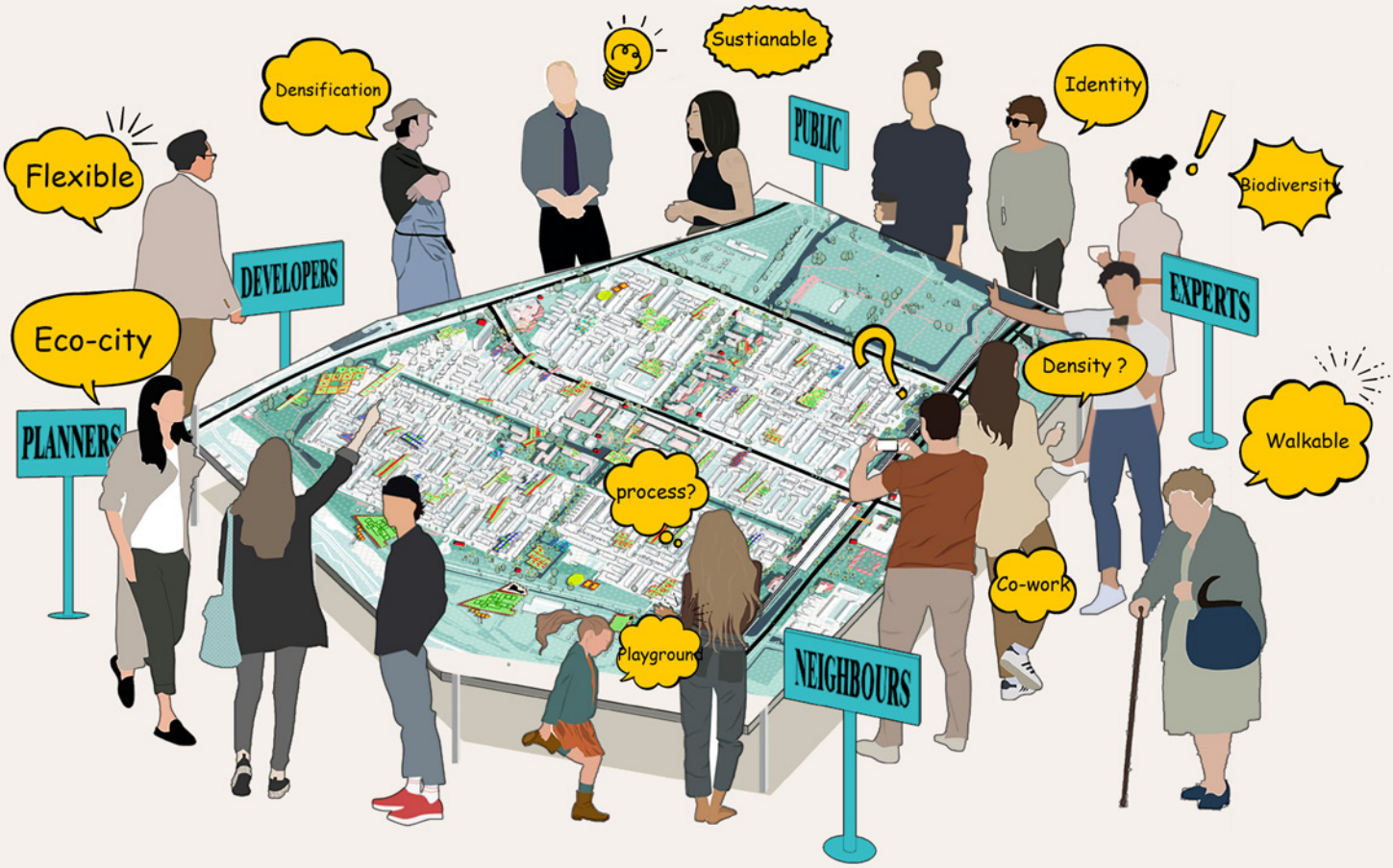
TOWARDS 'PARTICIPATORY LANDSCAPES'



Participatory Model to Encourage, Implement, Upscale
Nature-based Solutions in Urban Context

Graduation Project
MSc.Urbansim
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Colofon

Towards 'Participatory Landscape'
Participatory model to encourage, implement, upscale Nature-based solutions in Urban Context

Master Thesis P5 Report
M.Sc. Architecture, Urbanism and the Building Sciences

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June, 2021
Delft,Netherlands

Towards 'Participatory Landsacpe'

Participatory model to encourage, implement, upscale

Nature-based solutions in Urban Context

Preface

As a result of urbanization, while urban development has brought great benefits to mankind, it has also brought negative impacts on the ecosystem and challenges to the livability of cities. In the 1960s, the concept of ecology began to spread as a response to the deteriorating urban environment. In recent years the scope of urban ecology is expanded greatly. It indicates that more direct and influential relationships between urban Concepts like nature-based solutions (NBS) have been developed to bring together ecosystem-based concepts such as 'ecosystem services, 'green adaptation', 'ecological infrastructure', and 'nature-inclusive design' to address a range of environmental and societal challenges (Bush & Doyon, 2019; Li et al., 2017; Voskamp & Van de Ven, 2015)
Currently, the NBS concept has received wider attention in multi-disciplinary (Cohen-Shacham, Walters, Janzen, & Maginnis, 2016; Raymond & al, 2017; Vujcic et al., 2017). However, considering complex social conditions in the urban environment and the dynamism and heterogeneity of the urban ecosystem itself (Bush & Doyon, 2019; Mees & Driessen, 2011), implementing and managing NBS needs to meet 'trade-offs between functions and across temporal and spatial scales (Bush & Doyon, 2019). Moreover, the implementation of these measures is highly dependent on the cost-benefit balance (Ferreira, Barreira, Loures, Antunes, & Panagopoulos, 2020), but many benefits such as entertainment, biodiversity, and social integration are difficult to The project has been developed in the context of the development of a new urban environment (Barreira, Loures, Antunes, & Panagopoulos, 2020), but many benefits such as entertainment, biodiversity, and social integration are difficult to monetize (Exploring Opportunities for Green Adaptation in Rotterdam 2012). All of these limits the great potential and mainstreaming of NBS contributing to urban livability. The wider adoption of NBS is therefore an issue of concern to society. However, there is no comprehensive strategy for the mechanisms, policies, thresholds, and guidelines for its implementation. But these are not yet well developed in either research and practice.

Rotterdam, the Netherlands, is a suitable venue for the study of this participatory NBS. Firstly, it is an active practitioner of NBS, and the city has embodied a growing concern for sustainable development, with many green adaptation measures now in place, many of which are community-initiated and encourage social participation, and many innovative and interesting practices such as floating farms, floating forests, and a variety of rooftop gardens, etc. Secondly, Rotterdam has adopted many adaptation policies that continue to promote the application of NBS in urban spaces, as well as urban ecological conservation, so there is much to support and explore in this area of research.

This report records the progress of the main work of this graduation design for nearly one year. Firstly, the project was established based on the ecological concerns of cities at this stage, the importance of social participation, and the need to expand the implementation of NBS. Next, the project analyzes the gaps that the general public encounters when participating in NBS from a social psychological perspective, which can be simply understood as what to, why to? want to? and how to. These levels are refined through literature research, documentaries, case study interviews, etc. The next step is to respond to these levels of barriers through a comparative analysis of the various modes of participation in the inaugural project and to develop a socio-spatial intervention strategy. These strategies will be concretized by applying them to the pendrecht community in Rotterdam. The final project revisits the identity of urbanists and reflects on the research findings, methodology, social relevance, and justice, and provides insights for future research. The project will also provide a direction for future research.

I hope you can enjoy the reading.

Ning Cai
In Delft,Netherlands , May,2021

Acknowledgement

The graduation design of 2021 is somewhat unusual in the context of the corona. The graduation design year is mostly completed under self-study conditions in the dormitory, and accordingly, communication with partners during the research process becomes difficult, and one's sources of information are somewhat more closed than before. However, with the support of my teachers and classmates, this year of research and progress has been equally memorable, and I would like to express my gratitude to my loved ones, teachers, and friends who have supported me.

I would like to express my most sincere gratitude to my mentors Remon Rooij and Frits van loon. I would like to thank my first mentor Remon Rooij for his guidance and inspiration on my research style, logical thinking, storytelling, and report writing. This has been invaluable in helping me not to lose my way in my research and to stay focused on the key issues. Thanks to my second supervisor Frits van Loon for providing me with many interesting ideas on urban landscape design, mapping, and storylines. The urban landscape is a relatively new topic for me, and with Frits' help, I have a clearer point of entry.

I am also thankful to the studio coordinator, Nico Tillie. He brought us a lot of interesting lectures and provided us with perspectives and research methods for studying urban ecology, which also made me very interested in this subject.

I thank all the other students in the studio, Baokun, Louisa, Suxin, Pu, Menno, Dorien, Emma, Ivo, David, who inspired me and gave me a lot of meaningful references during the study.

I would also like to thank my housemate Yun Sun, a landscape student, who provided me with a lot of ideas on the landscape perspective during this year's graduation design, and I got a lot of inspiration from her projects.

In this pandemic context, I would also like to thank my classmates for encouraging each other by way of zoom self-study. I would like to thank Tao kong, Chen Gao, Yangzi Li, Baokun Wei, Zhongjing Zhang, Yuan Jia, Jinjie Mao, Yujie Liu, for their support during the online self-study process.

Last but not least, I would like to thank you for the support of your loved ones and the concern of your friends.

Summary

Social participation plays an important role in the process of urban landscape renewal and maintenance. Embodying broader social participation can facilitate the equitable distribution of green infrastructure, increase the capacity of landscape management roles, form multidisciplinary teams and implement precise actions. The theme of the project is therefore how spatial design strategies can stimulate wider participation of urban residents in the enhancement of the urban landscape and living environment.

