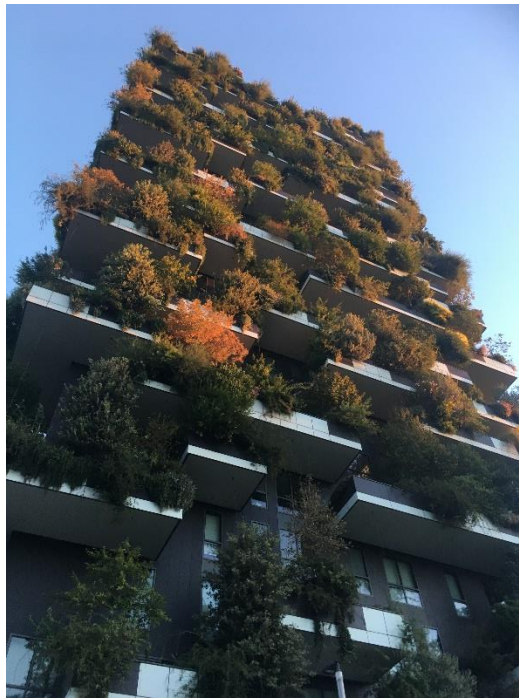
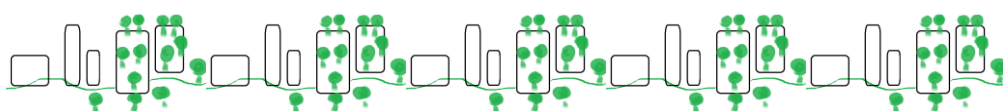


Figure 4: The first sunrays illuminating the green façade of the *Bosco Verticale* in the early morning.

07:15 AM, *Passaggiata Luigi Veronelli*. In front of the *Bosco Verticale* there is a passageway which connects *Isola* to the modern plaza that forms the heart of the *Porta Nuova* district, *Piazza Gae Aulenti*. The future park, the *Biblioteca degli Alberi*, which translates to 'Library of Trees', is still fenced off at both sides of the passageway. The first passers-by in the early morning are in formal or smart casual wear. They are on their way to work, in both directions, but most come from *Isola* and go in the direction of the modern *Piazza Gae Aulenti* and the *Porta Garibaldi* station. A few early birds start off their week with a morning run. Most people who are walking by are on their own. Making phone calls is already a common practice at this early hour. The Milanese are known for being always in a hurry and constantly taken by their jobs, a cliché that seems to be confirmed this morning. From 07:45 onwards there are also many people passing by on their bikes. A few cars enter or leave the underground parking garage underneath the *Bosco Verticale*.



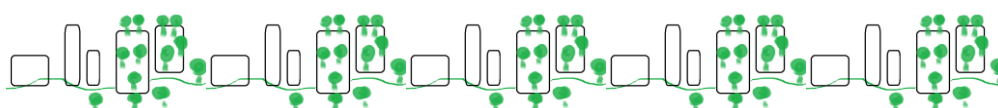
08:30 AM. In half an hour, up to a hundred cyclist go by on the *Passeggiata Luigi Veronelli*, and there are many more pedestrians. At the other side of this pedestrian street, without any motorised traffic, one reaches *Piazza Gau Auelenti*, a circular plaza surrounded by the *Unicredit Tower*, Italy's highest skyscraper. This conspicuous landmark, the headquarters of a large Italian bank, is one of the main destinations of the many office employees passing by. Many use their own bikes, but it is not uncommon to see people using the three bicycle-sharing systems that operate in the city. The station-based Bikemi system, which is provided by the municipality, is most popular, followed by the two more recently introduced free floating systems Mobike and Ofo.

On the side terrace of RED Feltrinelli, probably the best location to enjoy a view on the two towers of the *Bosco Verticale*, some people are having a typical Italian breakfast: coffee, cappuccino or fresh orange juice with a *brioche*, an Italian croissant. The first people studying or working on the terrace arrive. The plaza is always clean and tidy, this morning there is a man on a cleaning machine. From 08:30 AM onwards, there are more groups and less people hurrying to go to work. The terrace is filling up with people too.

09:30 AM, *Giardino De Castillia*. Within this little garden 'at the foot of the vertical forests' one can find benches, a fenced playground for children and a lawn. The garden is demarcated by the two towers of the *Bosco Verticale*, a new luxury apartment building, the cultural centre *Casa della Memoria*, a new office building under construction, and the traditional apartment buildings, the *case di ringhiera*, in which one can find the trendy *Café Gorille*, as well as the traditional lunch restaurant *Trattoria Da Tomaso*, which has been there for almost sixty years. In the morning, there is more people walking by than staying in the garden. Often there are people cleaning the garden around this time. From 10:00 onwards, the first local elderly people arrive, who either arrive in their wheelchair together with their foreign house help, or sit down on the benches, to enjoy the *Bosco Verticale* and the sun, and maybe have a little chat with some familiar faces (Figure 5). They seek out the shade since the sun can be still fierce in September and temperatures can reach up to 30 degrees Celsius. On the small square between the garden, the lower tower of the *Bosco Verticale* and a modern office building which is the headquarter of Google Italia, some office employees have a quick (cigarette) break. On Tuesdays, there is a busy weekly market in *Isola*, where clothes and food are sold. People walk by with shopping bags too.



Figure 5: Elderly women and their foreign home helps gathering around the benches of the *Giardino De Castillia* to enjoy the green spaces and have a little chat.



13:00 PM. It is around lunchtime when the garden gets more crowded. The benches are used by many people, sometimes in groups of two to four, but also individually. They often wear sunglasses. There are people having lunch outside and groups of people in formal wear enjoying a quick walk, maybe towards their favourite restaurant or bar to have lunch together. Some tourists also take a little break in the garden, after taking photos and some selfies of the *Bosco Verticale*. Not only is the a place where locals gather, it is also a place for relaxation for local residents and tourists, as well as people working in and around the *Porta Nuova* district.

Back on *Piazza Gae Aulenti*, there are many people in formal wear walking by (Figure 6). At the *RED Feltrinelli* they are having lunch. Above the café, on the first floor of the *Unicredit Tower*, there is an outdoor spin class for fanatics. On the plaza, people are walking by carrying handbags or backpacks. After 14:00 the lunch rush hour is over.



Figure 6: People in casual and formal wear around lunchtime walking from and towards the *Bosco Verticale*, seen from *Piazza Gae Aulenti*.

15:00 PM. *Piazza Gae Aulenti* and *Passeggiata Luigi Vetronelli* are partly taken over by tourists. The pace of walking is generally slower than in the mornings. The outfits of the passers-by are more casual, sometimes also shorts, skirts and flipflops. Many look up at the *Bosco Verticale*, and those who are in groups will often start discussing the building. Many take photos of the *Bosco Verticale*, the *Unicredit Tower* and the other icons of *la Milano moderna*, with their phones or more 'professional' camera (Figure 7).

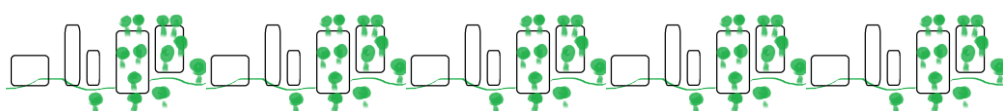




Figure 7: Tourists and passers-by taking photos of the *Bosco Verticale* from the *Passeggiata Luigi Veronelli*

In the garden some tourist pass by as well in the afternoon, sometimes in large groups together with a tour guide explaining the *Bosco Verticale*. Some also do bike tours (Figure 8). From time to time there is a group of school children, who are being taught interesting facts about the green towers (Figure 9). There are sounds from the building under construction. The metro is passing underground, which can be felt and heard from time to time. Looking closely, one can see birds flying around the *Bosco Verticale*. There are bees and butterflies in the garden. The building is sometimes featured in commercials or videos that are being shot in and around the garden. From 17:00 onwards it gets crowded, especially in the playground. Some boys are playing football on the grass, other children are riding on their scooter or balance (bicycle) in circles. Most people are sitting down on the benches, but some may sit down on the grass as well. Phones are often used, and many are making (loud) phone calls. More and more people are walking dogs. African men walk by and try to sell books. People drink water from the drinking fountain.

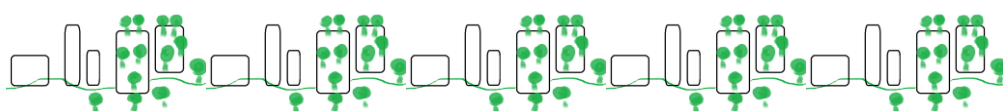
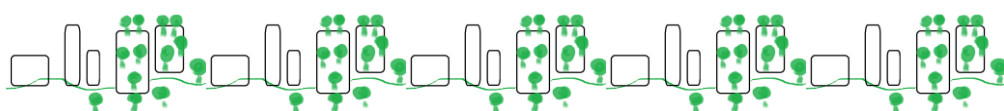




Figure 8: A group of tourist on bikes admire the *Bosco Verticale*, whereas a woman on a bench is making a phone call in the *Giardino De Castilla*.



Figure 9: An outdoor class at the *Giardino De Castilla*.



18:00 PM. South of the *Bosco Verticale*, on *Passeggiata Luigi Veronelli* and *Piazza Gae Aulenti*, the number of cyclist passing by is increasing again. As people are done working, *apertivo* time starts in the *RED Feltrinelli* café and on the terrace, while others are still studying on the terrace. There are more individuals and small groups passing by again. Outfits may get more chic around this time of day. People walk at different paces. Seeing people walking (and some cycling) by and simultaneously making a phone call, while gesticulating, is not uncommon. Others carry shopping trolleys and bags, often the remarkable yellow shopping bags from the *Esselunga* supermarket, which is located in the underground 'food court' underneath *Piazza Gae Aulenti*. The shops around the plaza are still open. From time to time people on Segways and electric scooters come around.

From 19:30 the *Giardino De Castillia* is getting empty. Only a few people on the benches and in the playground remain, some are drinking beers or having a snack. Couples on the benches can be found kissing and hugging. However, there are still people walking by, often with their dogs.

After sunset, red lights start flickering at the façades of all tall buildings in and around *Porta Nuova*. Lights are on in some of the *Bosco Verticale's* apartments, as well as those in the two gyms, one located at the ground floor of each of the two towers (Figure 10) In *Via Gaetano de Castillia* delivery bike riders pass by, some stop to quickly deliver food at the *Bosco Verticale*. The central hallways of the towers can be observed now too, whereas during daytime it is impossible to see what is going on inside. There is a couple of people running in the surroundings. This is peak hour for doing sports. On Tuesday there will be a large group doing an outdoor boot camp workout *Piazza Gae Aulenti*, next to the *Unicredit Pavilion*. The fountains of the plaza are illuminated and the many people gathering around can enjoy a light show.

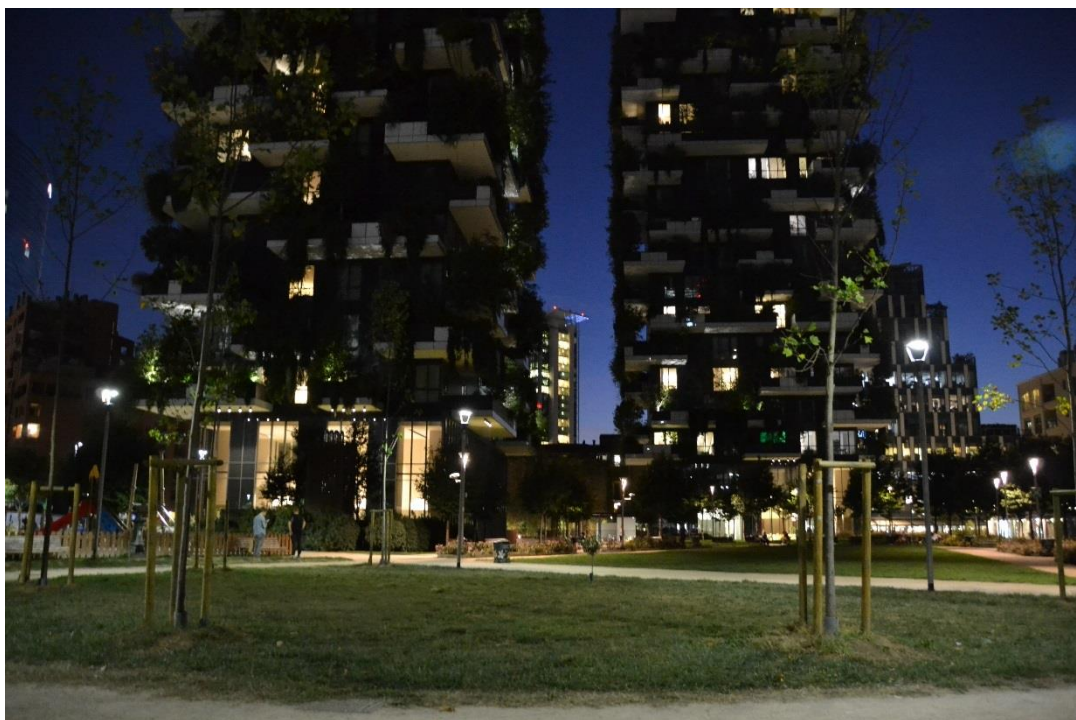
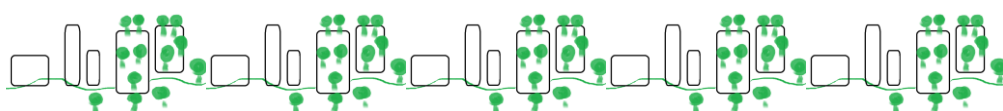


Figure 10: The *Bosco Verticale* and the *Giardino De Castillia* by night.

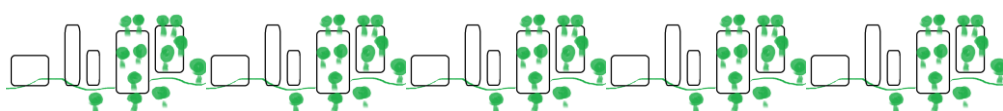


After midnight, there are still people hanging out around the fountains of *Piazza Gae Aulenti*, watched by the safety guards and military men who are present 24 hours a day. A couple of trucks are unloading as a stage for promotion activities is being built on the plaza. The tables and chairs on the terrace of *RED Feltrinelli* are still there, apparently (video) surveillance is more than sufficient. The shops around the plaza are closed, but they are equipped with video screens showing commercials. Lights are still on in some of the apartments of the *Bosco Verticale*. In the garden and the playground next to the building, there are some people smoking and drinking. There is very few traffic around but the sound from crickets can be heard. Some people pass by, as restaurant and bars in the *Via Volturno* and the popular *Via Borsieri*, Isola's night-life street, are still open.

On Saturday morning, the atmosphere changes. There is a weekly market in *Isola*, which transforms the neighbourhood in a vibrant pedestrian area, where fruit, vegetables, delicacies and household good are purchased (Figure 11). Many people walk by with shopping trolleys and shopping bags. Around noon, many people are relaxing in the *Giardino De Castillia*. The *Biblioteca Libera*, a 'free library' which consists of an outdoors book-crossing station next to the *Casa della Memoria* and the *Giardino De Castillia* offers picnic benches to rest a bit, maybe after grocery shopping. Many families visit the garden to spend some quality time together, but there are also elderly people, groups of youngsters and couples. Many stay for a while. Phone calls are often made, even on Saturdays. In these days in which it the temperature is still high and the sun is fierce, many seek out the shade. There are children in the playground and riding through the garden on scooters and bikes. Some play football, but they may be sent away by a group of elderly women whenever the ball gets too close. Throughout the garden there are also people taking photos of the *Bosco Verticale* and various foreign languages can be heard. People walk their dogs, and sometimes chat a bit with other dog owners. Many people (and some dogs) use the drinking fountain, sometimes also to wash their hands.



Figure 11: Isola's weekly market in *Via Volturno*, close to the *Bosco Verticale*.



At the crossroads of the *Passeggiata Luigi Veronelli* and *Via Gaetano de Castilia*, there is two pick-up trucks, one selling juices and *crêpes*, one selling fashion accessories. On *Piazza Gae Aulenti* many people walk by carrying shopping bags of various stores, among which Nike, Eataly, Muji, H&M, Zara, Decathlon. Between the *Unicredit Pavillon* and the Coima headquarters, one has a great view of the *Bosco Verticale* and the park 'in the making'. Late in the afternoon, some couples are seated on the stone benches, while cuddling and kissing.

Sundays are typically perfect for a little walk and a visit to *Porta Nuova*, *Isola* and the *Bosco Verticale* (Figure 12). The restaurants and shops around the *Piazza Gae Aulenti* are open, but this is only partly true for shops and bars within *Isola*. Foreign and Italian tourist visit the 'new Milan', which is slowly but surely becoming a tourist destination, although the number of tourist is still modest compared to Milan's city centre. Furthermore, people from all over Milan are to be found in the garden, being 'tourist' in their own town, as well as couples and families who live close by. Some are having an outdoor lunch or even a picnic, many are drinking from the fountains. Children are playing in the playground or playing football. A little boy screams "Gooooo! Cristiano Ronaldo! Campione del mondo!" (Figure 13) Tomorrow a new week begins.



Figure 12: Locals and tourists walking on the *Passeggiata Luigi Veronelli* on a Sunday.

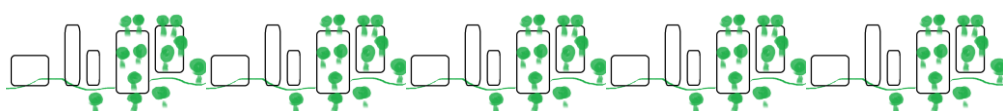
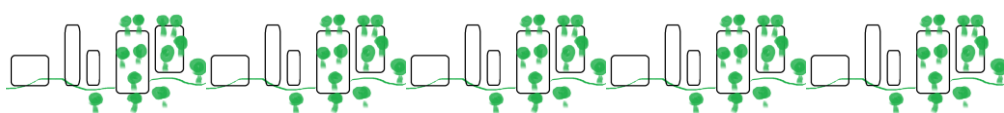




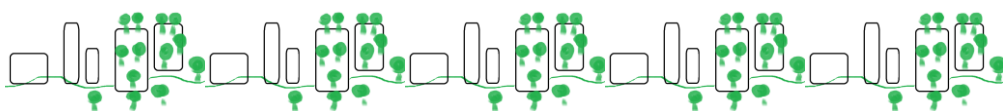
Figure 13: Children playing soccer on the grass and families in the playground in the *Giardino De Castilla*.



PART II



Empirical research



Chapter 4 – The Birth and Growth of the Bosco Verticale

In the first paragraph background and context of the *Bosco Verticale* in Milan will be traced. The lived dimensions of the *Bosco Verticale* will be elaborated upon in the second paragraph, by discussing the findings of the empirical analysis of the study. Thereupon, a conclusion concerning the lived dimensions of the building will be drawn.

The forest and its context: Story of an urban ‘island’

The two residential towers of the *Bosco Verticale*, which were completed in 2014, are located in between *Via Gaetano de Castillia* and *Via Federico Confalonieri* in Milan. The construction of the building was part of the urban restructuring project *Porta Nuova*, located north of Milan’s city centre. This large-scale project started in the early 2000s and, although it is still not been fully terminated, it has reached its final phases with the recent opening of the long-awaited *Biblioteca degli Alberi* on the 27th of October, 2018. This brand-new urban park connects the various real estate projects within the *Porta Nuova* district.

The name *Porta Nuova* means ‘New Gate’. This name seems to be ‘invented’ by the real estate developer Hines (Brizioli & Theis, 2013e; Codazzi, n.d.). Although a former station in the area was called *Porta Nuova*, the historical accuracy of the name is up for discussion (Biraghi, 2013), as *Porta Nuova* refers to two historic city gates outside the actual *Porta Nuova* district, and an adjacent pre-existing neighbourhood which is also called *Porta Nuova*. As argued by local residents, the name was most probably chosen as a metaphor to give identity to the district as a whole, referring to the ambition to transform the area into a gateway to the ‘new Milan’. An overview of *Porta Nuova* is shown in Figure 14.

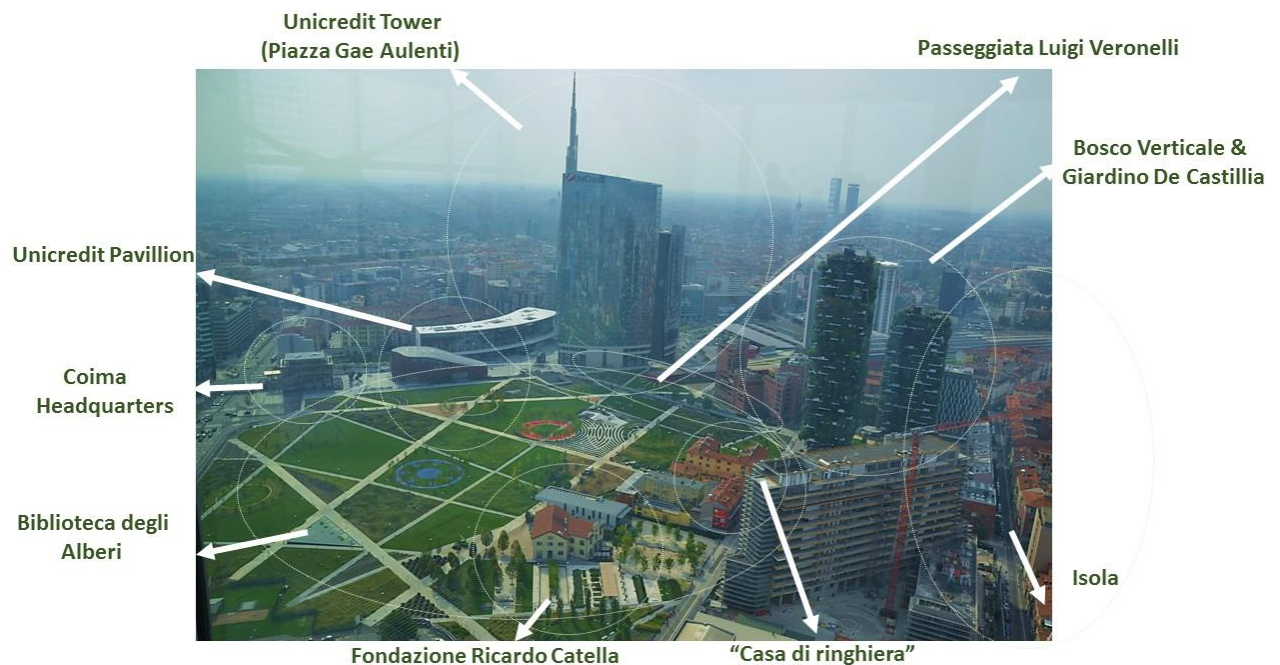
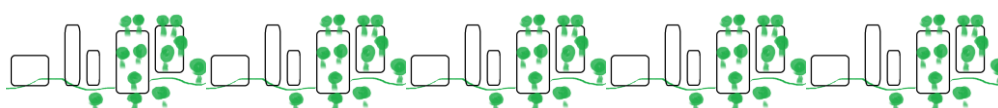


Figure 14: An overview of *Porta Nuova*, on which the *Bosco Verticale* are located on the right, and *Piazza Gae Aulenti* and Milan’s city centre are located on the left and in the middle.

Source: Author.

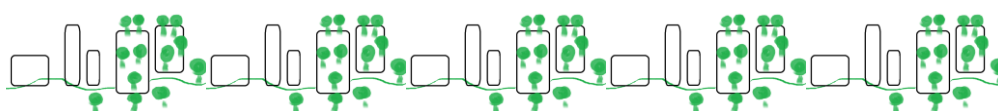


In former days the *Porta Nuova* area was referred to as the *Garibaldi-Repubblica* area. The three areas that are united in the *Porta Nuova* project include the *Porta Garibaldi* train station and its surroundings, the area of the former railway and former station called *ex-Varesine*, and the former industrial and working-class neighbourhood *Isola* (Brizioli & Theis, 2013b). *Isola* is the only pre-existing residential area. It is at the border of *Isola* where the *Bosco Verticale* has been constructed. The neighbourhood has a long and turbulent history and some (in)famous Italians have been raised here, among which Italy's former Prime Minister Silvio Berlusconi.

Isola is a former agrarian area, which was incorporated in the city of Milan in 1873. The area was industrialised in the last two decades of the nineteenth century (Brizioli, 2015). There were two large factories: the *Tecnomasio Italiano Brown Boveri (TIBB)*, an internal company producing electric machines, and the *Isaria*, in which cables were produced. Besides these two factories there were some smaller industrial buildings. They were all mainly located in the south of the neighbourhood, in *Lunetta*, a half-moon-shaped area, located around the current site of the *Bosco Verticale*. The factories would become the main employers of the local residents. The neighbourhood used to be strongly isolated from the city centre, as it was located between railways, railyards, the train station(s) and (former) canals. Hence the neighbourhood got its name, for *Isola* means 'Island'. The residents of the neighbourhood are called *isolani* in Italian to this day, which literally means 'islanders'. Only one pedestrian bridge formed the connection between *Isola* and *Corso Como*, a well-known night-life street in Milan's city centre. Thus *Isola* became a "small city within a city" (Raunig, 2013, p. 123) at the beginning of the twentieth century; in which factories and residential *palazzi* were located, as well as workshops within the inner courtyards. The *isolani* lived in a particular social environment (Raunig, 2013, pp. 123-124), in which social cohesion and traditions were preserved (Burgli, 2006).

During the two World Wars, *Isola* also became a fortress of Italian partisans, who took advantage of the neighbourhood's relative isolation from the rest of the city (Brizioli & Theis, 2013a). After the Second World War, during which *Isola* had been bombarded, Milan found itself in a state of anarchy. *Isola* entered an era of criminality, resulting in the widespread image of a no-go area, whether this was based on true facts or myths (Brizioli & Theis, 2013a). As a local resident, who arrived in *Isola* in the 1970s, explains: "When I first came here, everyone would say "Madonna, l'Isola?" (...). It was infamous".

Isola became a more or less outdated industrial area in the second half of the twentieth century, as the city of Milan kept on growing because of the economic boom (Brizioli & Theis, 2013b, p. 28). Raunig (2013, pp. 124-125) explains that such processes of de-industrialisation emerged throughout Europe, resulting in the widespread dereliction of large industrial complexes in inner city areas. As squatting was not an uncommon practice those days, many of these "partially gigantic architectures" were re-appropriated by artists and counter-cultural groups, and by doing so, these buildings were often saved from being demolished (Raunig, 2013, pp. 124-125). So did a re-appropriation of *Isola's* factories occur, as these were occupied by artist in the 1980s (Brizioli & Theis, 2013b).



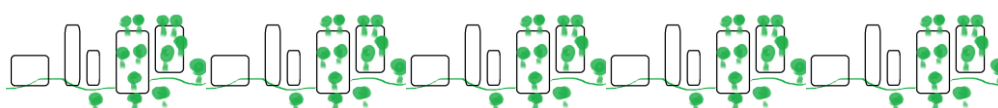
New groups arrived in *Isola* during the 1990s. At the new millennium *Isola* was no longer solely the home of workers and craftsmen, but a neighbourhood which housed students, artists and migrants too. Whoever arrived in Milan could find a home in *Isola* with little financial means. As a result, the neighbourhood became a particular microcosm within the city (Brizioli & Theis, 2013b). The new millennium, however, heralded the emerge of gentrification processes, which became ever more visible.. Caselli and Ferreri (2013) have argued that gentrification processes did not occur ‘suddenly’ of ‘naturally, contrary to common belief. Rather, the ‘sudden’ gentrification of *Isola* should be understood as the result of earlier decisions and unexecuted plans made by authorities from the 1950s onwards. Most of these earlier plans, aimed at creating a business district in and close to *Isola*, were successfully countered by local residents (Bugli, 2006; Caselli & Ferreri, 2013). As a result, *Isola* had not been affected by urban planning endeavours on a large scale, until the start of the new millennium (Bugli, 2006; Raunig, 2013, p. 129). Despite this strong resistance, these earlier plans to develop the area had made way for real estate speculation in *Isola* and the surrounding areas (Caselli & Ferreri, 2013).

Critics have stressed that *Isola* has often undergone top-down attempts to erase its socio-cultural idiosyncrasies (Bugli, 2006; Ferreri, Pesavento & Theis, 2009). The first signs of gentrification were accompanied by the authorities’ growing aspirations to open up this isolated area. *Isola* had become what Brizioli (2015) has described as a ‘paradoxical periphery’; a neighbourhood located close to the city centre, which is considered periphery by many nevertheless. The sense of urgency to fill up the “urban void” of *Isola* grew (Ferreri et al., 2009). As one of the respondents, a Milanese woman, explained, *Isola* was an “unproductive zone” from a commercial point of view; it was a “weak” area that had to be transformed into a “luxury area” to “meet the requirements of the market”.

However, in reality, a true urban void in *Isola* did not exist within the neighbourhood, as many spaces had been reclaimed by local residents in the meantime. Community gardens had been created along the *Stecca degli Artigiani*, for instance (Ferreri et al., 2009). This old factory had become more ‘permanently’ occupied by artists, craftsmen and associations in the early 2000s (Caselli & Ferreri, 2013). Within the *Stecca degli Artigiani* some occupants were officially renting space from the municipality of Milan, whereas others were squatting, in an attempt to protect the building from being demolished (Bugli, 2006).

From 2003 onwards, the Texan multinational real estate company Hines started buying land from small land owners in the area, while still remaining relatively invisible in public (Brizioli & Theis, 2013c). Together with the Italian company Coima, which is owned by the Catella family, and the *Ligresti* group, Hines had founded Hines Italia in 1999. In 2005 Hines Italia introduced the *Porta Nuova* project, a project in which the company would be involved not only as investor, but simultaneously as development and management company (Caselli & Ferreri, 2013). This would become the turning point in the redevelopment of the area, after its historic ‘impasse’ (Beltrame, 2017, p. 19). The Italian manager Manfredi Catella, whose family owns Coima, was put forward by Hines as CEO of Hines Italia and he would become the mediator of the project. Paolo, who runs a *trattoria* in front of the *Bosco Verticale* together with his wife and son, which has been there for decades, explains the well-considered approach of Hines, and Catella in particular:

He started buying, his company... it was the American group Hines and him, including Catella and Coima, they did so. Then one, two, three, four, five, six, seven... they bought all terrains. And then they developed the project. Because they did not have problems with the volumes and sizes of the constructions anymore.



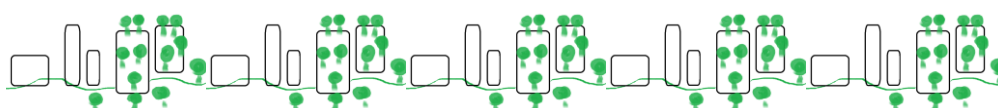
The project was subdivided by Hines into three parts: *Porta Nuova Garibaldi*, *Porta Nuova Varesine* and *Porta Nuova Isola*. In the meantime, the protest and resistance of local residents and occupants of the *Stecca degli artigiani*, was growing ever more. Not only were they opposing the demolition of the old factory, they were fighting for green space in the neighbourhood too, as well as trying to avoid that the neighbourhood would be cut into two by a large road (Bugli, 2006).

Soon Stefano Boeri was assigned by Hines as the designer of the masterplan for *Porta Nuova Isola*, after he had previously been the president of the jury in the tender for the *Giardini di Porta Nuova* (Brizioli & Theis, 2013d). The competition for these 'gardens of *Porta Nuova*', was won by the Dutch landscape architect Petra Blaisse and her studio Inside Outside, with their proposal to design the *Biblioteca degli Alberi*, the 'Library of Trees'. As Boeri was known for his progressive ideas, he did not only design the parts of the *Porta Nuova* masterplan that concerned *Isola*, he also became Catella's strategic consultant in 'coping' with the growing opposition in the neighbourhood. Together they formed the 'human' faces of the project (Brizioli & Theis, 2013d). Catella's main objective was to accelerate the project after years of stagnation, while at the same time addressing the concerns of local citizens. As Catella stated in an interview, he wanted to counter the general image of the 'malicious constructor', in order to succeed in the project (Reporting System, 2013, pp. 83-84).

At first, Boeri seemed to be an advocate of preserving the *Stecca* and the adjoining gardens (Brizioli & Theis, 2013d). Nevertheless, in the masterplan he presented in 2006 the building and the gardens had been substituted by new constructions and open spaces. The main argument given was that this decision, although taken after much deliberation, was inevitable. According to Boeri (Reporting System, 2008, pp. 38-39), preserving the factory and the gardens could not be reconciled with the idea of 'opening up' *Isola* towards the new park and the city centre. Boeri proposed a new building, dedicated to the activities that were taking place in the *Stecca degli artigiani*: the *Incubatore dell'Arte*, currently known as the *Stecca 3.0*. Boeri seemed to have succeeded in making Hines' plans for *Porta Nuova Isola* more 'likeable', for some of the associations and artists residing in the *Stecca degli artigiani* agreed to be moved to this new building. Others, however, stayed in the factory and continued opposing the *Porta Nuova* project, especially those parts of the project that concerned *Isola* (Brizioli, 2015). Boeri and Catella made some concessions to the opposition by cancelling the original plan of cutting the neighbourhood into two by a large road (Brizioli & Theis, 2013d).

Meanwhile the *Stecca* had become known in the press as the 'drug dealing fortress'. The municipality and Hines profited from this situation and tried to change the public opinion, stressing the importance of the requalification of *Isola* in the media. Despite firm opposition by artists and associations, at the time still present in the *Stecca*, the former factory was evacuated and demolished in April 2007 (Brizioli & Theis, 2013d; Ferreri et al., 2009).

Subsequently, in May 2007, Hines inaugurated the *Fondazione Riccardo Catella*. This foundation was located in a former railway warehouse and offered a small public playground in front of the building. The foundation, managed by Manfredi Catella's wife Kelly Russell, was named after Manfredi Catella's father (2013d). It was established in order to develop the area, focusing on art, activities and public spaces (Reporting System, 2008), but the venue would soon become Hines' 'propaganda center', as Brizioli and Theis (2013d) have argued.



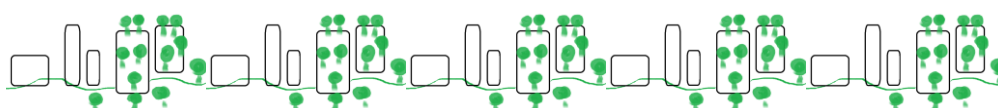
At the same time Boeri presented the much-heralded design of the *Bosco Verticale*, the vertical forests which were to be built on the rubble of the *Stecca*. To the opposition's astonishment, these two green towers were to transform the former gardens into private vertical greenery (Brizioli & Theis, 2013d). Boeri's idea may have been inspired to some extent by the greenery that was to be found on this location in former days. In any case, 'eco-sustainability' became Hines' Trojan Horse, extensively utilised by the real estate developer to justify the interventions in the neighbourhood, as Biraghi (2013) has explained. Artist Christoph Schäfer (2013) has used the concept of 'strategic embellishment' to describe the *Bosco Verticale*, criticising Boeri's design by calling it 'camouflage', used to disguise economic exclusion. Artist, among which Schäfer, created art projects to express their dissatisfaction, as shown in Figure 15, 16 and 17.