The case study area is the Pendrecht neighborhood of Rotterdam, which is a city in transition. The post-war reconstruction area is at a turning point in terms of safety and quality of life, having experienced a downward spiral of pollution, violence, crime, and social segregation for decades. In this context, the project hopes to activate the enormous potential of the community and empower residents to regenerate themselves. The project, therefore, wants the nature-based solution to be seen as a catalyst for space, not only advocating for the public to use NBS to activate the use of public space, but also to combat social isolation, build a sense of place, increase employment opportunities, attract investment, visitors and new residents, and together create a more sustainable and liveable city.

The project has three tracks to create a participatory landscape. They are: in the first track, transformative place-making to increase social awareness; in the second track, motivation to participate through public policies, design tools, and the improvement of infrastructure systems; and in the third track, community empowerment through strategies such as the transfer of power and responsibility, the creation of garden operating organizations, phased development and the breakdown of responsibility zones. The project hopes to provide spatial planning and design strategies that can be used as a reference for similar areas and urban regeneration to transform into eco-cities.

key words:
Participatory planning, Nature-based solutions, sustainable urban transformation, spatial strategies

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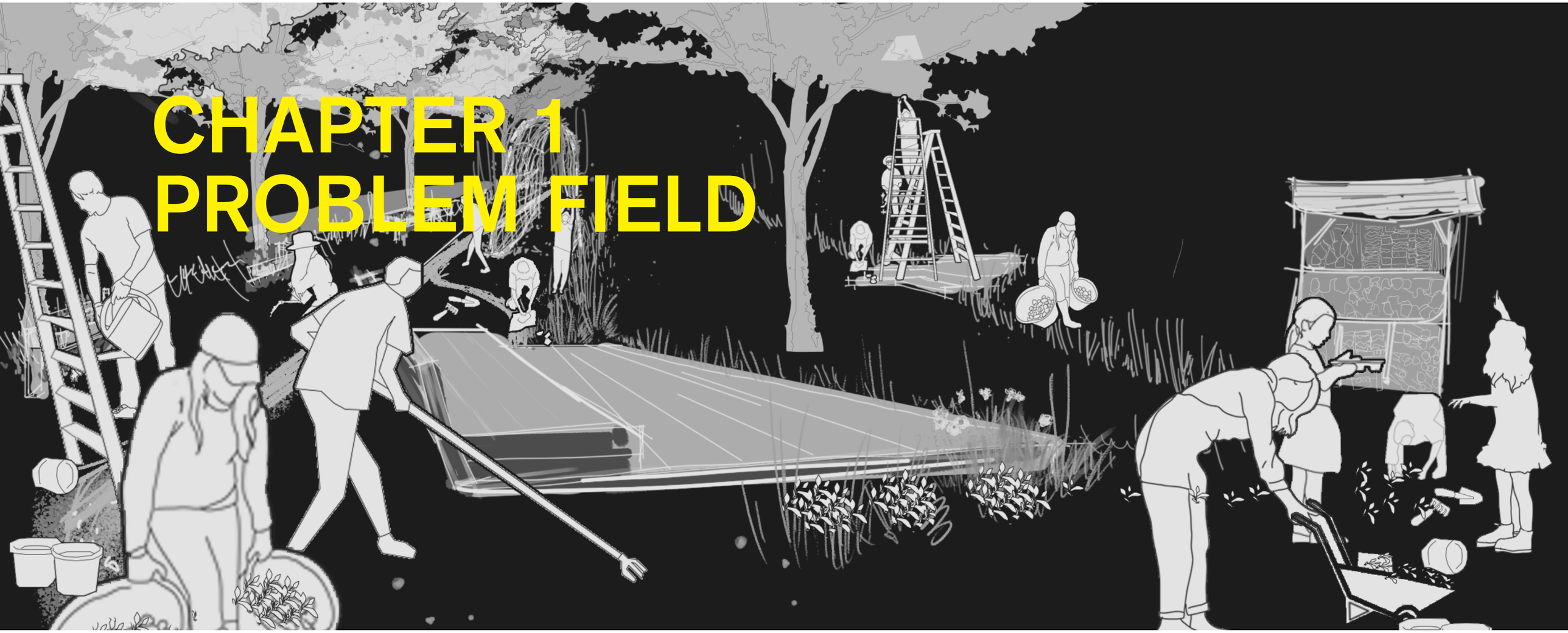
CHAPTER 1
PROBLEM FIELD



This section explains the main research areas of interest, the research context, and the case study area, and presents the research questions for the project.

- 1.1 Motivation
- 1.2 Introduction to the project
- 1.3 Problem field
- 1.4 Research context
- 1.5 Case study area
- 1.6 Research questions
- 1.7 Research objective

1.1 Motivation

Nature in the city is considered to be closely related to the livability of the city and the quality of life of its residents. As an Urban Studies student, I have been learning how to effectively plan and design green spaces and public spaces in cities so that they serve the well-being of residents equitably and efficiently. However, recent empirical studies have shown that, on the one hand, green spaces in cities are often not as equitable and accessible to all as designers and planners would like them to be, and sometimes even become dangerous zones of crime, segregation, and social disparity (Gould & Lewis, 2018). On the other hand, urban green spaces (especially public green spaces) are often seen as the responsibility of governments and landowners, which to some extent increases the maintenance burden on these groups and leads to public apathy, thus resulting in the waste of many social resources.

Therefore, I feel that protecting and building nature in cities is not only the responsibility of scholars and the public sector but also requires a change in the mind of communities and their greater participation. However, how-to guide and motivate them and provide them with options to participate in the green alternatives to achieve a greener and more livable city is the purpose and motivation of this study.

To sum up, the combination of an interest in planning and designing urban green spaces to serve the needs of urban residents in terms of quality of life and sustainable urban development, and an ambition to inspire social groups to organize themselves in urban green spaces, influenced my choice of this 'Urban Ecology and Eco-cities' lab.

1.2 Introduction to the project

The project intends to create an NBS participatory city model from three levels: urban planning, urban design, and urban strategy, to encourage more private groups to pay more attention to urban ecology and adopt the NBS strategy to create a nature-inclusive city.

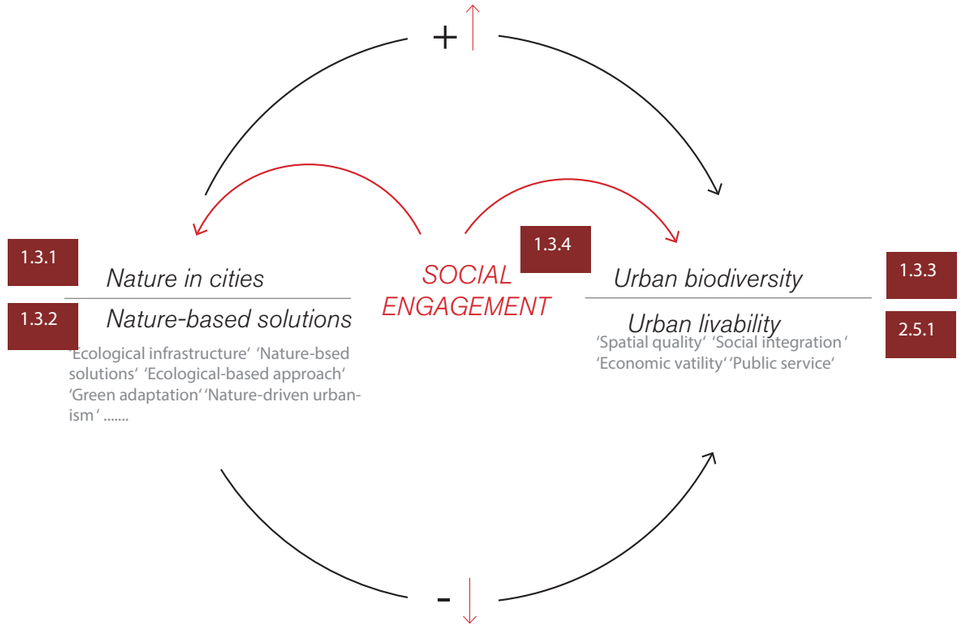
In this project, Nature-based solutions will be a catalyst that not only activates the availability of public space, but also stimulates the community to participate in the process of building and maintaining their nature, and promotes a more sustainable and livable life in the city.

Pic.1.2.1

Three objective of the project. (Illustrated by author)

1.3 Problem Field

Nature in cities has an important impact on the ecology, livability and sustainability of cities. But what is the role of the public in this process, and does their participation bring opportunities for urban space and urban biodiversity, and how can their participation be promoted?
With these questions in mind, this project aims to investigate the relationship between social participation, nature in the city, and biodiversity (Pic.1.3.1).



Pic.1.3.1 The Research field covered Nature-based solution, social engaement & Urban biodiveristy

Sorce: Illustrated by author,

1.3.1 Nature in cities is essential for Urban livability

Nature in the cities, including urban parks, public green spaces, landscaped boulevards, green roofs, etc., as an important spatial type is closely linked to ‘urban livability’ and ‘public health’ (Pic 1.3.1.1). It helps cities mediate urban stress, for example, by providing clean air, food, regulating microclimates, and preventing flooding through infiltration and evaporation. Greenery in cities is also beneficial to the physical and mental health of city dwellers. Studies have shown that nature can help people relieve stress, help patients recover faster, and has the effect of motivating people to get out and exercise and get close to nature, which indirectly promotes social and social harmony. Moreover, urban nature helps cities maintain stable ecosystems and increase their resilience to global climate change, contributing to the energy transition and longer-term urban livability.