Figure 15: *Il Bosco Orizzontale*, the 'Horizontal Forest': a painting at the shutters of a local shop to mock Boeri's plans for a vertical forest.
 Source: A. Brizioli et al. (2013)



Figure 16: Christoph Schäfer's art project on a local kiosk in *Isola*, which visualised the concepts "camouflage of exclusion" and "strategic embellishment", by which the *Bosco Verticale* was criticised.
 Source: C. Schäfer (2013).



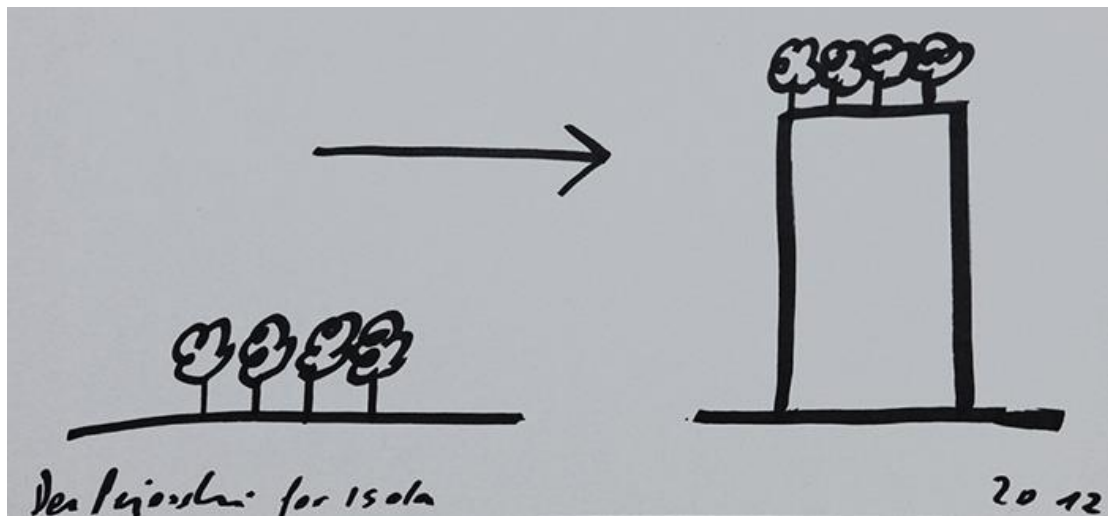


Figure 17: A sketch made by artist Dan Perjovschi, which illustrates the transformation of the community gardens into Boeri's vertical forest.

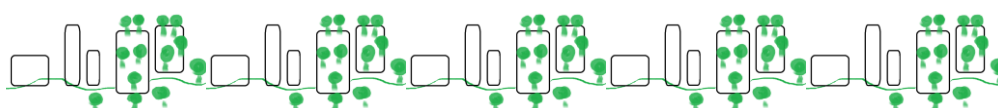
Source: A. Brizioli (2015).

Raunig (2013) has summarised the critiques by stating that the *Bosco Verticale* served as a 'green' instrument in transforming the *Isola* neighbourhood into a luxury quarter, an instrument he describes as "soft ecological propaganda". As Raunig (2013) has elucidated:

Stefan Boeri (...) took over the task of giving the project the ecological touch intended to attract the newly rich creative class. A "vertical forest", in other words a few little trees planted into the building, was to beautify one of the high-rise project and provide expensive apartments under the label eco-quarter exactly in the previously public terrain of the old parks. (p. 132)

Yet "the popular culture loves it, and it triggered more important international attempt of future urban foresting" (Bovati & Heidari Afsari, 2018, p. 183). It seems that neither the media, which were generally rather positive about the project (Brizioli & Theis, 2013e), nor Boeri conceived the *Bosco Verticale* as 'camouflage' used to disguise luxury apartments that are designated for a cosmopolitan elite. First and foremost, the *Bosco Verticale* was conceived by Boeri (2005) as a "home for trees inhabited by people" (p. 77). Boeri is aware of the fact that his *Bosco Verticale* has been the target of criticism and scepticism, as he describes his first vertical forest as a "powerful generator of critical opinions in a variety of forms, contents, and vehicles of expression" (Boeri et al., 2015, p. 65). To meet the criticism, Boeri et al. (2015) have emphasised the public benefits of Boeri's creation:

In the Vertical Forest, green is a common good which goes beyond the boundaries established by individual properties. This assumption brings together different aspects of the projects. On the one hand, the vertical development makes the flora and fauna of the Vertical Forest an integral part of the urban landscape, which everyone can enjoy. On the other hand, the connections in environmental terms that develop between the habitat of the Vertical Forest and the surrounding urban green areas help to diminish the sense of limits between "private building" and "public space". (pp. 58-59)



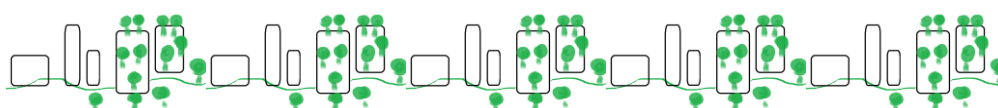
The concepts of “strategic embellishment”, used by Schäfer (2013) to criticise the *Bosco Verticale*, or “soft ecological propaganda”, as Raunig (2013, p. 130) has put it, are not so much denied by Boeri. The architect, however, turns this into the more positive concept of an “ecology billboard” (p. 111). For Boeri et al. (2011), the *Bosco Verticale* is a first step in the transformation of Milan into ‘Biomilano’, “a city which stops expanding into rural areas and choose to grow by regeneration and by increasing the presence of natural and biological spaces” (p. 3).

In 2008 it was announced that Milan would be hosting Expo 2015. The World Exposition would be an excellent opportunity to rewrite the city, by showing Milan’s latest transformations and endeavours to become a green city, with the *Bosco Verticale* as the *pièce de resistance* (Heinonen & Minkinen, 2016, p. 169). The exposition’s theme ‘Feeding the Planet, Energy for Life’ was largely focused on themes concerning sustainability and biodiversity. Therefore, it is now wonder Stefano Boeri got involved in Expo 2015 and soon became responsible for the masterplan. As many tourists were expected to visit Milan, there was a growing urgency of restyling *Isola*, before the start of Expo 2015 (Brizioli, 2015). Brizioli and Theis (2013f) have argued that *Isola* was given a makeover because of Expo, with the aim to transform the characteristic neighbourhood into a ‘little Manhattan’. In autumn 2009, the construction work of the *Bosco Verticale* was started.

In 2012 the new *Stecca 3.0* was opened, as well as the *Casa della Memoria*, the ‘House of Memory’, a building designed for associations that commemorate those who fought for freedom (Brizioli & Theis, 2013e). In 2013, local residents and part of the artists and activist of the former *Stecca degli artigiani* reappropriated a desolate terrain in *Via Guglielmo Pepe*, close to the former *Stecca* (Brizioli, 2015). They transformed it into a new self-managed community garden, in order to provide *Isola* with a ‘bottom-up’ green space.

In April 2014 the new metro station *Isola* was inaugurated. This station now connects the neighbourhood to Milan’s newest driverless metro line ‘*la Lilla*’. Caselli and Ferrari (2013) stated that the worst-case scenario for the neighbourhood’s future would be that the name *Isola* would only refer to nothing more than a metro station. Critics feared that *Isola* was soon to be invaded by gentrification and ‘swallowed up’ by the newly built *Porta Nuova*, losing its distinctive characteristics. This fear was caused by both the rapid pace in which new constructions arose at the edge of the neighbourhood and *Isola*’s increasing status as a centre of *movida*, a ‘place to be’ when it comes to nightlife and flaneuring.

In October 2014, just a year before the opening of Expo 2015, the construction of the *Bosco Verticale* was finished. The results of the research conducted by ReportingSystem (2008) show that residents of *Isola* were longing for green spaces within their neighbourhood since the construction of *Porta Nuova* had taken off. After the gardens next to the former *Stecca* had been closed, they were transformed into a construction site, leaving the neighbourhood with barely any green spaces. At the end of 2014, the public garden in front of and in between the towers of the *Bosco Verticale*, the *Giardino De Castilia*, was inaugurated (“Aprè ‘Porta Nuova Isola’, Nuove Aree Verdi e Pedonali”, 2014). Around the *Bosco Verticale*, there are small signs in the pavement indicating the boundaries between public space and the property of *Porta Nuova*’s management company.



In 2017, the garden around the *Fondazione Riccardo Catella* was opened, a well-designed and fenced private garden, designated for public use and equipped with a playground and a *bocciofila*, an area dedicated to a traditional Italian bowling game. The garden served as some sort of sneak preview of the *Biblioteca degli Alberi* which had been long in coming, until its inauguration on the 27th of October, 2018 (Figure 18). The garden was incorporated in the park, however, contrary to the park, the garden remained fenced. At the opening ceremony of the park, Manfredi Catella explained that the inauguration of the *Biblioteca degli Alberi* marked a 'symbolic' moment, for the park was designed to connect and amalgamate the different parts of *Porta Nuova* to conclude the *Porta Nuova* project (UrbanFile, 2018). The opening of the park has resulted in new routes to and from *Isola*, increasing the permeability of the neighbourhood. Besides, the park is unfenced and opened 24 hours a day, a new phenomenon in Milan which has led to a lot of controversy. At the same time the park is constantly under close surveillance (Figure 19).



Figure 18: A playground in the brand-new *Biblioteca degli Alberi*, the public parking connecting the different parts of *Porta Nuova*.

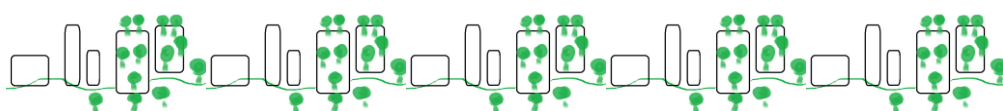
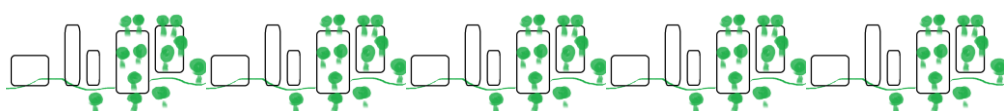




Figure 19: The *Biblioteca degli Alberi* is not fenced and opened 24 hours a day, but always under close surveillance.

Piet Oudolf, a renowned Dutch landscape designer known for his work on New York’s High Line, was involved in the design of the *Biblioteca degli Alberi*. At the inauguration of the park, Milan’s major Giuseppe Sala declared that the park was somewhat “newyorkese” (UrbanFile, 2018), referring again to the much desired ‘internationalisation’ of Milan. In 2015 the ‘internationalisation’ of *Porta Nuova* was brought to a higher level, as the entire *Porta Nuova* area was acquired by an investment fund of the Emir of Qatar (Festa, 2016). The attempts made by Hines to awaken a sense of civic pride, among the Milanese and Italians in general, by constructing *Porta Nuova* and the *Bosco Verticale*, seems to have been rather successful. When the *Bosco Verticale* was awarded the International Highrise Award, this was presented by Italian media as a true triumph of the country (Brizioli, 2015). At the inauguration of the *Biblioteca degli Alberi*, Catella stressed that the project had received international recognition, after winning the MIPIM award for ‘Best Urban Regeneration Project’ (MIPIM Awards, 2018). In the words of Catella, the international recognition for his *Porta Nuova* project shows that “Italians can finally make it happen” (UrbanFile, 2018).



“It is our skyscraper”: Lived dimensions of the Bosco Verticale

For us it is special. It is beautiful. We, we don't have any idea of what is inside, because we have never been inside. But from the outside, you can see it too, it's stupendous!

The *Giardino De Castillia*, four years after its inauguration, has become a meeting place for some of the elderly people in the neighbourhood. Some of the elderly women are accompanied by their foreign home helps. One of these elderly women, who is originally from the south of Italy but arrived in *Isola* in the 1970s, has described her impression of the *Bosco Verticale* in the introductory quote. She explained that even though she can see the *Bosco Verticale* from her window, she still insists on going to the *Giardino De Castillia* to experience the building from close quarters. As argued by Heinonen & Minkkimen (2016), the two towers indeed seem to “invite pedestrians and cyclist to come close” (p. 169).

Firing the imagination: Celebs in a haunted house

First and foremost, the *Bosco Verticale* captures the imagination of its spectators, even if the building is not publicly accessible. Sara sells fashion accessories from a colourful *Ape*, a typical Italian pick-up truck, in front of the *Bosco Verticale*, up to three times a week. She illustrated that the building is the talking point of people passing by: “hearing the comments is funny (...) We are all architects and everyone feels free to discuss it... interpret, discuss”.

Not only do many tourists and *Milanese* from other parts of the city immediately start discussing the building when approaching it, the *isolani* themselves give their thoughts free rein when it comes to the building, perhaps because many “don't have any idea of what is inside”, as argued by the elderly woman. Many elderly respondents wonder whether there will be any daylight in the apartments, as they expect the trees and plants to block sunlight. They are intrigued by the fact that the residents are not supposed to and even not allowed to take care of the plants and trees, for gardening is done by professionals. Some are triggered by the common rooms and services, such as the gym and the shared ‘party kitchen’.

What seems to capture the imagination of the Milanese most, however, are the residents of the city's vertical forest. Many “*personaggi famosi*”, celebrities, are believed to live in one of the apartments. Although exact names are not often given, football players, singers and “the daughter of Trussardi” have been indicated. Some respondents also remarked that there are very few Italians living in the apartment, let alone people who are originally from Milan. Such perceptions of the building are both created and confirmed by the press, for instance in the recent MTV programme *Ricanza*, in which the arrival of a 21-year old ‘rich boy’ in his new apartment in the *Bosco Verticale* was broadcast, or an article in the *Corriere della Sera* (Andreis, 2016), in which it is stated that football players and rappers are living in the *Bosco Verticale*. The articles also mention that four out of ten residents is foreign, whereas the Italians who live in the building are frequently moving around the world.

Some myths concerning the *Bosco Verticale* are reinforced by the highly surveilled entrances and lack of interaction between the street and the ground floors of the towers, which tour guide Inge has described as an “anonymous space”. In fact, the direct spaces surrounding the towers are private property and this is even indicated by small signs on the pavements (Figure 20). At daytime one cannot easily tell what is going on inside the central hallways. Tourists may not even think about what is behind the green walls, as tourist guide Inge described. Some even think the *Bosco Verticale* is an office building, as street vendor Sara pointed out. However, contrary to tourists, the *isolani* do seem to be intrigued by the mysteries of “their” vertical forest.

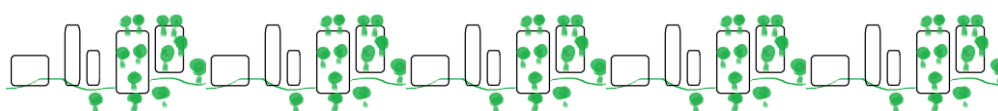
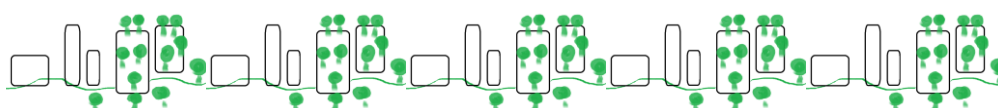




Figure 20 A sign on the pavements around the *Bosco Verticale* indicated which parts are public and which parts are private property.

Although the observations have revealed that there are most certainly residents entering and leaving the towers, the building is not lived in that way by local residents and people visiting the garden. “You never see anyone, nor entering, nor leaving”, as one respondent explained. Many respondents wonder why the occupants of the *Bosco Verticale* do not seem to use their balconies. The observations conducted in this study confirmed that there are indeed no people on the balconies, at least not clearly visible from the streets or the *Giardino De Castillia*. This ‘shady’ behavior of the building’s residents reinforces the *Bosco Verticale*’s local image of a ‘haunted house’. Such perceptions create a sense of distance; the urban public cannot relate to the residents of the *Bosco Verticale*, given that many have never seen nor interacted with these residents.

Many respondents stated that the *Bosco Verticale* transmits an ambiguous message in their view. On the one hand, its architecture is perceived as beautiful and astonishing. On the other hand, it is considered a symbol of the divide between the haves and the have-nots, “a pyramid in the confrontation with others”, as local historian Sergio has put it. This green ‘pyramid’ is reminding those who see it of the “economic differences” between people. The respondents’ main critical remarks concerned the fact that the *Bosco Verticale* is a home “for the elite”. As Sergio has described: “It is not something for everyone. It is something for the elite. And the elite has their flaws, from a human point of view... it is bad.” This results in negative feelings towards the building’s interior, since most of the people encountering the building in their daily lives are well aware of that the apartments are not affordable for them. Nevertheless, their perceptions and experiences of the vertical forest’ exterior are considerably positive.



Living outdoors: Nature in the city

Despite not being allowed to enter the building and their general perception of 'economic exclusion' from its luxury apartments, many respondents do seem to appreciate the building and relate to it, at least to its green façades. The respondents acknowledged that, contrary to the building's interior, the exterior of the building can be enjoyed by all city dwellers, in line with Boeri's (2015) conception of the building's green as a "common good" (p. 55). A local elderly couple stressed that they have seen the building being constructed "from the first stone", which they described as a true "spectacle". In this sense, the respondents seem to confirm the claim made by Gobster and Westphal (2004) that people can care much for nature in their surroundings.

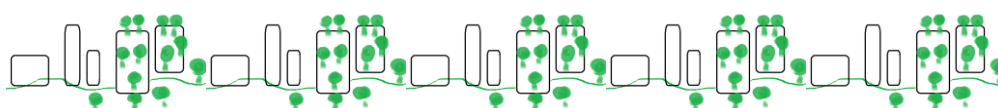
A woman who lives elsewhere in Milan, however, also mentioned that right after its construction the building was "rather ugly". Now the trees and plants are full-grown, the beauty of the *Bosco Verticale* is no longer a matter of dispute for any of the respondents. The building has been called a "masterpiece", a "paradise" and an "oasis in the desert". Tour guide and architect Inge has stressed out that, contrary to most contemporary architecture designed by 'starchitects', green simply "appeals to all". Local 'historian' Sergio has confirmed this:

Because one cannot say it is not beautiful. (...) Despite the fact that it has been executed to make a profit, let's say, with people who... who did it to make a profit, to make a profit, despite that... we have gotten over it a little, because they left us something beautiful.