Pic.13.1.1 Examples of how nature contribute to urban livability

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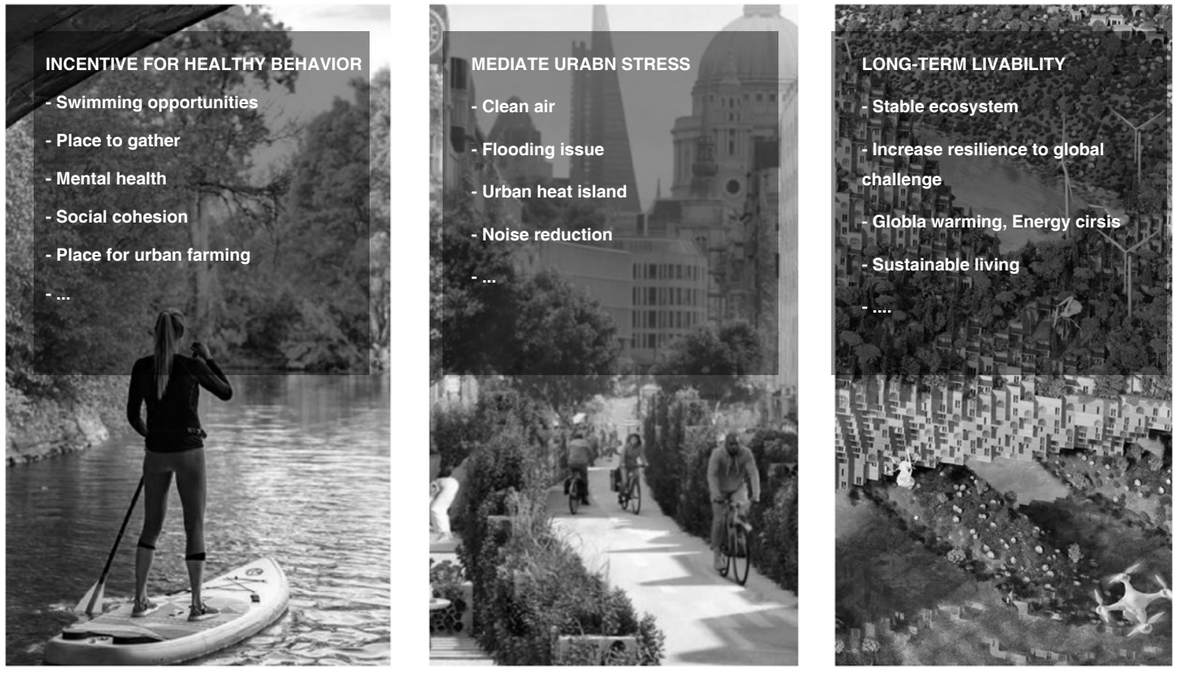


1.3.2 What are Nature-based (NBS) solutions

International Union for Conservation of Nature, Nature-based solutions is defined as:' Actions to protect, manage and restore natural or modified ecosystems, which address societal challenges, effectively and adaptively, proving human well-being and biodiversity benefits ' (Informing the Global Standard for Nature-Based Solutions, 2019).

Pic1.3.2.1 Conceptual framework on Nature-based solutions

Sorce:Photo from IUCN (https://www.iucn.org/news/ecosystem-management/201901/informing-global-standard-nature-based-solutions)

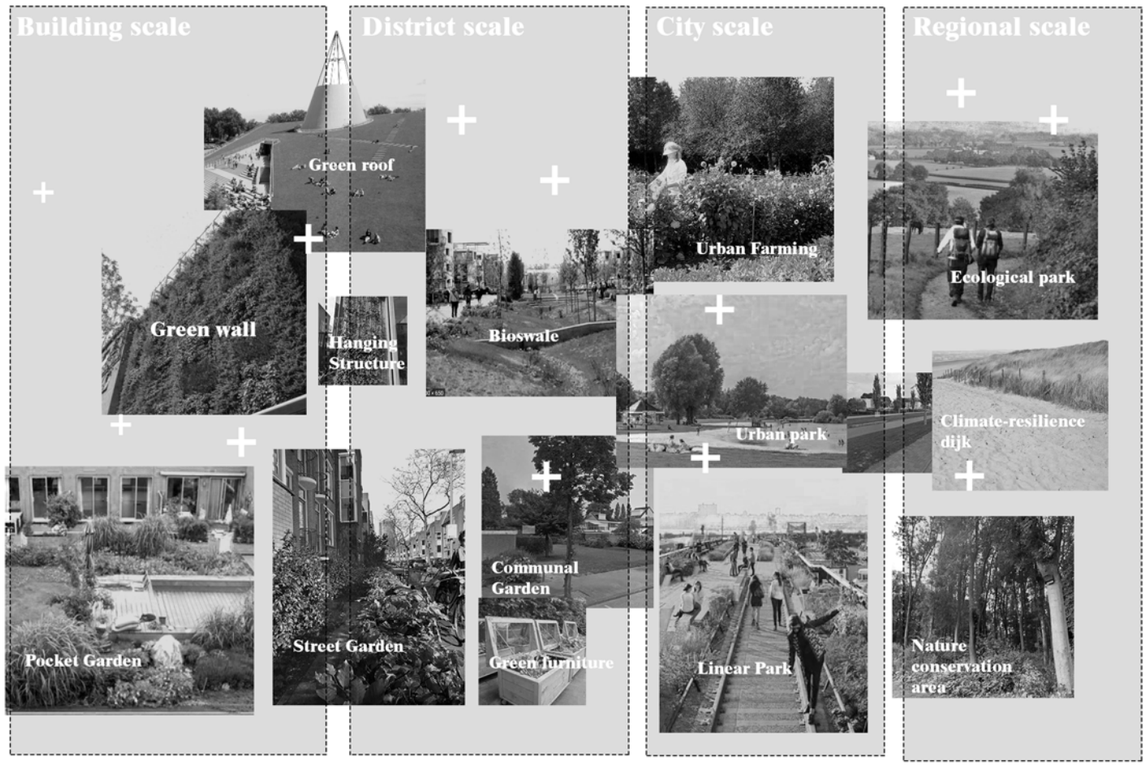
** societal challenges :*
Climate change, natural disasters, social and economic development, human health, food security, water security, ecosystem degradation and biodiversity loss.

Currently,nature-based solutions (NBS) have been developed to bring together ecosystem-based approaches such as 'ecosystem services', 'green adaptation', 'ecological infrastructure', and 'nature-inclusive design' to address a range of environmental and societal challenges (Bush & Doyon, 2019; Li et al., 2017; Voskamp & Van de Ven, 2015) (pic .1.3.2.1).

In the case of Nature-based solutions, from small scales, they are, for example, pocket gardens, green roofs, street trees, green walls, water square, bioswale, urban farms, communal gardens, etc. From a city scale, they are examples like an urban park, Green corridor, tidal park, nature-inclusive canal, etc. Besides a regional scale, they are examples like nature conservation areas, ecological corridor, etc (Pic 1.3.2.2).

Pic.1.3.2.2 Examples of Nature-based solutions in different scales

Sorce: Illustrated by author,

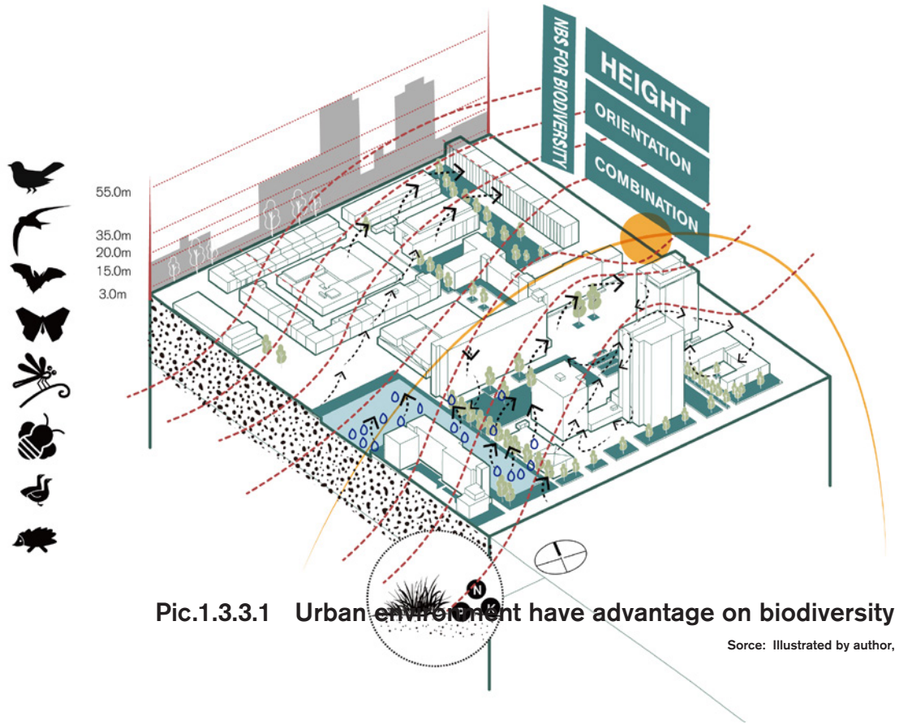


1.3.3 The importance of rich biodiversity of Urban nature

Nature provides us with a wealth of ecosystem services , such as oxygen production, plant pollination, water purification, pest control, etc. These are called ecosystem services. And biodiversity is the basis for the stable functioning of these systems. A high level of biodiversity increases the effectiveness of ecosystems, i.e. water purification, food production, carbon capture, etc., and pest resistance. Therefore an urban environment rich in biodiversity is important for human health and urban well-being.

The number of animal and plant species has declined significantly in recent decades, both worldwide and within the Netherlands (Working Together on Rich Rotterdam Urban Nature, 2020).
Urban biodiversity has a wealth of benefits in terms of enhanced ecosystem function, human heart health, and well-being. "Without biodiversity, there is no life"(Working Together on Rich Rotterdam Urban Nature, 2020).The decline in urban biodiversity is partly due to rapid urbanization, monoculture plant species in cities, and climate change.