According to the local residents, the building reaches its peak of splendour during spring. As street vendor Sara described the comments by passers-by throughout the year:

It is very beautiful for example in fall and in spring, of course if you come in winter, the plants are bare, like all plants in the world. And here obviously it is less... aesthetically, the green parts, you don't see them. Which is why from November to February the comments are not too nice. However, it should just be understood that, being green plants, they... they follow the rhythms of nature, not those of the building.

Boeri's conception of the *Bosco Verticale* as an ever-changing landmark, which follows the seasons, seems to be lived in that way too. Furthermore, according to a local resident who has lived over eighty years in the neighbourhood, the *Bosco Verticale* and the *Giardino De Castillia* have had a pleasant spin-off, for they have introduced the idea of "living outdoors". According to this respondent, this was an uncommon phenomenon in Milan until recently. After years of waiting, during which the local residents were longing for new green spaces in their neighbourhood, as can be concluded from the research by Reporting System (2008), the *Bosco Verticale* has finally brought nature to *Isola*. As one local resident describes: "I like the idea of having it close by, full of nature". The building shows that "modernity does not only mean cement" and that nature can be incorporated while constructing "in an urban context", according to the respondents. The garden, however small, is widely appreciated by the local residents and visitors. A couple who often repose on one of the benches after a walk in *Corso Como* and *Porta Nuova* with their baby child, points out that the garden is clean, tidy and well-maintained, which is not the case for all parks and gardens in the city.



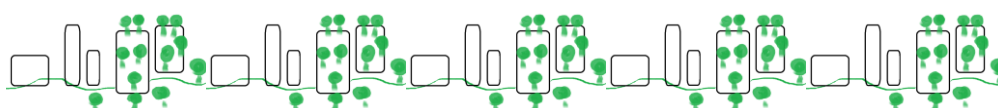
The green escape

The observations have revealed that the public spaces around the *Bosco Verticale*, especially the *Giardino De Castillia* and benches in and around the *Biblioteca degli Alberi*, are also a 'place for romance'. It is not uncommon to find (young) couples sitting on the streets or on the benches, chatting, passionately kissing and cuddling, in the afternoon and the evening (Figure 21). Yet 'romantic' is not a characteristic of the building mentioned by the respondents, nor is public display of affection uncommon in Milan's public spaces, especially parks. Nevertheless, such usage of the garden and the park may indicate that being around the *Bosco Verticale* has a particular 'feel'. The *Bosco Verticale* and the green urban landscape it is part of, appear to be considered a romantic site within Milan's cityscape.



Figure 21: Romance at the foot of the *Bosco Verticale* and the others side of the *Biblioteca degli Alberi*.

Some of the interviewees indicated that the *Bosco Verticale* and the *Giardino De Castillia* offer the possibility to be 'outside the city', if only for a little while. These statements may be related to the usage of the garden for 'romance' too. Besides, some interviewees described that looking at the green façades of the *Bosco Verticale* is relaxing and calming. One of the foreign home helps stated that the *Bosco Verticale* "allows being on one's own for a moment", almost like being in a 'real' forest. She mentioned that the *Bosco Verticale* "is something that brings you peace" and "gives you some sense of tranquility". Besides, the building was associated with "light", "(clean) air" and "breathing" by several respondents. The claim that nature can be "inspiring, awesome, tranquil, or calming", made by Kaplan and Kaplan (1989, p. 175), may also be applicable to vertical forests. In this sense, the *Bosco Verticale* and the *Giardino de Castillia* are being experienced as a "restorative environment" (p. 175), for respondents have indicated a 'sense of being away', a particular fascination for the building and an 'expanding' scenery. The little amount of critical remarks among the respondents concerning the buildings' current aesthetic qualities seems to confirm human preferences for green buildings, in line with the findings of White and Gatersleben (2011).



Belonging & nostalgia: A green meeting place

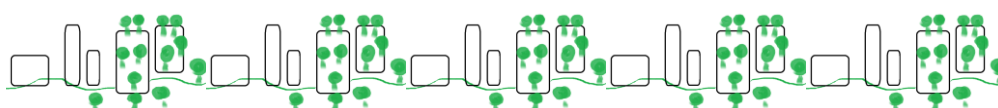
Overall, the *isolani* who were interviewed are rather positive about the changes that recently have taken place in their neighbourhood. There is some sense of nostalgia, however, especially among the older people. On the Facebook group *C'era una volta... all'Isola... e dintorni* (Once upon a time in Isola and surroundings) a recent post of a photo of the *Bosco Verticale* caused a commotion. People call the building “a monster”, and part of ‘an *Isola*’ they do not like. The group discussion, however, ends when many agree that such comments are only expressions of “nostalgia” whereas the “spirit” of *Isola* will never change. A similar conclusion can be drawn from the interview with restaurant owner Paolo, as he explains: “Yes, there have been many [changes]. Perhaps... On the one hand it has been nice, on the other.... there is a little nostalgia. But it has to be accepted”.

Considering both the strong opposition in the neighbourhood before and during the construction of *Porta Nuova* and the criticisms expressed by advocates of preserving the *Stecca* (e.g. Brizioli (2015); Caselli and Ferreri (2013); Ferreri et al. (2009); Schäfer (2013) and Raunig (2013), among others), it could be expected that *Isola*'s inhabitants still harbour a grudge against the *Bosco Verticale* and its developers. A tentative conclusion on the basis of the interviews is that the opposite seems to be true. The *isolani*, or at least a significant part of the inhabitants, seem to have overcome the ‘trauma’ caused by the demolition of the *Stecca*. As street vendor Sara explains:

No, no. There were some barricades, by the guys from the *Stecca*, in order to prevent its demolition. But then, you know, if the municipality decides, it is not that these guys... in sum. However, yes, the *Stecca*. (...) Certainly, perhaps they made a request once, twice, three times, the fourth time they went inside and kicked out everything.... from one moment to another. However, I don't remember it as a bad thing in Milan. See, I don't have this memory.

These rather positive perceptions are shared by one of the elderly women, who argued “yes, the factory... so... later on, they demolished it and they gave us this beautiful garden. Beautiful (...). I'm very glad they did this.” Sara also had an explanation for the sudden disappearance of critique among local residents a few years after the building's completion: “But there's the Italian culture of ‘it used to be better’. Let's complain a bit!”. This ‘culture of complaining’ is also mentioned by other respondents. Furthermore, concerning the recent opening of the *Biblioteca degli Alberi* all respondents at least express some concerns.

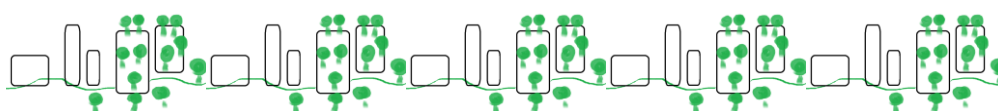
Restaurant owner Paolo, who has also been a volunteer in the community gardens that used to be located at the current site of the *Bosco Verticale*, is now satisfied with the *Giardino De Castillia*, which is a ‘substitute’ for the former gardens: “Later they redid it their way. They did well. (...) During the day here there are the children, and over there all the seniors. It is really local.” Paolo also stated that those visiting the garden of the *Fondazione Riccardo Catella* these days are predominantly ‘snobs’, often mothers with children who are ‘from outside the neighbourhood’, whereas the ‘true’ *isolani* will go to the *Giardino De Castillia*, at the foot of the *Bosco Verticale*.



The observations have revealed that the *Giardino De Castillia* indeed seems to offer a green space to local families, judging by the amount of adults accompanied by children and baby prams. Based on the observations, it can be argued that the *Bosco Verticale* and the *Giardino De Castillia* have become a frequently visited green space, in which parents can play with their children, or relax and chitchat with other parents. This also seems to apply to many grandparents, who accompany their grandchildren to the garden after school. Many people are walking their dogs in the garden, and they often have a chat when passing another dog owner. The garden is a green space in which different generations mingle. Besides, it is a green space in which local residents, businesspeople and tourist are present. Sometimes one of these groups dominates, but during certain times of the day there are all present simultaneously, for instance around lunchtime. The observations also revealed that people tend to sit down on empty benches, but if all are occupied, they will sit down next to strangers, sometimes starting a conversation. Therefore, it can be argued the *Giardino De Castillia* is a green meeting place, in which the *Bosco Verticale* is an important reference point.

One of the respondents, who works in the area, stated that there is a “sense of belonging” in the *Giardino De Castillia*. After the completion of the *Bosco Verticale*, the surrounding public spaces were still perceived as “empty” by local residents. Some then proposed the authorities their idea of creating the *Biblioteca Libera*, a book-crossing station next to the *Giardino de Castillia*, as a local resident and volunteer of the *Biblioteca Libera* has explained. This initiative shows local residents have tried to re-appropriate the ‘sterile’ public spaces created in their neighbourhood, which may have contributed to their sense of belonging. The ‘free library’ is equipped with some picnic benches. According to the volunteer this grassroots initiative is used as a “resting place” as the observations seem to confirm his. The benches are not only used for reading, but are also a place where groups of youngsters are hanging out, especially in the evening and in the night-time. This sometimes leads to conflicts, for empty bottles and other litter is left behind, to the annoyance of the people present in these public spaces the day after. Concerns have been expressed in regards to the *Biblitoca degli Alberi*, as the park is not fenced and opened 24 hours a day. Restaurant owner Paolo expected the new park to attract young people hanging out at night, drinking or even dealing drugs. According to Paolo, such nuisance is already happening *Giardino De Castillia* at night, which he describes as a “mess” at night. Such perceptions show the local residents sometimes feel their neighbourhood is being invaded by strangers and undesired spatial practices.

Nevertheless, the *Bosco Verticale* has given the *isolani* a sense of pride; as the local baker in *Via Volturmo* has explained: “It is our skyscraper (...), it is ours”. The elderly woman visiting the garden almost every day explains that the building has become a landmark within the neighbourhood: “we, from where we are, from up here, or from down there, we always see our *Bosco Verticale*”. All respondents seem to know the name of the building and quite some of them are familiar with the architect Stefano Boeri. From this perspective, the *Bosco Verticale* seems to be a good example of the claim made by PPS (2016, pp. 31-32) that greenery contributes to the unique identity of a place and may encourage people to reflect on the place’s particular features. One respondent, who works close to the *Porta Garibaldi* station and frequents the *Bosco Verticale* from time to time during the weekend, even stated that in the surroundings of the *Bosco Verticale* “one can be part of the context”; a particular context which is a combination of both “nature” and “modernity”.

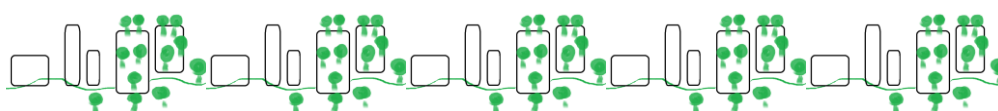


“There is something about Isola”

As Sergio, born and raised in *Isola*, argued: “So there is something about Isola, it is different... different from the rest”. *Isola* seems to have kept its unique identity hitherto, even though it may be witnessing gentrification processes more intensely than ever, for many Milanese are discovering this ‘hidden’ part of town more and more. As one elderly man, who lives in the heart of *Isola*, argued “here it has become a centre now”. The local baker, however, stressed that “the people have stayed the same” and *Isola* is still far from losing its character. Rather, as street vendor Sara explains, “it is an area that has kept its own character, to which novelties have been added”. Two of the *case di ringhiera*, traditional Milanese apartments with a shared open gallery around an inner courtyard, have been preserved in the *Via Gaetano de Castillia*, and one of these buildings is a national monument. As they are located in a street that used to be filled with similar buildings, they are much appreciated by both the *isolani* and people visiting the area, for the contrast they are providing. According to a respondent, by these contrast “stories” about the ‘old’ and the ‘new’ are being told.

The respondents often refer to the redeveloped parts of the neighbourhood as a “luxury area”. This indicates that they are aware of the processes of eco-gentrification going on in the area. An elderly man mentioned that the *Porta Nuova* project “has brought life, but we pay for this in the form of nuisance”. Yet he added that in his opinion the benefits do outweigh the disadvantages. For example, many *isolani* profit from the new pedestrian walkway to *Corso Como*, for now they can have an enjoyable walk from their homes into the city centre. As there are very few cars in *Porta Nuova*, the number of people cycling has risen considerably. Although there are still some strong sentiments of nostalgia within the neighbourhood, in a more practical sense the local residents do not seem to regret that their neighbourhood has ‘opened up’ towards the city. An elderly woman stated that she is glad the area has undergone these transformations, even if the design of the *Bosco Verticale* is rather insignificant in her opinion.

However, some critical remarks have also been made by the respondents. For those who have lived for years or even decades in *Isola* its transformation into a gentrifying neighbourhood, a nightlife zone, as well as a space for conspicuous consumption, is hard to conciliate with their images of *Isola* in former days. As restaurant owner Paolo describes: “This used to be a unique village”. The long-term resident expressed their amazement about the number of tourists that are visiting their neighbourhood and the *Porta Nuova* area, both foreign and Italians, who are making photos and videos of the *Bosco Verticale*. As an elderly local resident has put it: “It is strange. It used to be a meadow”. Street vendor and local resident Sara has explained that the *isolani* have become accustomed to the presence of the *Bosco Verticale*, which is liked more by foreigners. The observations have also shown that tourists seem to pay much more attention to the building than locals. Nevertheless, even local people can be found discussing and pointing at the building, while passing by or spending time in the *Giardino De Castillia*. Yet seeing a large group of tourists accompanied by a tour guide, sometimes on bicycles, is what seems to strike the local residents most. Nevertheless, as tour guide Inge has argued, this is still no mass tourism in the area, especially not when compared to Milan’s city centre. Although the *Bosco Verticale* and its conspicuous appearance does attract tourists and passers-by from *Piazza Gae Aulenti* to the borders of *Isola*, for many do not go further than *Via Gaetano de Castillia*. As Inge has explained *Isola* is an interesting neighbourhood to visit, but one has to know what it has to offer beforehand. The observations have confirmed that there are many tourists passing by, but only some of them enter the *Giardino De Castillia* or walk even further into the neighbourhood.



Another outcome of the gentrification processes in the neighbourhood perceived by the locals are the housing prices, which have risen exorbitantly, and the influx of wealthy residents. As Paolo has argued “The development of the neighbourhood is to blame. Everyone wants to come and live here in these old houses”. However, notions of displacement of long-term residents have not been made by the respondents, in line with the local baker’s statement that the “people have stayed the same”. He also mentioned that, from a commercial point of view, it is positive that nowadays the *Milanese* seem to have discovered the neighbourhood.

Although the outcomes of eco-gentrification seem to amaze the *isolani*, the data gathered reveal that many of these outcomes are experienced as positive, which may slightly change their perceptions of the transformation of the neighbourhood. In Italy, owner-occupancy is relatively high and this seems to soften gentrification processes (Caselli & Ferreri, 2013). Thus, many local residents, who in former days opposed the changes within their neighbourhood, are pleased by the neighbourhood’s metamorphosis after all. This is explained by restaurant owner Paolo:

Their home’s value has increased by 350 percent, they are happy. Before they were not happy. They were afraid. (...) Now they are happy, because if you are selling a home in *Isola* it may take a week and you have already sold it.

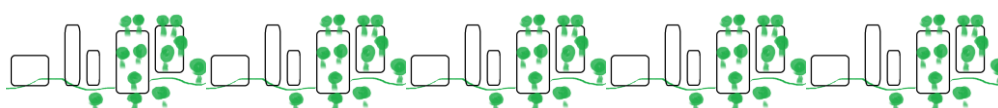
Internationalising Italy

The ‘other parts’ of the *Porta Nuova* project, located a little further away from *Isola*, in particular *Piazza Gae Aulenti* and the *Unicredit Tower* as well as the *ex-Varesine* area, are experienced as more alienating, when compared to the *Bosco Verticale* and the adjacent garden. Sergio was born and raised in *Isola* and writes about the history of the neighbourhood even after moving to the suburbs. He emphasises that the *Bosco Verticale* is located in *Isola* and not in ‘a *Porta Nuova* district’, a name he cannot relate to:

Because *Porta Nuova*, I will say it right away, because I insist and I do not want it to be called *Porta Nuova*, because the first mediaeval *Porta Nuova* is in *Via Manzoni*. (...) All those who do guided tours, they come to *Isola* and they do guided tours... and they all say “*Porta Nuova*”. No, it is wrong! It’s wrong! One day I will fight with someone, because it is not right.

The parts of the *Porta Nuova* project that are not *Isola*, have not only been compared to New York, as described earlier, but also to Dubai and Berlin. According to a respondent, who visits the area in the weekends, *Porta Nuova* “has internationalised Milan”. An inhabitant of *Isola* would go as far as stating that “this has become an area that brings Milan closer to the great cities of Europe”. A Milanese woman visiting the *Biblioteca degli Alberi* revealed that she initially had doubts about *Porta Nuova*: “At first, I was sceptical about the new skyscrapers in Milan, I thought they were not necessary”. She added that now the skyscrapers are there, her opinion has radically changed.

Although tastes differ, many respondents seem to have difficulties reconciling such an ‘internationalised area’ with their own image of Italy. This seems to be due to the country’s architectural culture, in which constructing within or close to city centres is often out of the question, as street vendor Sara stressed out. Italian cities are relatively small and capital city Rome simply remains ‘untouched’. One respondent hinted that a project like *Porta Nuova* could only be realised in Milan: “I tell you, Milan is Italy’s only metropolis”.



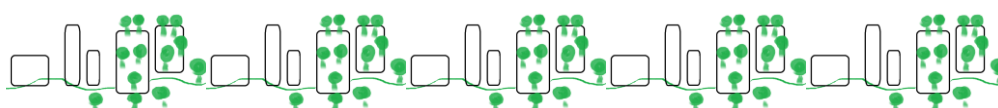
Many respondents thus seem to agree to a certain degree with Brizioli's (2015) criticism that the image of the *Porta Nuova* district can only be successful when pretending it is an area that did not pre-exist. Despite the (initial) strangeness and the sense of nostalgia, many respondents tended to emphasise the urgency of new constructions like *Porta Nuova* and the socio-economic progress that is associated with such spatial interventions. The need for transformation in the area, as much as it has been felt by the local authorities and real estate developers, was felt too by the *isolani*, despite their nostalgic feelings. Nonetheless, for some of the *isolani* born and raised in the neighbourhood, the 'internationalisation' of the area has gone over the top. Sergio, while referring to the Emir of Qatar's investments in the area, explains:

The fact is that, Isola not being Italy anymore, it pisses me off. That is to say, I was proud of the old Isola because it was natural, I was born there, it is natural. I am really proud of the present Isola, because they made something beautiful.... But almost illegally, because Catella... is gone. He took the two billion (...) Because the Italian government, with the war we have against ISIS, cannot have an ISIS neighbourhood in Milan. Come on! Come on guys, come on! Come on, that is impossible!

An idea of the future?

When asked whether the *Bosco Verticale* may represent a foretaste of the city of the future, the respondents often expressed their hope that this would be the case. The building has been called "an idea of the future", "innovative", "modern", and "a nice experiment". These are attributes that refer to a futuristic building, as explained by Heinonen and Minkkinen (2016). Some respondents argued that the building also creates a sense of "awareness" concerning sustainability within cities, which indicates that Boeri's mission is being recognized by the urban public. In this perspective, the building has become a "material form to dreams for an alternative future" (Kaika, 2011, p. 989).

Yet, the *Bosco Verticale* cannot be considered an example of the revival of architecture as 'social art'. Many respondents argue that the alternative future being projected by the *Bosco Verticale* is only appealing if in the future there will be vertical forests "for all", and not only for "rich people". The costs of constructing vertical forests are therefore considered a decisive factor in the question whether there will be constructed more green buildings in the future. Besides, there are some concerns among the respondents about the future maintenance of both the *Bosco Verticale* and its surrounding public spaces. As Sergio explains, "if we do not continue to take care of it, to maintain it to keep it like this, what kind of cathedral in the desert would come out? There is still this possibility too, right?".

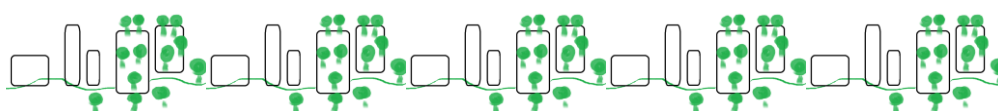


Unravelling the vertical forest: Lived experiences of the Bosco Verticale

The *Bosco Verticale* in Milan has altered the everyday experiences of local residents and the people encountering the building in their daily lives. The building is the product of an intricate construction process. This process has been dominated by real estate developers, investors, architects and local authorities. At the same time, the plans proposed by those dominating the process have been contested by local residents, partly successfully. Despite earlier contestation and criticisms, the *Bosco Verticale*, around five years after its completion, has become a living building widely appreciated by locals, for its green appearance. Furthermore, the *Giardino De Castillia* has become an important and robust meeting place for the *isolani*, which offers them a welcoming and much desired green escape within their neighbourhood, despite some concerns and amazement on the 'invasion' of the neighbourhood.

Even though there is a strong sense of nostalgia within *Isola*, among elderly residents in particular, the exterior *Bosco Verticale* is now warmly embraced by many. This may be explained by the fact that the *Bosco Verticale* and the surrounding green spaces are experienced as a "restorative environment" (Kaplan & Kaplan, 1989, p. 175). However, the interior and the residents of the *Bosco Verticale* also represents a 'home for the elite', which many locals cannot relate to. Nevertheless, the building and its myths also strongly seem to fire their imagination.

Despite ongoing (eco-)gentrifications in *Isola*, the idiosyncrasies of this historical neighbourhood have not (yet) been faded out by the rather invasive urban regeneration project of the *Porta Nuova* district. Rather, the *Bosco Verticale* seems to have reinforced a sense of belonging in the neighbourhood. Local residents have difficulties in relating to the internationalised area of *Porta Nuova*, but do strongly seem to care about 'their' green skyscraper.



Chapter 5 – Building the Dutch green city

“Someone stop Stefano Boeri: The father of the Bosco Verticale has hit the mark again and was granted the realization of a new green skyscraper in Utrecht, the Netherlands.” (Biaggi, 2017)

“The first Bosco Verticale at affordable prices is arriving. The Trudo Vertical Forest in Eindhoven shows a green building for all is possible.” (Seghetti, 2018)

Both introductory quotes from Italian media illustrate the press’ reaction on the global expansion of Boeri’s concept of the vertical forest, which has recently reached the Netherlands. In their attempts to become (visible) green cities, the vertical forest seems to be a tempting concept for the Dutch cities of Utrecht and Eindhoven. Boeri is copying his own design, which has become a ‘product’, and starting to design *Bosco Verticale* lookalikes on a global scale. Meanwhile his ideas are also replicated by architects designing green, ‘living’ building on an even larger scale.

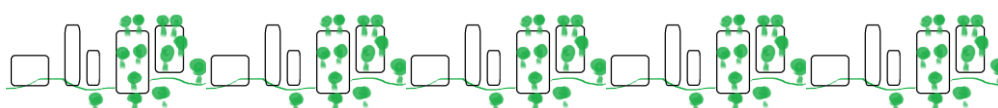
Many of the ‘spatial professionals’ that were interviewed confirmed that the green city discourse is becoming ever more manifest. According to the respondents, from the economic crisis onwards, local authorities seem to have gained more awareness of the urgency to adapt the physical environment to (future) climate change, in order to become ‘resilient’ cities. As a consequence, the so-called “green-blue” elements are incorporated into construction project on a large scale these days. Greenery, including green façades and rooftops, is no longer considered to be solely “a nice gadget”, but rather a true solution for problems caused by climate change, as a green building expert has argued.

Wonderwoods: Utrecht’s green cathedral

The Dutch city of Utrecht, known for its progressive attitude concerning sustainability, issued a tender for the city’s ‘Healthy Urban Quarter’ in 2016. This plot is a pilot project of the future redevelopment of the *Beurskwartier*, which is currently a large parking area used by the *Jaarbeurs*, one of the major conference and exhibition centres in the Netherlands. The area is located next to the country’s most important public transport hub *Utrecht Centraal*, and close to the historic city centre. The inauguration of the *Moreelsebrug* in 2016, a passageway for pedestrians and cyclist which connects the city centre to the future *Beurskwartier*, marked the first milestone in incorporating this former semi-periphery into the city centre.

In 2015 the City of Utrecht introduced ‘healthy urban living’ as the key concept for the future *Beurskwartier* in a vision paper. This concept is referring to a green, sustainable, livable and innovative city, and the document describes the guidelines for future development of the entire *Beurskwartier* area. A plot along *Croeselaan*, located opposite the theatre *Beatrixtheater* and the *Kinepolis Jaarbeurs* cinema, was chosen as a pilot project, as the project manager of the City of Utrecht explained:

But that one [the vision paper] was still in the making, and then the plot actually appeared (...). Hey, we can develop this, we can do this now already... We can already challenge the market when it comes to those themes, we can run a pilot.

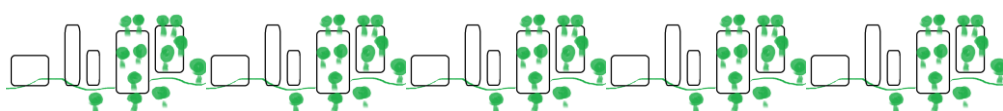


The project was named 'Healthy Urban Quarter' as the City of Utrecht wanted to start making 'healthy urban living' part of its "DNA" as soon as possible, as the project manager has put it. The tender was announced in both Dutch and English, as local authorities were aiming for international attention: "That is what we want too in Utrecht, we want to put ourselves on the map". The website of the tender (<http://huqutrecht.nl/>) showed only two reference images of green architecture: both photos of the *Bosco Verticale*. As the project manager of *Stationsgebied*, Utrecht Station Area, elucidates: "Then you will also receive those [images of the *Bosco Verticale*]. (...) Market players, they know all too well where those images come from". Therefore, it is no wonder a team of real estate developer G&S Vastgoed, which had visited the *Bosco Verticale* with Stefano Boeri as their tour guide just before the tender was announced, decided to approach Stefano Boeri Architetti and MVSA Architects. G&S Vastgoed developed the proposal *Wonderwoods*, "some sort of paragon of healthy urban living", as the project developer has described it (Figure XX).



Figure xx: The two towers of *Wonderwoods*: on the left the tower designed by *MVSA Architects*, on the right the tower designed by *Stefano Boeri Architetti*.
Source: a.s.r. real estate (2018).

The key principles of *Wonderwoods* are bringing back nature into the city and creating a healthy urban environment. Those involved in the project have mentioned the "overall concept" and "Wonderwoods theme", which they consider to be well-thought out: "Everything had to be healthy, of course", as the architect of MVSA has argued. The knowledge of Stefano Boeri Architetti was used at an early stage and 'healthy urban living' was incorporated into the very details of the proposal, including healthy retail concepts, sports' facilities and sustainable transportation. To create a 'human scale' the plot was divided into two connected towers: a vertical forest to be designed by Stefano Boeri Architetti and a green but more transparent tower to be designed by MVSA Architects. As the project developer of G&S Vastgoed underlines: "And that was also one of the things we really scored points at, because of Boeri of course, but also just the fact that we did two truly, two truly distinct buildings... each with their own character."



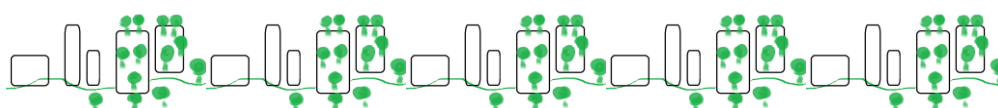
As can be read on the website of the tender, the objective of the tender was “an attractive ‘green’, iconic building that stands out and is as recognizable as the cathedral” (Stationsgebied Utrecht, 2016). The project manager confirms that the local authorities aimed at creating a “landmark at the western edge of town”, which can ‘compete’ with the historic Dom Tower that remains the city’s traditional landmark on the east side. In June 2017, G&S Vastgoed and KondorWessels Projecten won the contract with their proposal *Wonderwoods*, by which they aimed to develop a “paragon of healthy urban living”, as the project developer of G&S Vastgoed explained. The proposal included 300 apartments, 27,000 m² GFA, parking, as well as spaces for offices, ‘healthy’ retail and sports’ facilities (G&S Vastgoed & KondorWessels Projecten, 2017). The apartments will be available for mid-market rents and are partly designated for people working in the public sector. The building will also include a so-called ‘Education Hub’, in which visitors will be able to learn all about vertical forests and the benefits provided by this new building typology. Besides, a ‘Playlab’ is planned to be located in the building, a unique art and science museum. The building will also be equipped with large rooftop garden which will form a “continuing park” at around 25 metres high, which forms a route across the two towers. This elevated park will be publicly accessible from a rooftop restaurant.

Due to its strategic location close to the major transport hub of the Netherlands and one of the country’s most crowded places, the Healthy Urban Quarter is considered “the best place to make a statement” and *Wonderwoods* is a “grand gesture”, in the words of the professionals. As a green building consultant elucidates:

I do believe, I truly believe that a statement is being made with the building... and that it is an inspiration for many new constructions, or for a different view on... public spaces. Not only in Utrecht, but it will expand. I truly believe as well, and you can see this in Milan too, it attracts crowds. People want to see it. And that is going to happen in Utrecht too. I think that, that it is one of the most iconic buildings that will be constructed within the next five years.

The strategic location made *Wonderwoods* an interesting investment opportunity for a.s.r. real estate, as argued by the acquisition manager. Two of the investor’s funds are involved, an office fund which focuses on office spaces close to main stations in the Netherlands, and a residential fund, focusing on mid-market rents in Dutch key regions. For the investor, the building’s interior is more important than its supposed iconicity. Institutional investors are relatively conservative, as the acquisition manager argued, but *Wonderwoods* is not a “trophy project” of a.s.r. real estate, but rather a sustainable and “good product”. As the risks green façades bring along have been mitigated, the investor can ensure to be in control. *Wonderwoods* in this perspective, represents a traditional real estate project, in which the designers and architects are most open to experimentation, and the end users, such as the investors are more concerned with the building’s manageability.

All main actors involved in the project have argued that designing and constructing a vertical forest is quite complicated, or even “a hell of a job”, because of Boeri’s aspiration to create a vertical forest which differs from the *Bosco Verticale*, as the co-architect has stated. Even though green buildings are nothing new in the Netherlands, the “extreme form” in which it will take place in the *Wonderwoods* project has remained rather unexplored. Compared to regular projects there are more interests at stake. The building’s landscape designer has explained why those involved in the project are willing to go the extra mile: “You do put your name to it... you know, that they will say ‘that tower with those dead trees!’, you know.” Nevertheless, all parties seem to believe in the project.



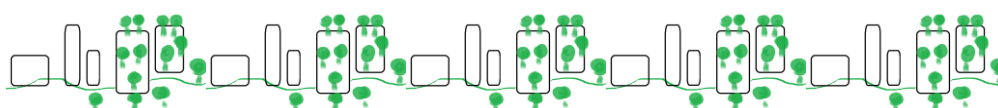
For the City of Utrecht, *Wonderwoods* is not the “pinnacle of sustainable architecture” per se, but considered to be “just the beginning” and a source of inspiration for the future, as the project manager has argued. There is a relative limited set of images remarkable green buildings and projects from all over the globe that are used to visualise the ‘green city’. Within Utrecht’s green city discourse, like in Milan, New York’s High Line is a frequently occurring reference, which even resulted in the construction of the city’s own ‘High Line’, the *Moreelsebrug*. As shown, in the tender of *Wonderwoods* the only green building the website was referring to is the *Bosco Verticale*. The project manager argued that *Wonderwoods*, even if the building is not yet built, has already set the tone for subsequent tenders:

Yes, if we put out a tender now, we are shown, even on other locations for buildings, soon we are shown trees on the roofs, and those things... (...) Yes, and you do not even have to ask for it, I would say.

In this perspective, it can be argued that *Wonderwoods* is deliberately used by local authorities as an instrument to rewrite the city, it is conceived as a green cathedral that will confirm Utrecht’s recent steps in becoming a progressive green city. The building is already considered to be iconic before its erection. It has become a reference point for Dutch green architecture as market parties seem to respond to the city’s ambitions in new tenders by ‘copying’ its design and embracing the living architecture movement. As the project developer has emphasised, the building’s iconic design is expected to be a pull factor in terms of future residents: “Because people say ‘yes, wow!’... In such a building, in a certain conviction, for the love of green, ‘yes, this is where I just want to be!’.” The landscape designer and investors have stated that most probably the future residents will feel a strong sense of pride to live in *Wonderwoods*.

The experiences of the passers-by are mentioned too: “on them it is going to have an enormous effect”. The respondents expect that the building will have a positive spin-off on the surrounding areas after its construction, in terms of living environment, well-being and real estate values, particularly as to the future *Beurskwartier*, which is intended to become the city’s green quarter.

The respondents argued they are having some difficulties in finding the right balance when it comes to the somewhat vaguely defined and conflicting concept of ‘sustainability’. The two towers of *Wonderwoods* embody this ‘struggle’ and the idea that there are two sides to the story. As one can read on the website of the project (<https://www.wonderwoods.com/>), it is stated the building consists of “2 Towers. 1 Mindset”. The first approach to sustainability concerns ‘tangible’ sustainability’, in which greenery is made visual, as is the case for vertical forests, even though this may not be efficient in terms of construction or energy consumption. The second approach is ‘invisible sustainability’, referring to creating energy-neutral constructions, which are not necessarily green ‘from the outside’. Solar panels, for instance, are associated with sustainability, but quite difficult to combine with façades being covered in green.



Trudo Tower: Building a 'bosco' on a budget

In 2017, soon after the development of *Wonderwoods* was announced, the Dutch housing corporation Sint Trudo revealed its innovative concept of the *Trudo Tower*: the first vertical forest dedicated to social housing (Figure XX). This tower was to be built in *Strijp-S*, a former brownfield marked by former factories of the electronics company Philips, once the city's major employer. *Strijp-S* used to be a 'forbidden city', as only Philips' employees were allowed to enter the area. In the Netherlands, housing corporations are semi-public entities, which to a certain extent are allowed to act as commercial real estate developers. Therefore, housing corporations can become key players in various urban regeneration projects. As Sint Trudo had purchased several plots of land when the 'forbidden city' *Strijp-S* opened up, the housing corporation would turn out to play a leading role in the transformation of the area. *Strijp-S* is being transformed into a mixed use urban district, which has its own particular identity, despite being located close to the city centre.