On the other hand, the urban environment provides good conditions for the development of biodiversity (Pic.1.3.3.1). This is due to the different microclimates of the cities, the differences in humidity and temperature due to the height differences of the diverse habitats, the abundance of food for fauna, and the lack of predators (Biodiversity,2021)



Pic.1.3.3.1 Urban environment have advantage on biodiversity

Sorce: Illustrated by author,

1.3.4 Why address social engagement in NBS and Urban nature?

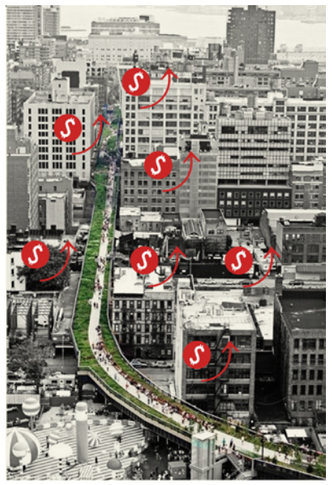
Nature-based solutions are integrated approaches associating with multi-disciplines in different processes (Back, 2020). To ensure NBS be implemented successfully, political challenges, practical challenges, and operational challenges (Back, 2020) need to be addressed simultaneously, thus a wide range of actor groups need to be involved (Raymond & al, 2017; Vujcic et al., 2017).

Promote social justice:

Some green infrastructure in these cases lacking social engagement has instead become a catalyst for social differentiation and geographical segregation, and an impediment to more equal quality urban liveability.

Pic.1.3.4.1 Example of Eco-gentrification

Sorce: edit by author,
data based on Eco-gentrification and who benefits from urban green amentities.



For example, the High Line Park was once an abandoned railway that ran over the Chelsea district of New York City, facing the fate of being demolished. Now it has become a well-known attraction, and it has also brought about a huge gentrification effect (Black & Richads,2020) and its user population has also undergone significant changes. Housing prices around the High Line Park have increased significantly, which has led to the gradual marginalization of old residents(Pic 1.3.4.1). Another example, for some areas, the construction of a parking square may be more influential impaction urban livability comparing with ecological infrastructure. Part of the reason for these problems is the lack of community participation in planning and design, which has led to a certain exclusivity and lack of a sense of belonging by ignoring the green space needs of existing residents.

Increase political capacity :

Moreover, whether nature in cities can positively contribute to urban livability also depends on the quality of ecological infrastructures themselves. It is intertwined with the political, social, and economic culture of the region and is largely limited by the capacity of the landscape sector.

Cope with operational challenges:

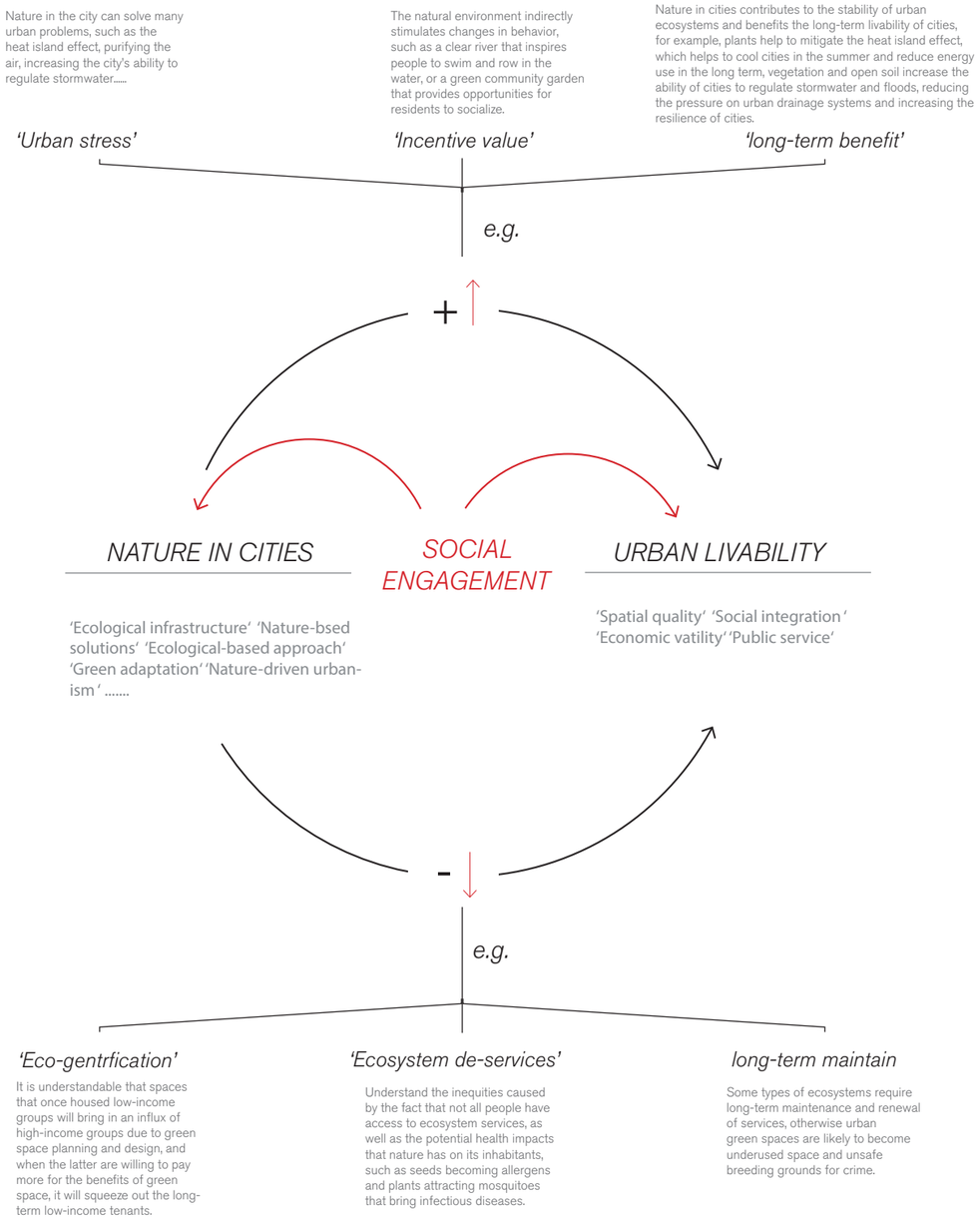
There are operational challenges such as split responsibilities between public sectors such as decision-makers, local authorities, private sectors such as entrepreneurs, and residence or other groups like academics (Back, 2020). In response to these 'operational boundaries', a holistic participation platform or framework is needed. It is stated by Raymond and al (2017) A comprehensive team from multi-disciplinary teams and multi-stakeholder groups with expertise, funds, interest, and design need to be involved to ensure the specific actions in the implementation of NBS.

Upscaling and innovative developments:

"Nature-based solutions are also been seen as an open innovation" (Raymond & al, 2017), the mainstreaming and scaling up of which require a societal paradigm shift and engagement.

Conceptual framework of NBS , social engagement and urban livability

Sorce: Illustrated by author, data based on literature review.



1.4 Research Context

Rotterdam City:

The context of research and design is positioned at the urban scale in Rotterdam, one of the greenest cities in the Netherlands (Gemeente Rotterdam,2010). The City of Rotterdam is one of the most densely populated areas in the Netherlands with a total population of approximately 650,000 in 2020 (Wikipedia contributors, 2020). At the same time, Rotterdam is also the lowest delta in Europe and faces climate uncertainties and pressures (Frantzekaki & Tilie,2014). Rotterdam is also one of the greenest cities in the Netherlands. There are more than one hundred public parks, over 747,000 trees and 19.7% of the total surface area of the city is green. (Gemeente Rotterdam 2010).

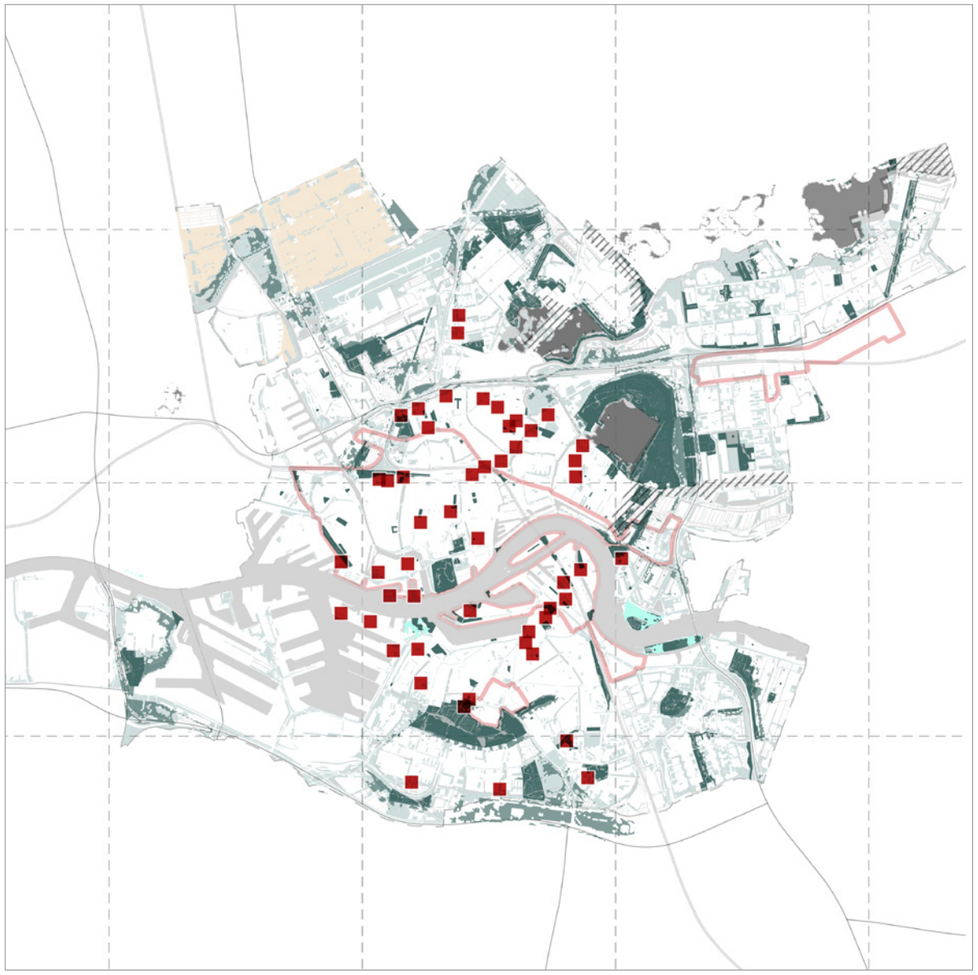
Over the past, decade or so hundreds of public participation green projects have been underway in a variety of forms, from urban farms, community gardens, rooftop gardens, neighborhood gardens, and more. In the coming years, the city of Rotterdam will strive to build more high-quality greenery with due attention to biodiversity and continue to encourage such bottom-up green projects. A large number of existing case studies can be used not only to summarize existing trends and models for green projects in Rotterdam but also to provide a reference for designing intervention areas.