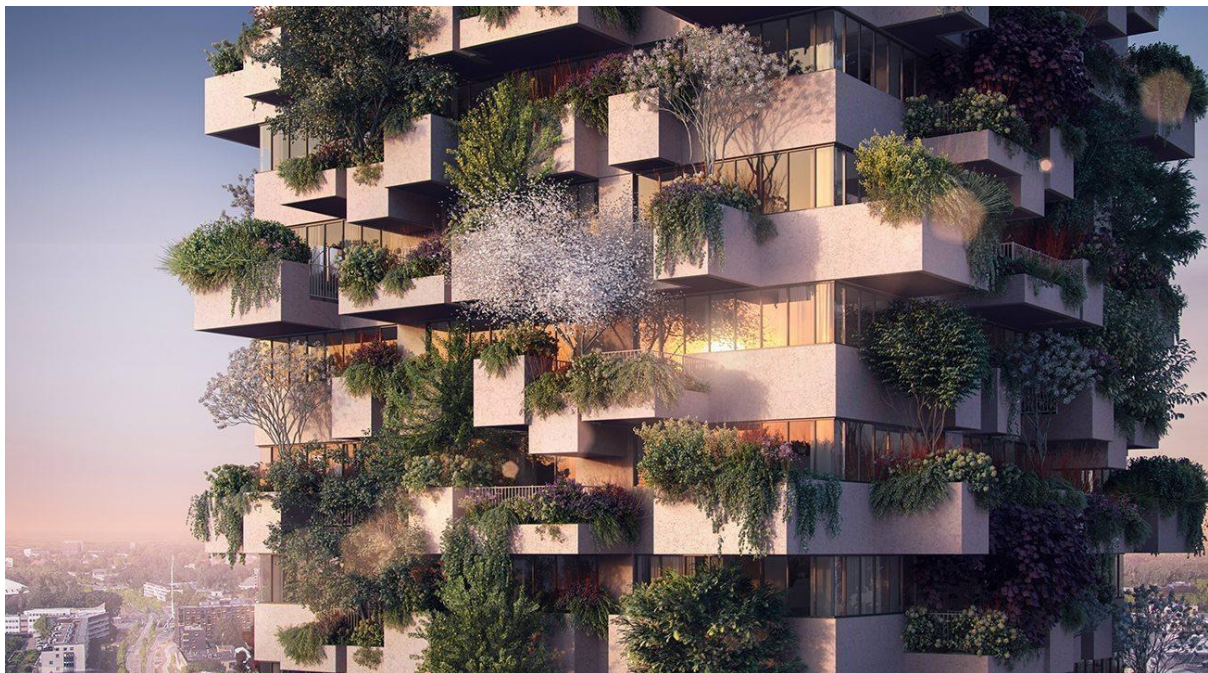
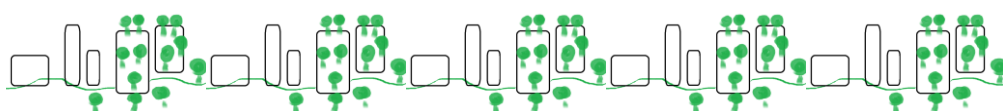


Figure xx: The future green façades of the *Trudo Tower* in Eindhoven.
Source: Stefano Boeri Architetti (2017).

As explained by the project manager of the *Trudo Tower* the housing corporation's board had been inspired by the *Bosco Verticale* during a trip to Milan, which astonished them. The original vertical forest thus inspired the board to start a feasibility study for the housing corporation's own vertical forest in Eindhoven, with the exception the project would occur 'on a budget'. Sint Trudo is a housing corporation with a "cowboy reputation", as the *Trudo Tower's* co-architect has put it. The housing corporation's main mission is, "to shape a part of the city", as the co-architect has argued. Sint Trudo, instead of solely focussing on the particular needs of their target group, uses a "top-down approach" in developing *Strijp-S*. The area is rather "stony", as the project manager has put it. Within the area there were limited options for greening, as many events are taking place in the area's open spaces. A vertical forest was believed to resolve this spatial conflict in an efficient way, and the project also perfectly suited the housing corporation's ambitions and their reputation.



The feasibility study, conducted by architecture and engineering firm Inbo, ensured the confidence in the project. Thereupon, Inbo was assigned the role of co-architect and engineer. The location for Eindhoven's vertical forest, in the centre of Strijp-S, was selected. Although it would have been possible not to consult Boeri at all, soon Sint Trudo did decide to approach the architect "for he just has the expertise", as the project manager has explained. Stefano Boeri Architetti, however, was not immediately excited about the plan. The project manager of the *Trudo Tower* had explained the architect's critical attitude:

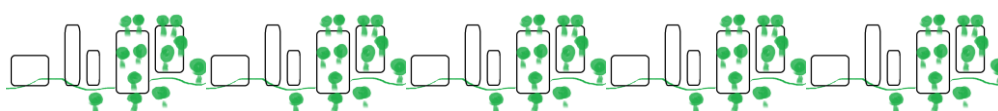
He [Boeri] receives many requests, I think, from all over the world. (...) And he also receives requests that, I believe are eh... perhaps seem to be serious, but eventually... are not that realistic at all. (...). And I believe he even received request from China, and then real estate developers, at the very end, after all had been designed, would ask: "Yes, but can't we do plastic trees?"

The co-architect has added that Stefano Boeri Architetti simply cannot allow failure, for it would mean "bye reputation, bye concept!". Despite some initial prudence, today Stefano Boeri Architetti is widely promoting the first vertical forest dedicated to social housing, which he has called a "step forward" at the World Forum on Urban Forest. As Inbo's architect has explained, it was "a deliberate choice" by Stefano Boeri Architetti. The architectural firm soon realised that by participating in the project, providing that it would be carried out for half of the budget, but with a level of aspiration comparable to the *Bosco Verticale*, their concept of the vertical forest could truly grow wings. Furthermore, the speed at which the project had to be delivered was also a decisive factor, for many of Stefano Boeri Architetti's projects around the globe are still not much more than renderings.

While expressing his enthusiasm for the *Trudo Tower*, Boeri at the World Forum on Urban Forest, also stated that the rents of the *Trudo Tower's* apartments forest will be close to "nothing". This seems to reveal some misunderstandings regarding the peculiarities and complexities of the Dutch social housing system, in which housing is for instance appointed by lot, based on income criteria. Dutch housing corporations are also avoiding any stigmatisation of the less-fortunate. The project manager of Sint Trudo elaborates on these two sometimes conflicting perspectives on the *Trudo Tower*:

We [Sint Trudo] are a housing corporation off course... we are not allowed to construct anything but social housing. But sometimes he [Boeri] has some difficulties with that... in his design. (...) Yes, we have a budget and it should suit the budget.

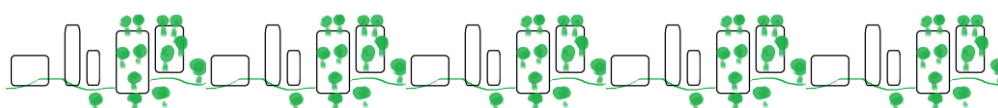
Notwithstanding some early uneasiness and after lowering Stefano Boeri Architetti's sights, the architects, co-architects and the principal succeeded in designing a vertical forest 'on a budget'. The building will consist of 125 social housing lofts and commercial spaces in the plinths. The design is highly efficient, as more economical materials and prefabricated elements are used, without saving on vertical greenery. The architect of Stefano Boeri Architetti has argued that building consists of a "single typology", for all apartments are around 50 square metres. The result is a new type of vertical forest, "absolutely no copy of the *Bosco Verticale*", as argued by the project manager and also stressed by Boeri at the 'tree selection day' in Eindhoven (Theeuwes, 2018).



The idea of the *Trudo Tower* was positively received by the media in general. Furthermore, the building was warmly embraced by green organisations and the local authorities, even though the City of Eindhoven has played a rather limited role in the project, since the initiative was taken by Sint Trudo. However, the design led to initial disagreements between the external supervisor, office for urban design West 8, and the initiators, but soon these were resolved. As one of the urban planners, who has supervised the project, has declared: “The building is already striking, before it has been constructed, and it is expected to attract a lot of attention later as well.” Sint Trudo’s project manager has described the building as an “icon”, even though she has argued that iconicity may have been even more important in the case of *Wonderwoods*. Nevertheless, the tower was named after the housing corporation. The building was also given a prominent location within *Strijp-S*, in front of the area’s event plaza and central bus stop, while being visible from Sint Trudo’s office and the trains passing by.

For Stefano Boeri Architetti, it is now time to show off the world’s first truly affordable vertical forest. The *Trudo Tower* may have been “a little present for Boeri”, as Sint Trudo’s project manager has put it. As the architect of Stefano Boeri Architetti has argued, a vertical forest would have never been thought of, if it had not been Sint Trudo “to raise the bar”. By realising the project, the architectural firm can “dispel a bit the myth” a vertical forest is extremely expensive to construct, and therefore can only be afforded by the elite. As the architect, working on Stefano Boeri Architetti’s Dutch projects, has confirmed, the *Trudo Tower* offers Stefano Boeri Architetti the opportunity to counter one of the main criticisms of the *Bosco Verticale*. The *Trudo Tower* seems to represent a new generation of vertical forests in this perspective. Not surprisingly Stefano Boeri Architetti is thus using its “PR machine” and “brilliant branding”, as Sint Trudo’s project manager and the co-architect have put it. Sint Trudo, on the contrary, has stood aloof from promoting its new constructions plans extensively. In fact, the project manager of Sint Trudo has stated that the housing corporations was already working on its project even before it was announced *Wonderwoods* had won the Healthy Urban Quarter tender in Utrecht, but the housing corporation had decided to wait a little longer, to prevent any damage to their reputation. As explained by the project manager: “And in the end we are faster than Utrecht, because we are already constructing, and... We announced it once we were sure that we were able to manage it”.

Expectations are running high, but all those involved seem to be still slightly cautious in stating that the project will be a success. The project manager stated that she is hoping the *Trudo Tower* will be an “eyecatcher”, a building that will be of added value to the city of Eindhoven. According to the external supervising urban planner the building is a “prototype of an architectonic idea”, while adding that time will tell whether the idea is future-proof “in terms of maintenance, usage and acceptance among residents and the local population”.



Aiming for the Milan effect: Conceptions of the Dutch vertical forests

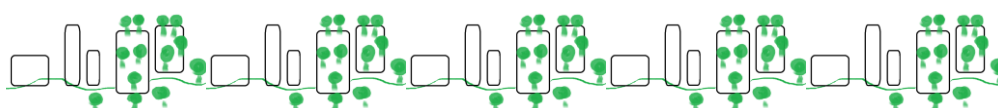
And I absolutely think the Bosco Verticale is a super... a super thing for the local authorities in different... ways, let's say. At the one hand publicity, because if you are on Piazza Gae Aulenti, or see it as a tourist, you are attracted by it, I think. Ehm... and at the same time they use it to convince people of the importance of green, I think, and the beauty of green, and so on.

This quote by Milan-based Dutch architect and tour guide Inge de Boer indicates the great role the *Bosco Verticale* has played in rewriting Milan, according to spatial professionals and experts. The *Bosco Verticale* conveys its spectators, whether they are locals or tourists, a clear message: greening the city is important, urgent and feasible. Furthermore, the *Bosco Verticale* has become an inspiration and reference image for spatial professionals around the globe. The interviews conducted in this study seem to reveal that those involved in the construction of the Dutch vertical forests, expect these buildings to have a great spin-off. In line with the 'Bilbao effect' (Plaza, 1999), often referred to when discussing urban regeneration and iconic architecture, the green city discourse seems to have generated a 'Milan effect'. Vertical forests are expected to attract tourists, new companies and residents, while (re)confirming the image of a green city. The *Bosco Verticale* is conceived as a "clever trick", in the words of a co-architect, used by real estate developer Hines as a boost for the surrounding area. *Isola*, as an existing neighbourhood, is portrayed as a former degenerated neighbourhood by some of the respondents. *Isola's* reputation as a 'disadvantaged' or 'bad' neighbourhood has been mentioned in justification of spatial interventions in the neighbourhood.

Regarding *Wonderwoods*, there is a strong belief in the Milan effect, as can be derived from the statements of MVSA's architect:

If it does work out well, the rest follows as a matter of course, you know? People want to live there eventually, no-one wants to live there at the moment. And soon hopefully they will, and then those restaurants will pop up, and then it follows, right, then the rest follows as a matter of course.

Both in the case of *Wonderwoods* and the *Trudo Tower*, a visit to the *Bosco Verticale* induced the initiators of the Dutch vertical forests to come up with their plans and approach Stefano Boeri Architetti. When discussing the *Bosco Verticale*, there is no clear distinction between the ways in which they conceived and have lived the building, all the more since almost all respondents have been to Milan to see it, often with Stefano Boeri as their personal guide. It becomes clear that the spatial professionals' lived experiences of the *Bosco Verticale* have only ensured their confidence in their own projects of constructing a vertical forest in the Netherlands. The *Bosco Verticale* has been described by the interviewees as "spectacularly good", "very impressive" and "extraordinary", despite some critical remarks on its functional and technical features, which have to be adapted to the Dutch context. The real estate developer of *Wonderwoods* has mentioned that G&S Vastgoed had organised a trip for potential investors, in order to convince them of the feasibility of constructing a vertical forest. The high popularity of the vertical forest in the Netherlands is remarkable. The Italian architect of Stefano Boeri Architetti argued that it may be explained by the Dutch "tradition of experimental architecture", or the fact that the Dutch generally embrace foreign ideas and are used to working together with foreigners.



The two Dutch vertical forests are already conceived as “icons” in the urban landscape, even if they are still to be constructed. As the architect working for Stefano Boeri Architetti has argued: “in the new project, compared to the Bosco of Milan, they are more used by the developer as a flag, a flag of themselves”. The buildings are being associated with making a “statement” or a “gesture”, a “gift to the city”. As the architect of Stefano Boeri Architetti has argued, this has to do with the “public dimension” of vertical forests, which makes this typology appealing.

The future vertical forests in the Netherlands are believed to counter climate change and mitigate negative outcomes of urban densification. According to the interviewees, the buildings will absorb CO₂, improve air quality, reduce smog, store rainwater, provide cooling in summer, reduce noise, enrich biodiversity and “soften” the cityscape. Although the professionals are well aware of the fact that building only one vertical forest in a city is not enough, “every little bit helps” as MVSA’s architect has put it. The buildings are believed to have a great impact in terms of creating awareness. Furthermore, the vertical forests are embodying green ambitions. *Wonderwoods* is being conceived as a catalyst for the future development of the surrounding area *Beurskwartier*. This new neighbourhood should become a green and healthy environment, in the eyes of the local authorities. As the landscape designer has argued when discussing *Wonderwoods*, “in developing the area, it is insanely important too, off course.” A view on Utrecht’s green cathedral is expected to have a considerable market value too. “It may actually be much more interesting to buy all properties around that tower”, even though it is difficult to express the value of greenery in terms of money, as the landscape designer has argued. The *Trudo Tower* is conceived as building that will contribute to an even more distinct identity of *Strijp-S*, reconfirming its status as an experimental area.

Multiple respondents mentioned the *Torre Solaria*, a newly built high rise located in the *ex-Varesine* part of *Porta Nuova*, at the other side of the *Biblioteca degli Alberi*, more or less opposite the *Bosco Verticale*. This building, at least from a distance, looks like the *Bosco Verticale*, but without any trees (Figure 22). The respondents have argued that the presence of the *Bosco Verticale* makes this tower look ‘bare’ and incomplete. A vertical forest, in this perspective, therefore may alter the experiences of nearby edifices too. “You’d rather look at the *Bosco Verticale*”, as the green building consultant of *Wonderwoods* has put it. Vertical forests are expected to offer a different perspective on the surrounding built environment, for they may generate awareness of the importance of greening the city. According to the landscape designer of *Wonderwoods*, the building will convey a clear message: “I am pretty green, why aren’t you?”.

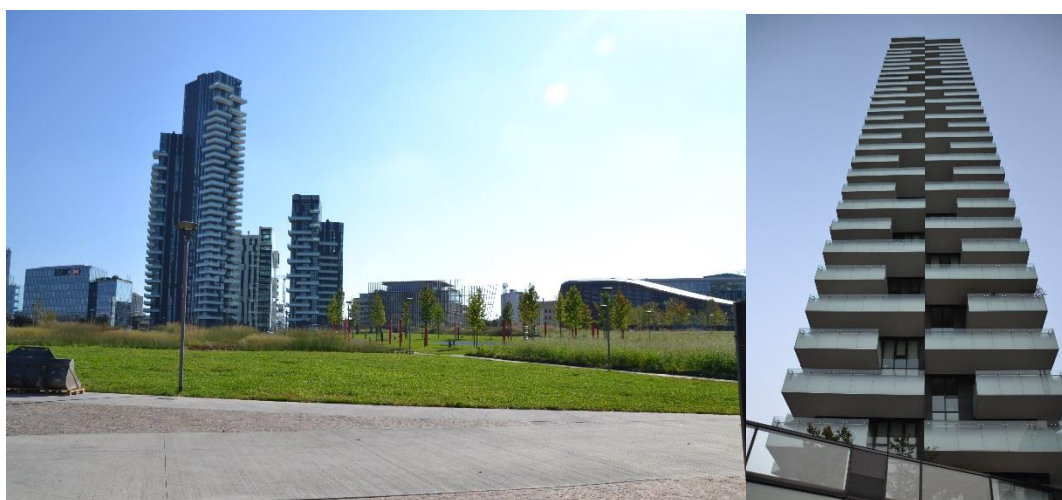
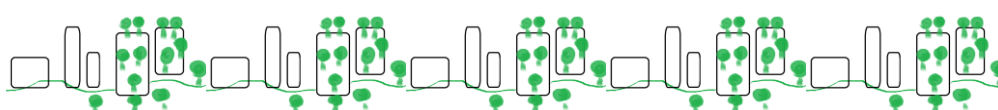


Figure 22: The *Torre Solaria*, located at the opposite side of the *Biblioteca degli Alberi*, described by the respondents as a “bare” *Bosco Verticale*.