Despite the many green initiatives in Rotterdam, biodiversity is still new to many people. Only 40% of Rotterdam's surface is municipal land, but the flora and fauna do not distinguish between public and private areas, so the more Rotterdammers embrace nature, the more private space can contribute to the city's biodiversity.

Pic1.4.1 Map of Green initiatives in Rotterdam

Sorce: Illustrated by author,
data based data from Natuurkaart Rotterdam; Gemeente Rotterdam,2020 and Urban Nature map Rotterdam

This map shows the way nature has developed, from the core area of Rotterdam and the regional connections between it, to the Rotterdam objectives and the pearls of today , as well as the current green innatiatives projects' location.



Large gardens: privately managed gardens that contribute to the ecological structure of the
Tidal river
Puddle: large water surfaces with spacious banks.
Recreational areas that have great significance for the ecological structure of the city.
Polder with nature management: polders/meadows where Natuurmonumenten cooperates with local farmers.
Green neighborhood intersection: based on the potential connections map.
Green initiative projects before 2016

N

0 1 2km

Improve Biodiversity is an urban agenda for Rotterdam city:

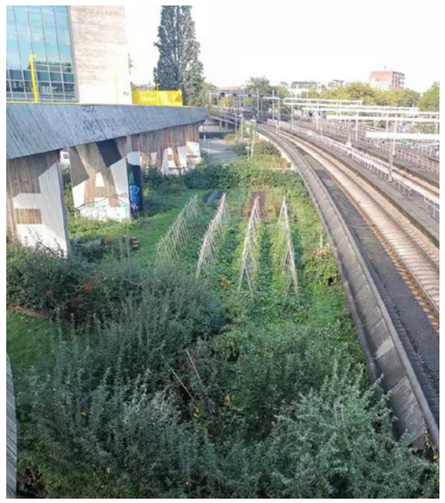
The city of Rotterdam is working together with the citizens of Rotterdam and other groups such as the animal welfare committee and city nature, Rijkswaterstaat, Port authority, citizen representative groups, etc (Working Together on Rich Rotterdam Urban Nature, 2021b). for the ecological diversity of the city. They are working to connect the city's blue-green network more intelligently and to provide the city with more water storage, recreation, and nature. To increase the biodiversity and connectivity of Biopolis with dune, delta, and the nearby polder area as much as possible.

Rotterdam needs social participation if wants to promote a nature-inclusive city:

Despite the many private moves that have been made in cities, biodiversity is still new to most people. In addition, only 40 percent of Rotterdam's land is municipally owned (Working Together on Rich Rotterdam Urban Nature, 2021b), while the rest is occupied by various private holders, but the migration of creatures and the growth of plants does not distinguish between private and public land. So the more Rotterdamemers embrace nature, the more private land has the opportunity to be transformed into an ecological stepping stone, and the more nature-inclusive city Rotterdam will become.

Pic1.4.2 Green initiatives in Rotterdam

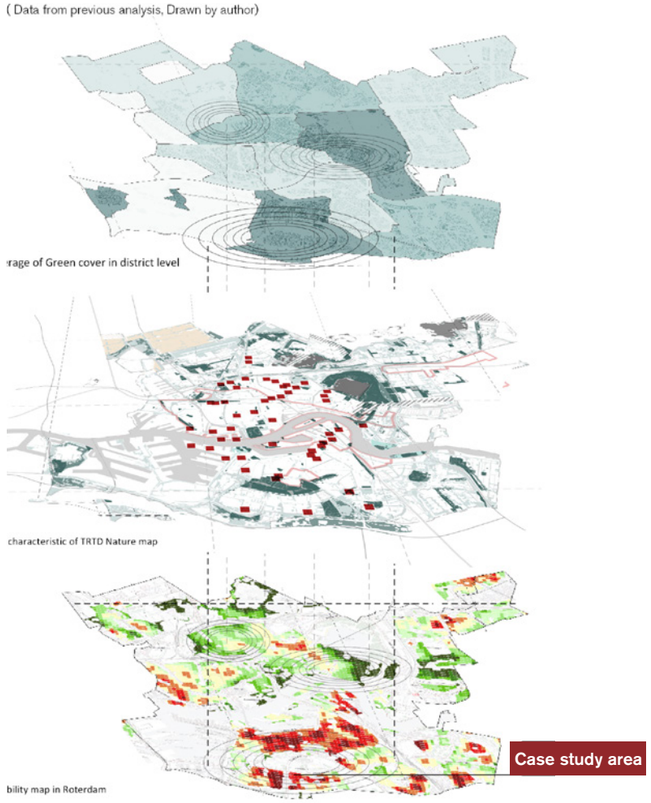
photo by author



1.5 Case study area

Pendrecht district in Rotterdam-Zuid was choose as case stduy area for 3 reasons:

1. At this stage there are fewer green initiative projects for participation comparing to North (pic.1.5.1).
2. The site has a rich green potential - a relatively high average green space rate, the largest urban-level park (Zuiderpark) in the Netherlands, and other green bases .(Pic.1.5.2)
3. From a public perspective it is seen as a less liveable area, facing problems of social isolation and spatial degradation (Pic1.5.3).



Pic1.5.1 Average Green Cover in Rotterdam

Sorce: Illustrated by author,
Data from GIS map of ecosystem services totals at district level which is deposited in Dryad Digital Repository ((Derkzen, Van Teeffelen & Verburg 2015)

Pic.1.5.2 Green structure initiatives

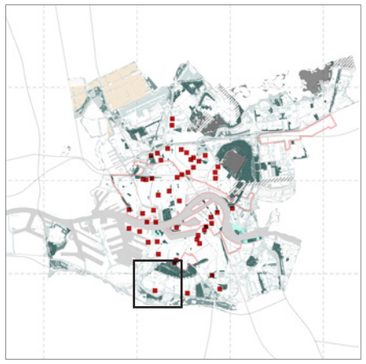
Sorce: Illustrated by author,
data based data from Natuurkaart Rotterdam; Gemeente Rotterdam,2020 and Urban Nature map Rotterdam

Pic.1.5.3 Urban Livability Map

Sorce: Data from : http://www.leefbaarometer.nl

1.5.4 Case study area location

Sorce: Illustrated by author,
data based data from Natuurkaart Rotterdam; Gemeente Rotterdam,2020



1.5.5 Pendrecht Neighborhood boundary

Sorce: Illustrated by author,
data based on google map

1.5.6 City block

Sorce: Illustrated by author,
data based on google map

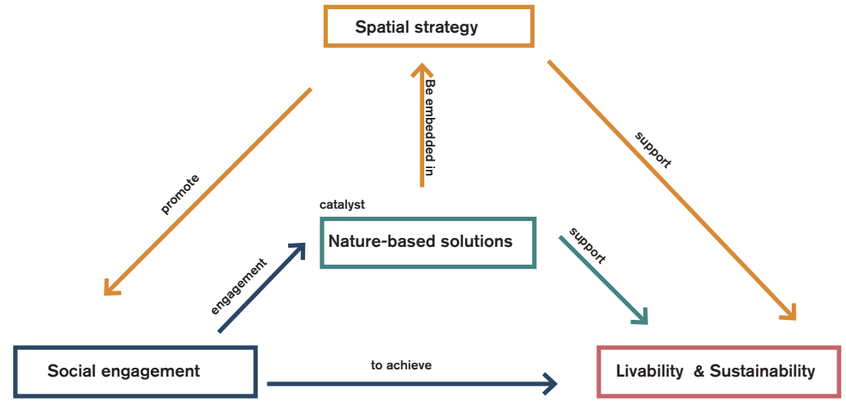
1.5.7 Community district

Sorce: Illustrated by author,
data based on google map

1.6 Research Question

How can spatial strategies promote wider and more autonomous engagement of social parties in nature-based solutions to improve urban livability and support sustainable living in the city?

1.7 Research objective



1.7.1 Ressearch framework

Sorce: Illustrated by author,

The project proposes a spatial strategy from the perspective of urban planning, urban design, and urban development strategies to create a participatory city with good landscapes, encouraging more private groups to participate in the maintenance of urban landscapes and the application of NBS.

In this program, NBS is seen as a catalyst that not only motivates people to participate in transforming their own residential landscape, but also activates the availability of space, shifts urban problems, enhances biodiversity, and brings new opportunities for urban development and transformation.

CHAPTER 2
METHODOLOGY

This section focuses on the main methods applied in project research, as well as answering the specific methods used in each sub-research. The project is also based on an understanding of the corresponding theories on, for example, urban liveability and transformative place-making.

- 2.1 Research methodology
- 2.2 Research framework
- 2.3 Research approach
- 2.4 research methods
- 2.5 Theoretical base

2.1 Research methodology

The project proposes a spatial strategy from the perspective of urban planning, urban design, and urban development strategies to create a participatory city with good landscapes, encouraging more private groups to participate in the maintenance of urban landscapes and the application of NBS.

In this program, NBS is seen as a catalyst that not only motivates people to participate in transforming their residential landscape, but also activates the availability of space, shifts urban problems, enhances biodiversity, and brings new opportunities for urban development and transformation.

How can spatial strategies promote wider and more autonomous engagement of social parties in nature-based solutions to improve urban livability and support sustainable living in the city?

Sub-Rq 1: How do planning and design strategies integrate the building with the natural concept?

Sub-Rq 2: How to understand the complexity of social participation in NBS?

Sub-Rq 3: What kind of stakeholder groups are involved in the project ?

Sub-Rq 4: What are the planning strategies that respond to participation gaps?

Sub-Rq 5: How the strategies are reflected in the planning and design?

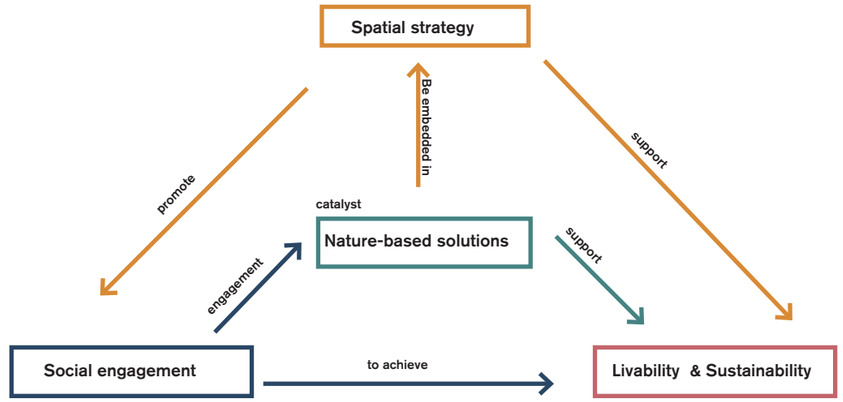
Sub-Rq 6: How to ensure the effective operation of your project?

2.2 Research framework

Sub-Rq 1: How do planning and design strategies integrate the building with the natural concept?

Sub-Rq 4: What are the planning strategies that respond to participation gaps?

Sub-Rq 5: How the strategies are reflected in the planning and design?



Sub-Rq 2: How to understand the complexity of social participation in NBS?

Sub-Rq 3: What kind of stakeholder groups are involved in the project ?

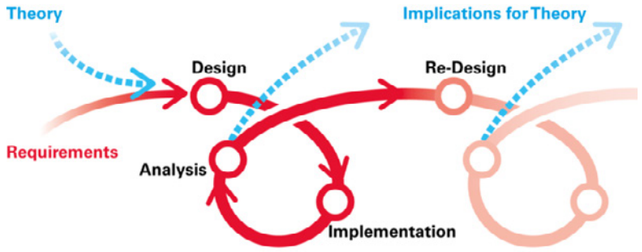
Sub-Rq 6: How to ensure the long-term operation of the project?

2.3 Research approach

Design studies and mixed methods are the two overall approaches to be applied in this thesis project. Both methods will be described in more detail below.

Plc 2.3.1 Design based research as an ongoing process

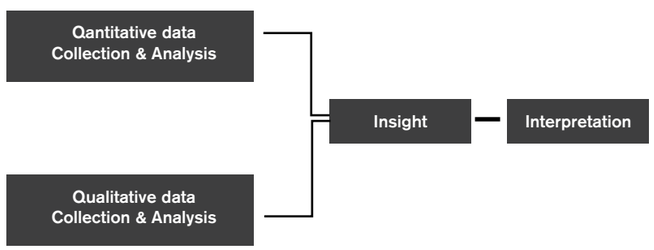
Sorce: Ilustrated by Fraefel (2014) , Fraefel,. Professionalization of pre-service teachers through university-school partnerships. In Conference Proceedings of WERA Focal Meeting, Edinburgh.



The design-based research approach is a continuous process of innovation and revision, where design is not the end product but a tool to stimulate research results. Research and design contribute to each other's continuous development.

2.3.2 Mixed Methos __ Dynamic Research approach

Sorce: Illustrated by Author.

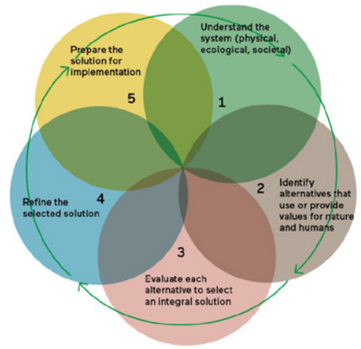


Mixed methods refer to the integration of qualitative and quantitative methods in a single study in order to gain a more comprehensive understanding of the issues under study. For this project for example, for the NBS project the difficulties of participation, etc. need grey data through interviews, cases, etc., for the design of specific programs, more accurate mapping, etc. techniques need to be supported by quantitative data.

2.4 Research methods

Sub-Rq1 **How do planning and design strategies integrate the building with the natural concept?**

How to effectively implement participatory strategies and apply NBS to different site contexts, here I will use the five building with nature design steps.



This is a circular and flexible solution, where each stage can be completely independent of the others and does not necessarily follow a sequence.

2.4.1 Five basic steps for generating Building with Nature ideas

Sorce: Bouw, M., & Eekelen, V. E. (2021). Building with Nature: Creating, Implementing and Upscaling Nature-Based Solutions. nai010 publishers.

step 1 : System understanding

An in-depth understanding of the physical systems (biotic and abiotic) as well as the socio-economic systems and governance environment is essential to identify potential win-win solutions.

methods -Define the main objectives of the project

Mapping ,sketches, case study , literature review, interview

step 2 :Identify viable alternatives

How to maximize local potential and develop flexible and robust alternatives

- Consider how projects can bring benefits to larger-scale ecosystems and how small-scale ecosystem services can be enhanced to bring vitality to ecology, recreation, and landscapes
- How to better utilize the availability of local resources such as plants, economy, culture, sedimentation, etc.

methods - How to use time to realize design concepts step by step

- Mapping ,sketches, case study , Design exploration

step 3 :Evaluate and integrate

methods Evaluate the intrinsic quality of the alternatives and combine them into an optimal solution.

Scenario making , sketches

This project does not involve

step 4 : Refine the select solutions

Elaborate the story , consider about the Solution availability, equipment availability, scheduling, etc.

methods Sketching , mapping, case study

step 5 : Prepare for implementation

The program considers the specific implementation of the project, technical aspects, own aspects, participant aspects, risk and contingency aspects

methods Sketching , mapping, case study

Sub-Rq2

Sub-Rq 2: What are the planning strategies that respond to participation gaps?

methods Deisgn exploration, Case study , sketching

Sub-Rq3

Sub-Rq 3:How the strategies are reflected in the planning and design?

methods Deisgn exploration, Case study , sketching

Sub-Rq4

Sub-Rq 4: How to understand the complexity of socia participatio in the NBS

methods Literature review, case study , interview

Sub-Rq5

What kind of stakeholder groups are involved in the project?

Reason To understand the pattens for participating in NBS and and systematicaly understanding of the dimensions that prevent society from participating in NBS in order to develop subsequent strategies to address them

- How to understand participatory gaps in the urban landscape?

methods LIterature review, Documentary , Case study , interview with stakeholders

- What are the stakeholder groups get involved in urban landscape

To understand the Landscape management roles in the city and discovering the potential

methods LIterature review, Documentary , Case study , interview with stakeholders

- What the challenges they meet?

To understand the Landscape management roles in the city and discovering the potential

Sub-Rq6

Sub-Rq 6: How to ensure the long-term operation of the project?

methods Reflection on the design result

2.5 Theoretical base

2.5.1 Urban livability

Urban livability is the sum of various factors that constitute the quality of life in cities (Bush & Doyon, 2019; Kashef, 2016). Researchers have shown numerous factors for urban livability crossing disciplinary and professional boundaries, ranging from physical aspects like built environment and natural environment; social aspects like social stability, equity, and the possibility of culture, entertainment, and leisure; economic aspects like economic prosperity and affordable housing (Kashef, 2016). All of these directly or indirectly impact settlements' health and quality of life. In urban planning and design discourses, many researchers address the environmental aspects and quality of public space relating to urban livability (Kashef, 2016). With the theoretical understanding of cities as 'complex systems' (Mitchell, 2009) the performance of social and economic components can be improved by physically setting (Kashef, 2016; Valcárcel-Aguiar, Murias, & Rodríguez-González, 2019). Besides, public spaces are key roles in this setting. For the reason that public spaces are the foundation and content of urban public life (Keleg, Salheen, & Latif, 2015). It is also believed that public spaces are good arenas for government, the private sector, and citizens for creativity and collaboration which give opportunities for vibrant and inclusive urban environments (Investing in Public Spaces to Achieve Livable Cities for All, 2020) Thus, the quality which always is seen as one of the tools for achieving urban livability.

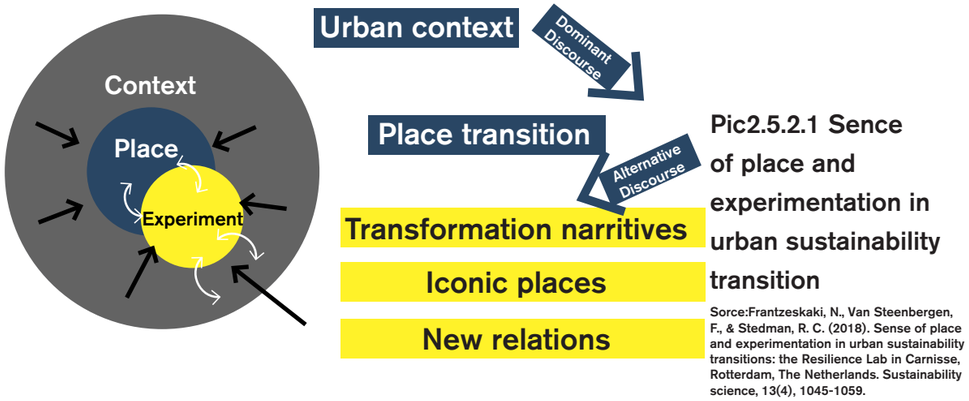
The most recent planning and design discourse of urban livability applied to a long-term perspective encompassing the concept alongside 'sustainability' and 'Resilience ' with emphasizing the importance of natural environments in cities (Kashef, 2016; Valcárcel-Aguiar et al., 2019).For the reason that the cities with their industrial, commercial, transportation, and residential functions imposing physical components over the natural terrain (Kashef, 2016). These components consume non-renewable energy and emit different kinds of pollutants that affect the stability of ecological systems and natural biodiversity (Gough, 2015). To maintain livability for future generations, cities urgently called for environmental sustainability (Godschalk, 2004). A series of theories were developed to understanding urban systems and to minimize the adverse impact of cities on the environment (Kashef, 2016; Sijmons, 2020). Such as, 'System approach', 'Layered system' and 'Urban metabolism'.