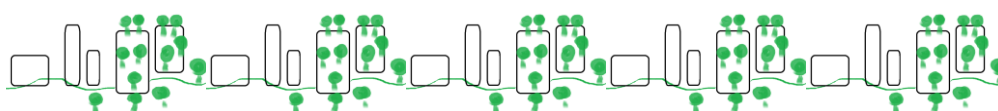


In line with Boeri's ideas, the Dutch vertical forests are conceived as living buildings, the appearance of which will change over time, following the seasons. The respondents have expressed some concerns on the 'winter image', as this is a point of critique concerning the *Bosco Verticale* and the Dutch climate may be even more severe. However, the fact that a vertical forest may have a bare appearance is also believed to be an inherent feature of a living building located in northern Europe.

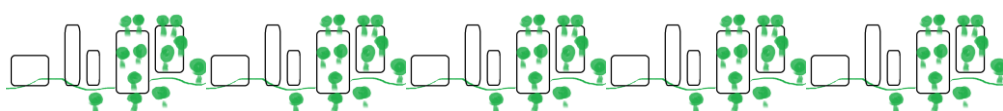
The Dutch firms involved in the two construction projects in the Netherlands have often already worked together before, which indicates a rather "small world" of vertical forest business. Many respondents have argued that their own projects include some improvements compared to the *Bosco Verticale*. The Dutch vertical forests are adapted to the needs of the Dutch, according to the respondents. Stefano Boeri Architetti also seem to consider the development of vertical forests as a work in process, which is adapted to different project conditions. The architect has argued: "But that one... is perfect the way it is, the Bosco in Milan... In the sense that we are trying every day in our new projects." As a green building expert has argued, the residents of the Dutch vertical forest will cook at home, contrary to the celebrities residing in the *Bosco Verticale*. In this perspective, Inbo has played a crucial role, as Stefano Boeri Architetti's sparring partner for both projects, by translating Boeri's concepts into a design that suits the Dutch context. As the co-architect explained, Stefano Boeri Architetti tends to draw "Mediterranean floor plans" for instance, which are too "introvert", i.e. cold, for the Dutch climate. Furthermore, Inbo is aiding Stefano Boeri Architetti in finding their way in the Dutch building culture and building regulations, which are not always understood by the Italian architects, including Boeri, who is sometimes showing "Italian temperament".

Despite the most sincere intentions of both Stefano Boeri Architetti and the other parties involved in the construction of the vertical forests, laymen may be more sceptical about the constructions plans. "People from the city" sometimes consider it a "sales pitch", as MVSA's architect has mentioned. On the critical website *Bouwput Utrecht*, a user has left the following telling comment: "Very nice images but also exemplary for this kind of tenders. By promising much you will win the contract." In Utrecht, the *Croeselaan*, a long street along the central station and the Healthy Urban Quarter, is being transformed into "one of the greenest and most sustainable streets in the Netherlands", in the words of the project manager of the City of Utrecht. However, not everyone will benefit from this transformation. Some dwellings are to be demolished, in order to make room for an urban park, which will be the green corridor of the future *Beurskwartier*. This has led to some controversy, as can be concluded from a headline in which the residents of these dwellings are being quoted: "We have to bugger off for a stupid little park!" (van Heesbeen, 2017).

Nevertheless, in the view of many of the spatial professionals, cities of the future are filled with more "green pearls", as the project manager of the City of Utrecht has described. This may already occur in the near future: "And we, I do not rule out the possibility that in the next tender, we will opt for a building with a least a similar green appearance. (...) We need greenery, that is just... that is obvious." This greenery is needed, for the future city is becoming ever more dense, according to experts. In addition to living buildings, the professionals predict that any building will be more sustainable in terms of materials, installations and technology. As the project director of Stefano Boeri Architetti has argued, Stefano Boeri "cares a great deal about stating that the *Bosco Verticale* is not a copyright. It not a brand, founded by us". Stefan Boeri Architetti thus even promotes the further development of vertical forest and similar building typologies by other architectural firms.



In sum, vertical forests are conceived by their creators and experts as green gifts to the city, which will have a major impact on the perceptions and experiences of the urban landscape. They are conceived as urban icons, for they are eye-catching living buildings that appeal to all. Vertical forests are expected to attract people and flows of money, as they are interesting investments. The buildings are believed to create awareness of the need for nature within cities that become ever more densely populated. In this context, vertical forests are seen a “the lungs of the city”, providing urbanites with fresh and clean air. By adding “green oases” to the built environment, the aspirations of spatial professionals are to bring back nature to the city. A vertical forest may eventually have a green multiplier effect within the surrounding area, as nature takes over slowly but gradually.



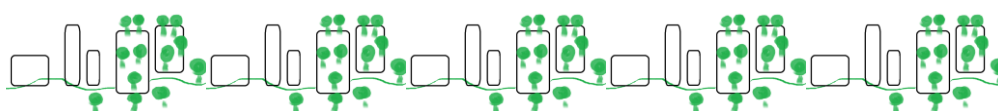
Chapter 6 - Conclusions & recommendations

Conclusions

The *Bosco Verticale* is the world's first vertical forest, and has created a building typology which is slowly but gradually conquering urban landscapes on a global scale. As the green city discourse is becoming ever more hegemonic in urban decision-making, vertical forests seem to be its concrete manifestation. Changing society requires "the production of an appropriate space", as Lefebvre (1974/1991, p. 59) argued. Vertical forest seem to represent a space appropriate for the future of cities. These vertical forests are embodying cities' high ambitions to create green, healthy and sustainable urban environments. In this perspective, it is not surprising the Dutch cities of Utrecht and Eindhoven, known for their progressive and innovative approaches to urban development, have welcomed the concept of the vertical forest. The research questions will be addressed based on Lefebvre's spatial triad.

The first question in this study sought to determine the conceptions and intentions of spatial professionals and authorities, in regards to the design and development of vertical forests. Vertical forests were conceived by their creator Stefano Boeri and other spatial professionals as 'eco-icons', living buildings that change their appearance following the rhythms of nature. These green 'gifts to the city' are believed to bring relief in cities, as urban environments are constantly becoming densely populated, polluted and hectic on a global scale. This study reveals that the key actors involved in the projects of the two Dutch vertical forests are assuming the vertical forests will have the much desired 'Milan effect', despite the disparate contexts the two high-rise buildings originate from. These key actors, whether working in the (semi-)public or private sector and regardless their role, expect the building to attract visitors and companies, appeal to local residents and have a great spin-off in the urban regeneration of the surrounding area. Furthermore, it is expected that these verdant buildings will create awareness of the importance of greenery in the urban landscape. They seem to represent urban totems conveying clear messages and ideas of an (alternative) urban future. The *Bosco Verticale* was not only designed as a "project for the environmental survival of contemporary cities" (Boeri, 2016, p. 61) or an instrument to rewrite Milan's story, but also as an excellent investment opportunity and a catalyst for developing *Porta Nuova*.

Returning to the second research question posed at the beginning of this study, concerning the spatial practices in the public spaces surrounding the *Bosco Verticale*, this research has shown that these spaces are used by different groups, for various purposes. The streets surrounding the *Bosco Verticale* are used by many local residents and Milanese people on their way to work or school and the *Giardino De Castillia* has grown into a robust meeting place for local residents. In the garden, families, youngsters, couples and the elderly mingle among each other. Local residents come to the garden to play with their children, chitchat, hang out or simply relax. As many tourists, both foreign and Italian alike, visit *Porta Nuova* to see the 'new Milan', they also take pictures of the *Bosco Verticale* and spend time in its surrounding public spaces. However, relatively few enter the garden or the *Isola* neighbourhood. The recent inauguration of the *Biblioteca degli Alberi* has enlarged the public spaces which surround the *Bosco Verticale* and from which the building can be experienced. Based on the findings of this study, a preliminary conclusion maintains that the *Giardino De Castillia* will nevertheless remain a public space which is appropriated by locals, compared to the *Biblioteca degli Alberi*. Further research is needed to confirm these findings. All in all, the spatial practices in the public spaces surrounding the *Bosco Verticale* are widely varying, which shows the building is playing a role both as a mundane 'décor' and a meaningful destination in urban daily life.

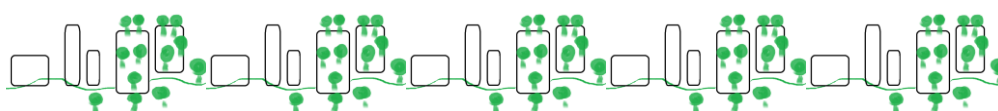


The third research question in this study concerned the lived experiences of the *Bosco Verticale*, focusing on local residents and the people encountering the building in their daily lives. This study has revealed that the building is widely appreciated by local residents and the people frequenting its surrounding public spaces. The *Bosco Verticale* and the surrounding public spaces, particularly the *Giardino De Castilia*, are experienced as a welcoming green escape from the hustle and bustle of urban daily life. Although further empirical evidence is needed, a preliminary conclusion to be drawn from this study is that vertical forests may grow into restorative environments with therapeutic qualities.

Despite a strong sense of nostalgia, felt in particular by elderly local residents, the green exterior of the *Bosco Verticale* has had a positive impact on local residents' perceptions and experiences of their neighbourhood. Many have felt a need for a transformation of the area, despite strong concerns and resistance in earlier phases of the *Porta Nuova* project. The fear expressed by the opposition at the start of the construction seems to have been valid, for the *Bosco Verticale* is indeed still looked upon as a home of the elite and is considered by many to be an exclusive luxury area. In this sense the building, lived by many as a 'ghost house', symbolises pompous power and economic exclusion.

However, the negative experiences of the *Bosco Verticale* do not seem to affect the local resident's overall appreciation of the building's exterior. This is a striking result of the data, as such positive experiences contradict the previous assumptions in eco-gentrification literature and earlier criticisms of the *Porta Nuova* project. The *Bosco Verticale* seems to have reinforced a sense of belonging, and some local residents even seem to care for 'their' skyscraper. The building's green façades and its surrounding public spaces are highly esteemed by local residents, more than any other part of the new *Porta Nuova* district, which is experienced as an 'internationalised' area and which many residents cannot (yet) relate to. The building's myths and mysteries, including the idea that a number of celebrities ought to live inside the apartments of the *Bosco Verticale*, also continue to circulate, and stimulate many local resident's imagination.

Scholars have pointed out the negative outcomes of eco-gentrification processes. This study has revealed that *Isola* is a prime example of how the 'ideological' green city discourse is strategically utilised by key actors in urban regeneration, under the guise of ecological sustainability for the ultimate goal of political and economic gain. Nevertheless, *Isola* today is a neighbourhood that has preserved much of its peculiar identity, even after radical spatial interventions. It is unlikely that ongoing gentrification processes will fade out the characteristic ambiance of the once isolated neighbourhood in the near future, although some caution is urged when it comes to the needs of local residents in future developments; they are the ones that contribute the most to the appealing look and feel of the neighbourhood. Overall, the *Bosco Verticale* seems to be lived by local residents as a positive outcome of urban regeneration, although there is some resentment concerning the building's "ambiguous' message", of reconfirming the urban inequalities between the haves and the have-nots. Eco-gentrification processes in *Isola* may not have yet led to the displacement of long-term residents. However, this study has shown that local residents have been 'dominated' by local authorities, real estate developers and investors throughout the *Porta Nuova* project. Yet it has also shown that the *Bosco Verticale*, four years after its completion, is warmly embraced by many local residents. The insights gained into the lived dimensions of the *Bosco Verticale* seem to confirm that vertical forests appeal to many, and contribute to the happiness and well-being of local residents.

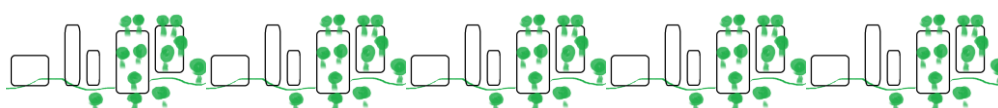


The main question posed at the beginning of this research sought to determine the extent to which vertical forests can alter the everyday experiences of the urban landscape. In addressing this question, it is relevant to confront the conceived, perceived and lived dimensions of vertical forests. The aim of this study was to examine whether the expectations and intentions of spatial professionals in regards to vertical forests, are actually lived by the people encountering the world's first vertical forest, the *Bosco Verticale* in Milan, in their daily lives. This study has revealed that the conceptions of spatial professionals and local authorities correspond to the lived experiences to a considerable extent. Nevertheless, the narratives used by those dominating the "production-consumption system" (De Certeau & Giard, 1998, p. 138) are different. Their narrative, in the case of *Isola*, highlights the need for transformation in what used to be a degenerated neighbourhood and the urgency to an urban void that had to be filled up. This narrative seems to have been partly adopted by local residents. Rather than emphasising the (former) socioeconomic deficiencies of their neighbourhood, however, their narrative is focused more on the previous lack of green spaces in the area. In this perspective, despite some sense of nostalgia, the *Bosco Verticale* is considered a blessing by local residents. Whereas vertical forests are conceived as solutions for climate change by spatial professionals, by merely summing up their environmental benefits, such conceptions need not correspond to the directly lived dimensions of this building typology. First and foremost, the *Bosco Verticale* is experienced as a green escape in urban daily life. Therefore, bringing nature into the city, may be the most truly valuable and convincing feature of vertical forests.

This explorative study has shown that a vertical forest may strongly alter the everyday experiences of the urban landscape. Vertical forests and their surrounding public spaces can grow into meaningful green meeting places for local residents and the people encountering the building in their daily lives, enforcing their sense of belonging. Vertical forests are invaluable eco-icons in the urban landscape, if the urban public is enabled and encouraged to experience them.

Recommendations

The fourth research question raised in the beginning of the study sought to determine lessons that can be learned from the lived experiences of the *Bosco Verticale* in Milan, in regards to the future vertical forests in the cities of Utrecht and Eindhoven. The results of the study underline the statement that urban space is always subject to change and should be considered an ongoing process, as argued by Lefebvre (1974/1991). The case study of *Isola* and its *Bosco Verticale* does not undermine that eco-gentrification is a true risk in cities, given the fact that the green city discourse is becoming ever more manifest in the built environment. When delving into the history of the *Bosco Verticale* and the development of *Porta Nuova*, a "production-consumption system" (De Certeau & Giard, 1998, p. 138) is uncovered, which has been dominated by spatial professionals, and in which economic speculation has been at the basis of strategic choices. The limited influence local residents have had in this transformation, despite strong opposition and protest, is worrisome. Nevertheless, the *Bosco Verticale* also represent a green building which has had a positive impact on the surrounding environment and fulfilling an important role in urban daily life for locals. The results of this study therefore suggest that, although local residents should be involved and included in urban regeneration extensively, vertical forests have the ability to alter people's lived experiences of the urban landscape in a positive way. Although they may foster (eco-)gentrification processes, they are unlikely to fade out an existing, historical identity of a neighbourhood. Rather they represent a positive impulse. Therefore, they are invaluable instruments as green beacons within urban landscapes under construction, which are likely to be embraced by local residents.

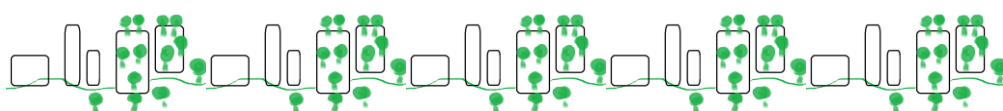


Stefano Boeri Architetti have argued that the “public dimension” of vertical forests is one of the most distinctive qualities of this building typology. This case study has revealed that the *Bosco Verticale* indeed has an extensive public dimension, for its green façades are enjoyed by many local residents. This, however, may also be due to the fact that the small-scale public spaces at the foot of the *Bosco Verticale* are inviting to local residents, as they are enabled to relax, chat and play in the garden, while enjoying the green view. The present case study suggests that a surrounding ‘new’ green public spaces, such as the *Giardino De Castilia*, can eventually grow into robust meeting places for a varied public. Such public space therefore seem to represent inclusive public spaces, which do not only consists of tourists. It is therefore highly recommended to take into consideration the public dimensions of vertical forests when designing and developing such buildings. Vertical forests should not be regarded as a substitution of ‘horizontal’ green spaces in cities, rather they are an enrichment to the urban landscape. Green buildings are off little added value to the urban landscape if they cannot be enjoyed and observed from close quarters by a wide range of people, local residents in particular. By creating small-scale meeting places which first and foremost cater for locals, such as the *Giardino De Castilia*, a vertical forest is more likely to be lived as a welcoming and meaningful ‘green escape’ in the hustle and bustle of cities becoming ever more densely populated. By creating such inclusive but intimate public green spaces, urban decision-makers and spatial professionals can ensure a vertical forest will alter the everyday experiences of the urban landscape in a positive manner.

The inauguration of the *Biblioteca degli Alberi* has led to an even more extent coherent urban landscape, in which nature represent a strong connecting element bringing together both historical and contemporary architecture (Figure 23). Urban decision-makers would do well to integrate vertical greenery, such as living buildings, into a larger coherent green urban context. Nature, providing that it can be actively experienced by citizens, has the ability to connect historical buildings with new constructions, bring coherence and reinforce a sense of belonging.



Figure 23: Nature as a connecting element in *Porta Nuova* after the inauguration of the *Biblioteca degli Alberi*.