In conclusion, environmental aspects are important factors for urban livability, in which the public spaces be highlighted. Moreover, contemporary urban livability addresses the long-term perspective and is framed with sustainability and resilience. Economic, social, and psychological aspects of urban livability can be seen as by-products of spatial arrangements.

2.5.2 A transitional perspective

When trying to understand broader social participation as a transition, the project draws on transition theory (Grin et al, 2013), which has been developed in the Netherlands and European countries over the last decade or so, and which examines processes that refer to change in a specific time and space.

The transformation needs to be based on the principles of a sustainable transformation in order to promote wider participation of the community, facilitate the upgrading and expansion of the NBS, and reverse urban decay. Sustainable transformation refers to "radical transformation towards a sustainable society, as a response to a number of persistent problems confronting contemporary modern societies" (Grin et al 2010)." Sustainable transformation is thus understood as an approach to social governance that aims to facilitate accelerated sustainable transitions through participatory processes of visioning, learning, and experimentation (Scribbr, 2021).

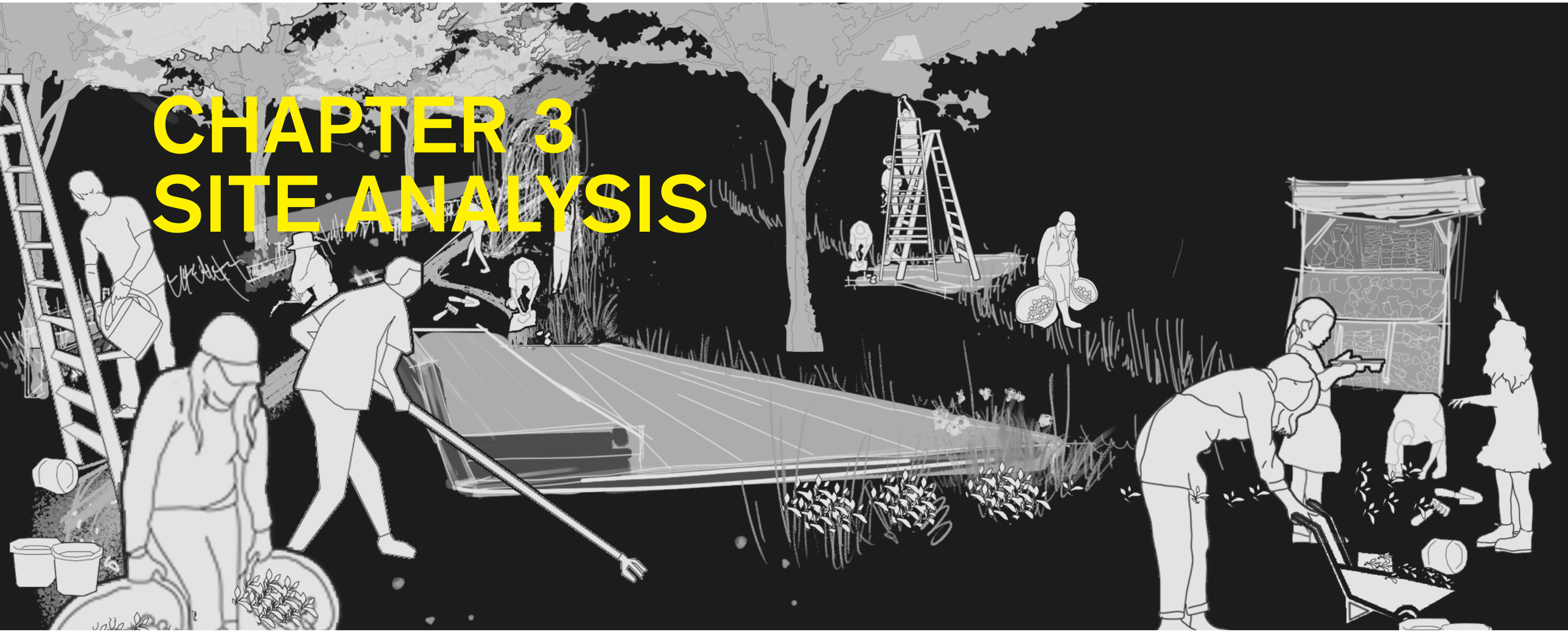


Pic2.5.2.1 Sence of place and experimentation in urban sustainability transition

Sorce:Frantzeskaki, N., Van Steenbergen, F., & Stedman, R. C. (2018). Sense of place and experimentation in urban sustainability transitions: the Resilience Lab in Carnisse, Rotterdam, The Netherlands. Sustainability science, 13(4), 1045-1059.

Frantzeskaki et al. (2018) state that the emphasis on the role of citizens' more active participation in addressing and solving problems in the context in which they live facilitates the shaping of a sense of place, which can be the result of experiments that promote sustainable transitions, and a sense of place is also consistent with the concept of place embeddedness in the context of transforming re-social spaces (Pic 2.3.2.1). And the paper summarises three key phenomena based on the transformation of a sense of place: 'New relations between people and place and between people in the place' 'A narrative of place that connects to a transformative vision' 'A symbolic understanding of place'(Frantzeskaki et al,2018).The project is based on this theoretical foundation to develop urban strategies for sustainable transformation.

CHAPTER 3
SITE ANALYSIS



Sub-Rq1 **How do planning and design strategies integrate the building with the natural concept?**

According to section 2.3, before generating a spatial strategy, the project needs to multiply a systematic understanding of the site (landscape, space, ecology, social services, etc.) The project needs to assess the possible potential based on the results of the analysis and form pre-design ideas.

3.1 Site analysis

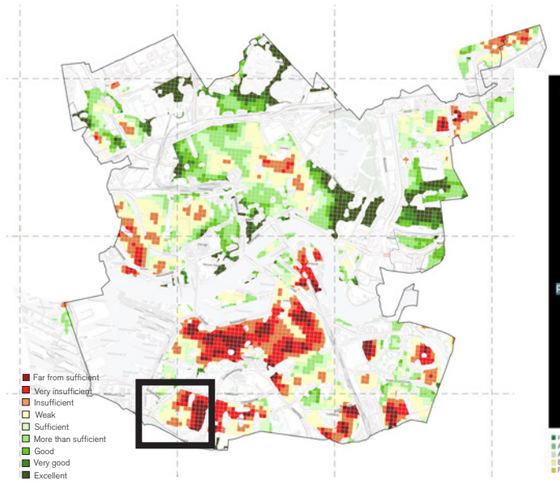
3.1.1 Social condition

Poor livability perception

Pendrecht is a neighborhood in Rotterdam-Zuid. with 12,390 inhabitants in 2019 (Lots of Information about Neighbourhood Pendrecht, 2021). This area accommodates a high number of residents with low household income or receiving social assistance. The livability survey also reveals that this area reflects poor life satisfaction(Pic 3.1.2 & Pic 3.1.3). Unwelcome public spaces leave a large amount of green space in the neighborhood unused, and high crime rates put a lot of pressure on people's confidence in the safety and quality of life in the neighborhood. In addition, cities are facing external pressures from urban ecology, densification, sustainability, and other transformations (Pic 3.1.1).

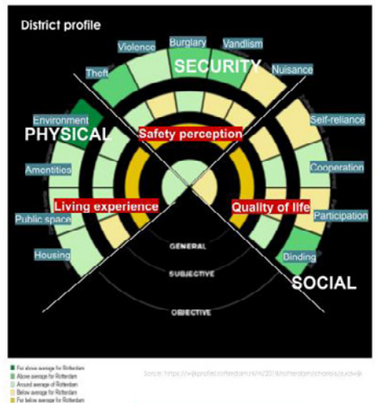
Pic. 3.1.2 Livability Map of Case study area

Sorce: Data from : http://www.leefbaarometer.nl , edit by author



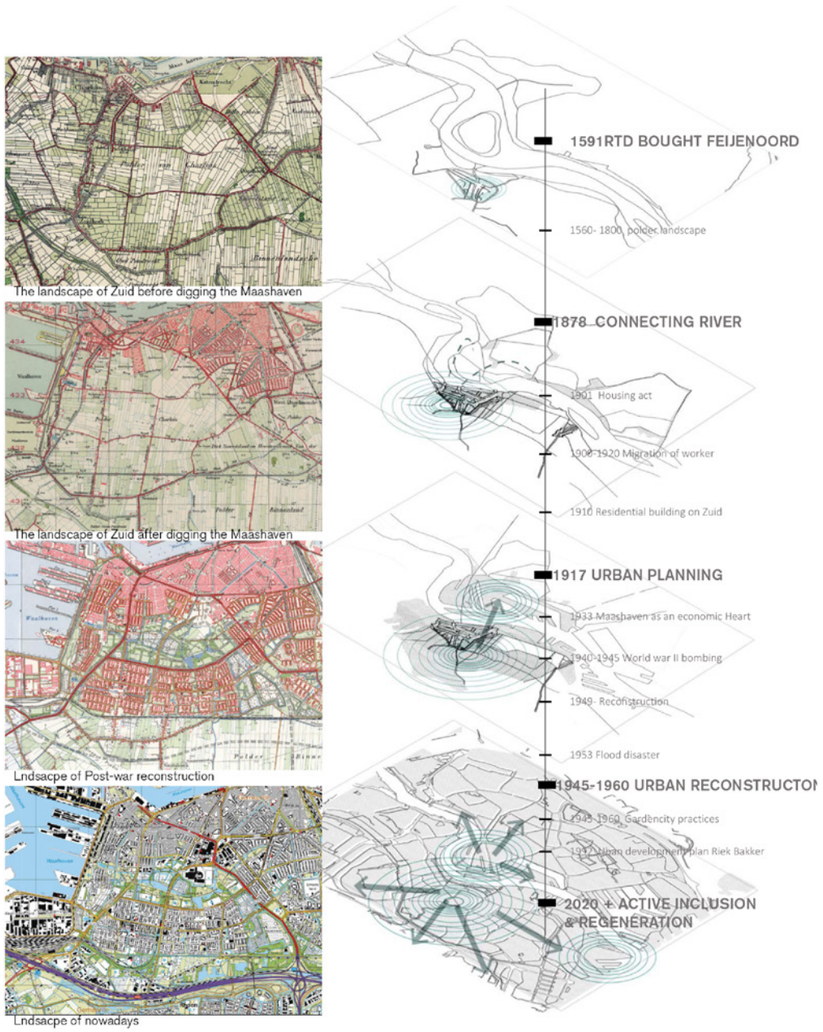
Pic3.1.1.3 District profile Pendrecht

Sorce: https://wijkprofiel.rotterdam.nl/nl/2018/rotterdam/charlois/zuidwijk



3.1.2 Landscape development

Pendrecht neighborhood was built in the 1950s in the open fields south of Rotterdam (Pic.3.1.2.1), where there was a severe housing shortage due to the devastation of the war and the population explosion caused by the post-war baby boom.