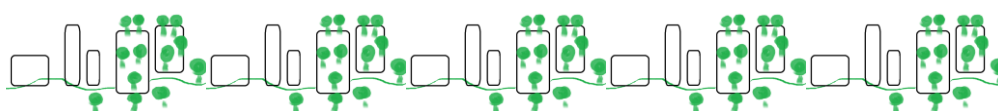
The main criticism on the *Bosco Verticale* expressed by local residents is its “ambiguous message”. In this respect, the two Dutch vertical forests, *Wonderwoods* and the *Trudo Tower*, have some promising features. *Wonderwoods*, as compared to the *Bosco Verticale*, is a more open building, for it consists of some publicly accessible functions, among which retail, the ‘Education Hub’ and the restaurant which gives entrance to the rooftop garden. In this perspective, it is probable that *Wonderwoods* will send a less ambiguous message to the urban public. The *Trudo Tower*, which is intended for social housing, will undoubtedly dispel the myth of the expensive, unaffordable vertical forest. Nevertheless, due to their prominent locations, it is key to integrate these buildings into a wider green urban environment, to maximise their impact for on the everyday experiences. It should be considered, however, that privatised, “anonymous spaces” under close surveillance, which can for instance be found in the ground floors and the pavements around towers of the *Bosco Verticale*, thwart a true connection between the building’s interior and exterior, and between its residents and the urban public. Vertical forests are powerful instruments in creating awareness and promoting the green city, for they bring nature to the city and ‘display’ sustainability. However, the negative outcomes of eco-gentrification processes, which may be stimulated by vertical forests, should not be overlooked. Although a cautious approach is called for, vertical forests can become true eco-icons within a transforming urban landscape, which have a positive impact on the everyday experiences of urbanites.

Discussion

As vertical forests, and many other types of living buildings, are arising in cities around the globe, they are a compelling research topic for urban geographers. The conclusions in this study have been based on the results of one case study, the *Bosco Verticale* in Milan. The ethnographic study, inspired by the work of Loughran (2014), has turned out to be a valuable research method for investigating spatial practices and representational space. However, in conducting the ethnographic study and the street interviews, it was chosen to focus on public spaces from which the respondents were able to see the *Bosco Verticale*. This may have had a selective effect on the sample of participants, for they were per definition people who tended to spend time in the public spaces around the *Bosco Verticale*. Although respondents have been asked whether they expected other local resident to agree with their statements, and a more critical expert was interviewed as well, this approach may have influenced the rather positive perceptions and experiences expressed by the participants. Although the ethnographic research was conducted over a period in which a change of season, from summer to fall, was perceptible, it is likely weather conditions have had an impact on the people’s lived experiences of vertical forests, as it has been argued by some participants that in winter these experiences may be less positive.

In the (near) future, other vertical forests are to be constructed, among which the two Dutch vertical forests. As this study has solely focused on the ways in which these buildings are conceived by spatial professionals, further research is needed to gain insights into their lived dimensions once these buildings have been constructed. In this study it was assumed that conclusions from the case-study of the *Bosco Verticale* may also apply to the two future vertical forests in the Netherlands, despite differences in climate, culture, urban context and genesis of the building. Future investigations may confirm or reject these assumptions.

In future research, it may also be possible to examine whether the ‘Milan effect’ will truly occur in the Dutch cities of Utrecht and Eindhoven. Besides, further research is needed to investigate whether vertical greenery can become a “restorative environment” (Kaplan & Kaplan, 1998, p. 138). A vertical forests only represents an extreme example of a broader range of green and ‘living building’ typologies, future research to lived dimensions of different types of green buildings is recommended.



Reflection

This study aimed at providing insights into lived dimensions of vertical forest, which has hitherto been a research gap in academic literature. Vertical forests have proven to be an intricate and compelling research subject. In conducting this study a multimethod approach was employed by the researcher, in line with the explorative nature of this investigation. It should be mentioned that such an approach has implications in terms of completeness and the degree of detail of the data gathered. Besides, a multimethod approach has proven to be time-intensive.

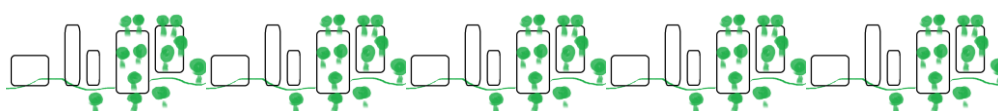
In conducting an ethnographic research, spending time in the public spaces under scrutiny has proven to be valuable, for it allowed to enhance the understanding of the local context, to perceive the changing of the seasons and to build rapport with local residents and shopkeepers. Systematic observations have laid out a foundation for an ethnographic sketch. However, more focused systematic observations, conducted at one or two locations, would have enabled to delve ore into certain spatial practices and perceptions of the *Bosco Verticale* and its surrounding public spaces.

As a researcher, it has proven to be hard to approach people who appear to be engaged in activities, or who seem to be in a hurry, for they are not easily approachable. Therefore, many of the street interviews occurred in a somewhat spontaneous manner, which led to a sample of participants that were willing to spend time to participate in an interview. However, this approach also implies that those who participated in the interviews were people who enjoy, or at least do not avoid, spending time around the *Bosco Verticale*. This might cause the results to be biased, as the participants tended to report rather positive perceptions and experiences of the *Bosco Verticale*. Conducting interviews with other local resident, at different locations in the neighbourhood or at a location of their choice, would have solved this selective effect. Such an approach, however, also implies the participants are not able to actively reflect on the building during the interview, as they have to recall the building from their memory, which may lead to biased outcomes as well. Although the respondents have been asked whether there are also more critical voices in the neighbourhood, the particular setting of the interviews, as well as the and the selective ways in which participants approached, may have resulted in the rather positive outcomes of the study.

Arguably, participatory research methods would have enriched the study on the lived experiences of the *Bosco Verticale* and the surrounding public spaces. Walk-along interviews, for instance, allow participants to reflect on their perceptions and experiences even more, in comparison to the static street interviews. Mental mapping could have also been applied, to enhance the understanding of spatial practices and lived experiences. As it was expected participatory methods would be rather time-consuming, it was chosen not to employ such an approach. Besides, the data gathered by participatory methods would probably only concern people who are able and willing to spend more time, resulting in a smaller number of participants.

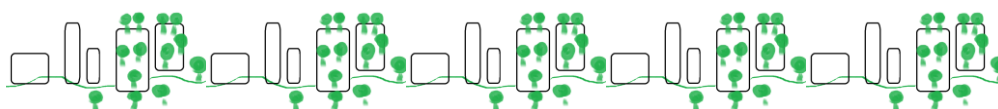
As the research was conducted over the course of a number of months, many key actors involved in the design and construction of the Dutch vertical forests were reached, as well a number of experts, were reached and interviewed. This has resulted in a sample of respondents, in which professions and various interest were represented, in order to ensure a complete picture of the conceptions and intentions of spatial professionals and authorities in regards to the *Bosco Verticale*. The data gathered by conducting the interviews have been enriched by an analysis of a number of journalistic accounts, to ensure a more critical reflection on the respondents' statements. Nevertheless, the analysis should be interpreted with caution, as political, economic and personal interest may have affected their expressions.

Conducting the street interviews in Italian has been conducive to the reliability of the data gathered, as the interviewees were enabled to express their thoughts in their native language. However, it is important to acknowledge that there is a risk of misinterpretation and mistranslation of the data collected via interviews, for these were conducted in both Italian and Dutch whereas the findings have been reported in English.

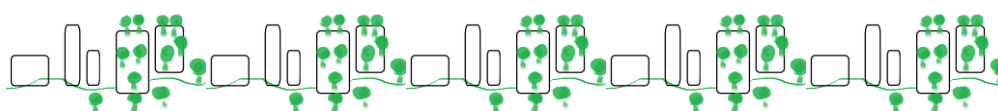


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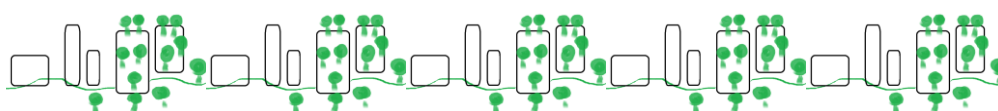
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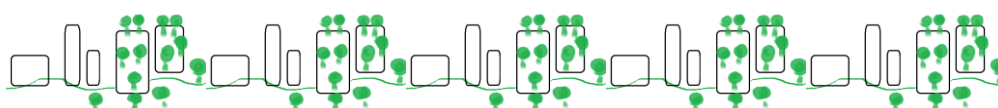
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Appendices

Appendix I – Observation scheme

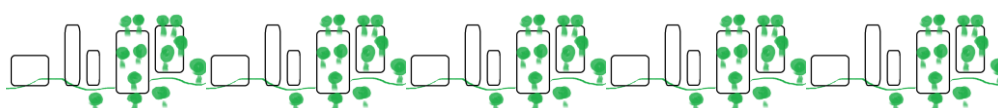
Example

Observation diary code	Date	Month	Day	Time	Time of day	Temperature	Weather conditions	Site
Example 1	xx-sep-2018	September	Wednesday	08:30-09:00	MAT	22	Sunny, no wind.	Terrace RED Feltrinelli (PGA/PLV)

Site description	Bikes (if counted)	Bikes remarks	Activities	Clothing	Accessories/bags/items	Remarks/peculiarities
From the terrace, you can see the BV very well, as well as this side of the PLV. The BdA is fenced as it is not opened yet. Two trucks are parked at the site.	103	Regular Bikes: 85 BikeMi: 15 Mobike: 2 Ofo: 1 11 pp wearing helmets	Predominantly walking or cycling, sometimes while making a phone call or looking at their phones. Also walking with dogs and studying.	Formal or casual	Wheeled suitcases, shopping trolleys, baby prams	xxxx

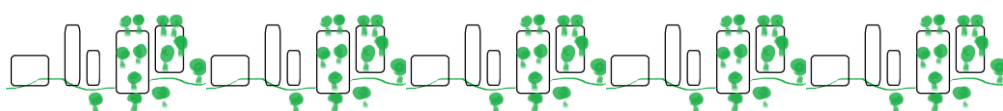
Explanation

Time of day			
MAT pr.	Mattina presto	Early morning	06:00-08:00
MAT	Mattina	Morning	08:00-12:00
PRANZO	Pranzo	Lunch time	12:00-15:00
POM	Pomeriggio	Afternoon	15:00-19:00
SERA	Sera	Evening	19:00-00:00
NOTTE	Notte	Night	00:00-06:00
Abbreviations persons			
M	Male (man/men)		
F	Female (woman/women)		
Ch	Child(ren)		
Pp	People/persons		
Abbreviations places			
BV	Bosco Verticale		
CdM	Casa della Memoria		
PLV	Passeggiata Luigi Veronelli		
PGA	Piazza Gae Aulenti		
BdA	Biblioteca degli Alberi		
VGdC	Via Gaetano de Castillia		
Giardino De Castillia	GDC		
Via Federico Confalonieri	VFC		



Appendix II – General topic list street interviews

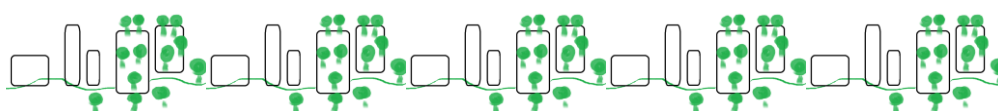
- Introduzione (*introduction*)
- Nome dell'edificio (*name of the building*)
- Nome dell'architetto (*name of the architect*)
- Sensazioni/idee/impressioni (*experiences/ideas/impressions*)
- Trasmette un messaggio? (*does it convey a message?*)
- Ruolo nella vita quotidiana (*role in everyday life*)
- Parole che vengono in mente (*words that come to mind*)
- Assaggio del futuro? (*a foretaste of the future?*)
- Nuovo parco (*new park*)
- Altri edifici simili all'estero (*similar buildings abroad?*)



Appendix III – Code tree street interviews

Axial codes	1	2	3	4	5	6
	Appreciation	Fascination	Green escape	Ghost House	Insignificant	Need for transformation
	Beautiful	Special	Sense of tranquility	No idea of what's inside	It's telling little	Gift
	Very glad	Elegant	Brings peace	There's no light	Get used to it	Very glad
	Appreciated	Stupendous	Pleasant	There's water	New and empty	Used to be infamous
	Clean	Everyone's an architect	Relaxing	One has to go inside to fit	Doubts about th	Upgraded
	A nice view	I come to the site to see it	Breath	Arabs	At the beginning	Madonna, l'Isola?
	Foreigners like it more	Positive	Fresh air	Few Italians		Bandits
	Should be studied	Paradise	This thing that is always higher	Rent or property?		Criminality
	Embellishes the present	Unique	Living outside	Inhabitant cannot touch the plants		Abandoned
	Modernity	Intriguing	Forest	No one enters, no leaves.		Luxury place
	Well integrated	Astonishment	Expanding	You never see anyone		Don't want to remember
	Beautiful architecture	Oasis in the desert	Brings you outside the city	I don't know who lives there		Used to be a meadow
	Modernity does not only me	Spectacle to see it being constru	Following the rhythms of nature	It's closed		Everything is new
	Well maintained	A masterpiece	Light	They are travelling around the world		Central location
	Innovative		Saving the trees			Intersection
	Little Dubai		Full of nature			Should upgrade
	Brings a bit of green into the city					Used to be ugly, degenerated, very old
	We did a good job					Changed for the better
	A good idea					Extreme periphery
	The new and the old					There was nothing
	They did well					Investment
	Brought nature to the balconies					No periphery anymore
	Interesting					Connects the two parts
	Nice experiment					They worked hard
	Curiosity					No tragedy
	Harmonious context					I don't have this memory
	Everyone is satisfied					Regenerated
						Positive from a commercial point of view.
						Has brought life
						At the border of the neighbourhood
						Old houses don't look good in such a modern cor
						Brings Milan closer to the great cities of Europe
						Long time waiting
						More beautiful now
						Weak area
						Has internationalised Milan
						Liveable area

	7	8	9	10	11	12	13	14
	Sense of belonging	Sense of nostalgia	Decesive factors	Danger	Spin-off	Meeting place	Home of the elite	Nuisance
	We see it from anywhere	History	Price	They may fall	Inspire people	The elderly come here	Luxury place	Paying in the form of nuisance
	Sense of belonging	Island	Maintenance	Fear	A nice walk	There are benches	Celebrities	Drug dealing
	Enjoyable to all	Good people	Costs		Less dangerous	Chatting	Economic differences	Drunk people
	Neighbourhood feel	It's not that I didn't like Isola bef	Energy savings		Curious Milane	Many elderly	Gym inside	Nightlife zone
	Accessible to all	Nostalgia			Fashionable ne	Have fun	Spa inside	Disaster
	Contrast	I will stay here			Too many bars,	Resting place	Can't afford	Everone wants to live here
	Historic thing	Isolated				It is really local	Unaffordable for many	
	Kept its own character	Some like it, others don't				Ordinary people	Few can afford an apartment	
	Keep the neighbourhood t	Italian culture of complaning					Beauty for rich people	
	One can be part of the con	There's some sense of nostalgia					Ambiguous message	
	Market is still the same	People were afraid					Meeting market requirements	
	Our skyscraper	It looks like Corso Como, Brera, Corso Garibaldi					Improductive area	
	The people have remaine	It used to be a working-class neighbourhood.						
	From the first stone	It was completely different						
	Fill up this place	They hate the new						
	Like to have it close	There was some resentment						



Appendix IV – General topic list interviews key actors & experts

- Introductie (*Introduction*)
- Achtergrond en betrokkenheid project (*Background/involvement project*)
- Professionele blik op de groene stad (*Professional vision on the green city*)
- Professionele blik op de verticale bossen (*Professional vision on vertical forests*)
 - Eco-iconische architectuur (*Eco-iconic architecture*)
 - Aannames (*assumptions*)
- Effect op/betekenis voor stadsbewoners- en bezoekers (*Effect on/meaning for local residents and visitors*)
- Verticale vergroening (*Sky-rise greenery*)
- Persoonlijke ervaring verticale bossen/groene gebouwen (*Personal experiences vertical forests/green buildings*)
 - Verwachtingen ten opzichte van de Praktijk (*expectations vs. reality*)
 - Gevoel (*feeling*)
- Samenwerking/contact met Stefano Boeri Architetti (*Collaboration/contact with Stefano Boeri Architetti*)
- “Ik ben het Bosco Verticale/ Wonderwoods/de Trudo Toren, ik....” (*“I am the Bosco Verticale/Wonderwoods/ the Trudo Tower, I...”*)

Appendix V - Code tree interviews key actors & experts

Milan effect	Lived experiences Milan	Countering & mitigating	Adapted & improved Living buildings	Pride	City of the future	
Inspiration Milan	Hearing birds on the upper floors	Cleaning	Cold reception BV	Changing look	Pride	Curious about new typologies.
Icon	Patio feeling	Recovery	Porous city	Following the seasons	Put your name to it	Air purifier.
Vertical forest fits in context.	Spectacularly good	Health	Nature-inclusive	Living product	Grandpa made this	Innovating
Eye-catcher.	Almost improbable	Cooling	Social housing	Visualising sustainability		What's the next statement?
Adding something good to the city.	Intruder	Fine particles	Single typology.			Not doing such a project again.
Attract attention.	Strange	Living environment	Dutch fixed social rent			Vertical greenery must prove its worth.
Intended impuls	Getting a face	Different experience of urbanity	Meeting criticisms			Just the beginning
Clever trick of the real estate developer	Wow	CO ₂	Dispel the myth			Societal task
Booming area.	Not invasive	Liveability	Reducing costs			Adapt to climate change
BV as reference	Have faith in it	Oxygen				
Spin-off		Sound reduction				
Upgrading		Smog				
Inspiring local residents						
Making a gesture						
I am pretty green, why aren't you?						
Attracting crowds						
People want to see it						
Best place to make a statement						
Conveying a story						
Place to stay						
Super thing for the authorities						
Publicity						
Attracting tourists						
Convincing people						
Adds to the neighbourhood						
Office buildings are being upgraded						
Widely known in Milan						
Importance for development of the area						
Buying properties around the tower						
Impact on surroundings						
Making a gesture						
The rest follows as a matter of course						
Taking advantage of it						
New restaurants						
Crucial project for the local authorities						
Liveability						
Flag						
Tourists						
Attracting costumers						