Pic. 3.2.1.1 Historical Develop Map

Sorce: illustated by author
data source:Data from Rotterdam Open Data, http://rotterdamopendata.nl/dataset. Drawn by author.)

3.1.3 Urban plan philosophy

The post-war reconstruction is based on a modernist neighborhood concept (Pic.3.1.3.1) and the plan was made. In this concept, the city is made up of neighborhoods, districts, and urban areas. Each neighborhood had social facilities such as schools, churches, and supermarkets, and there were extensive green belts and public green spaces between the neighborhoods and communities, which at the time attracted a large number of middle-class households.

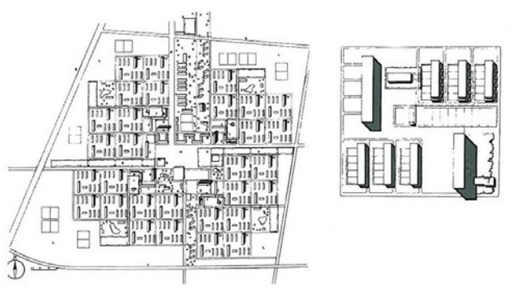
Pic.3.1.3.1
Urban structure 1946

Sorce: Pic from Pendrecht. Cultuurhistorische analyse en beschrijving

https://docplayer.nl/21698440-Pendrecht-cultuurhistorische-analyse-en-beschrijving-1948-1958.html

The ' Neighborhood Concept '

The municipal designer Lotte Stam-Beese designed the urban plan for Pendrecht (1949-1952) in consultation with the modern architects of the Opbouw architectural group (Pic 3.2.2.b). She took the diversity of urban life as her starting point and proposed an urban development structure in which blocks of buildings of two stories high and low are arranged in a compact manner on straight streets. She considered the rustic, garden-style design unsuitable for modern housing production.



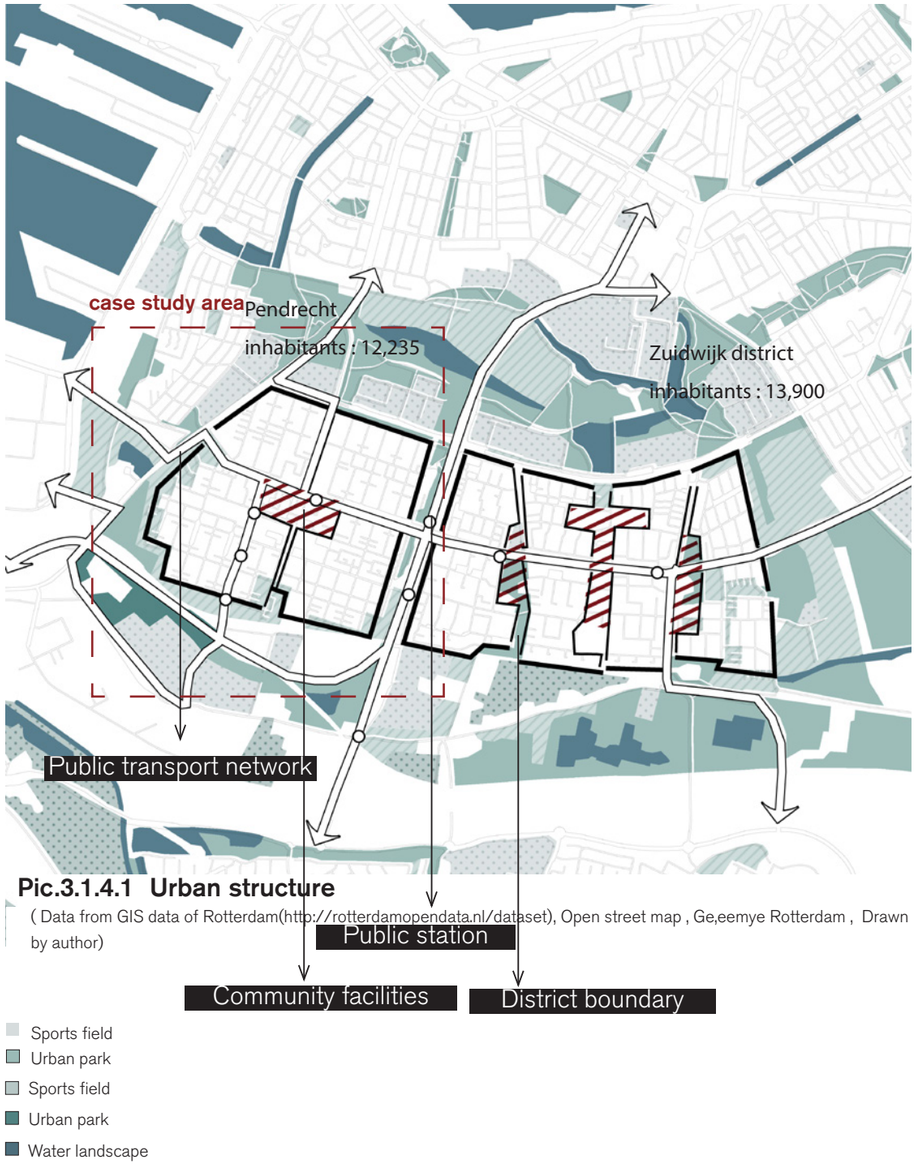
3.2.2.2
Urban design Pendrecht

(1949-1953) by Lotte Stam-Beese

Source: https://www.metalocus.es/en/news/lotte-stam-beese-urban-planner-bauhaus

3.1.4 Urban structure

This urban plan has also influenced the current urban space, The city is made up of neighborhoods, districts, and urban areas. Each neighborhood had social facilities such as schools, churches, and supermarkets, and there were extensive green belts and public green spaces between the neighborhoods and communities (Pic.3.2.3.1).



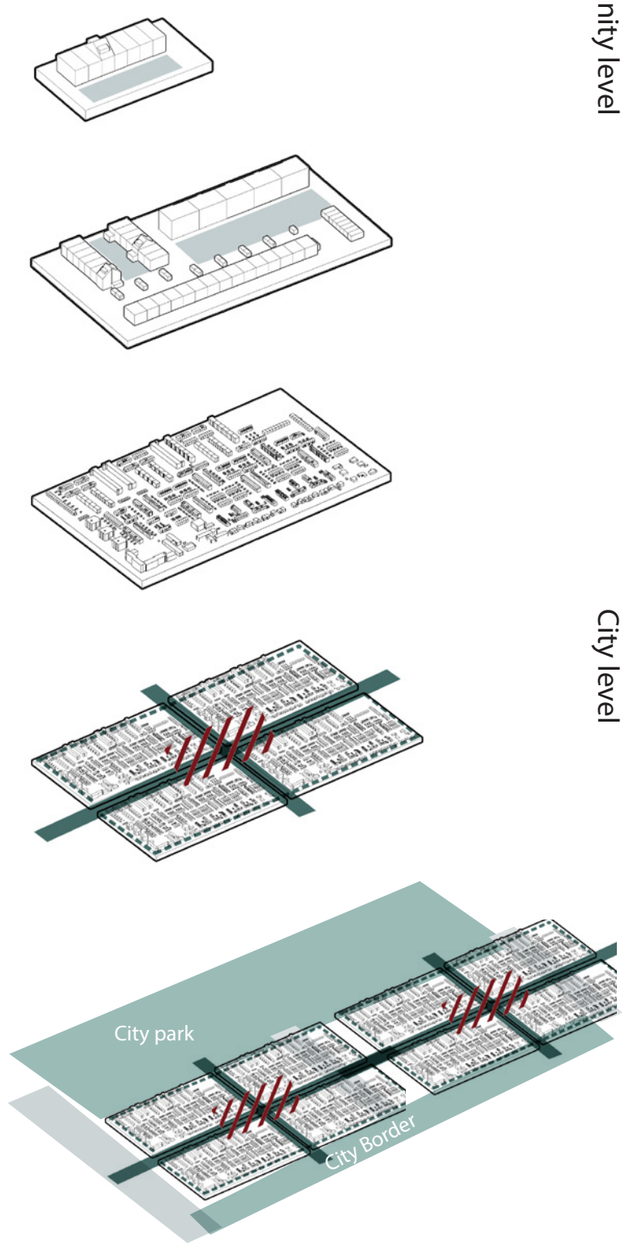
Pic.3.1.4.1 Urban structure

(Data from GIS data of Rotterdam(http://rotterdamopendata.nl/dataset), Open street map , Ge,eemye Rotterdam , Drawn by author)

Community housing mainly consists of the stacked house and ground-level housing. Together, they form the city's blocks. In the building blocks they plenty of collective public space.

Pic1.4.1 City Composition

Source: Illustrated by author, Data from :Rotterdam 3D download

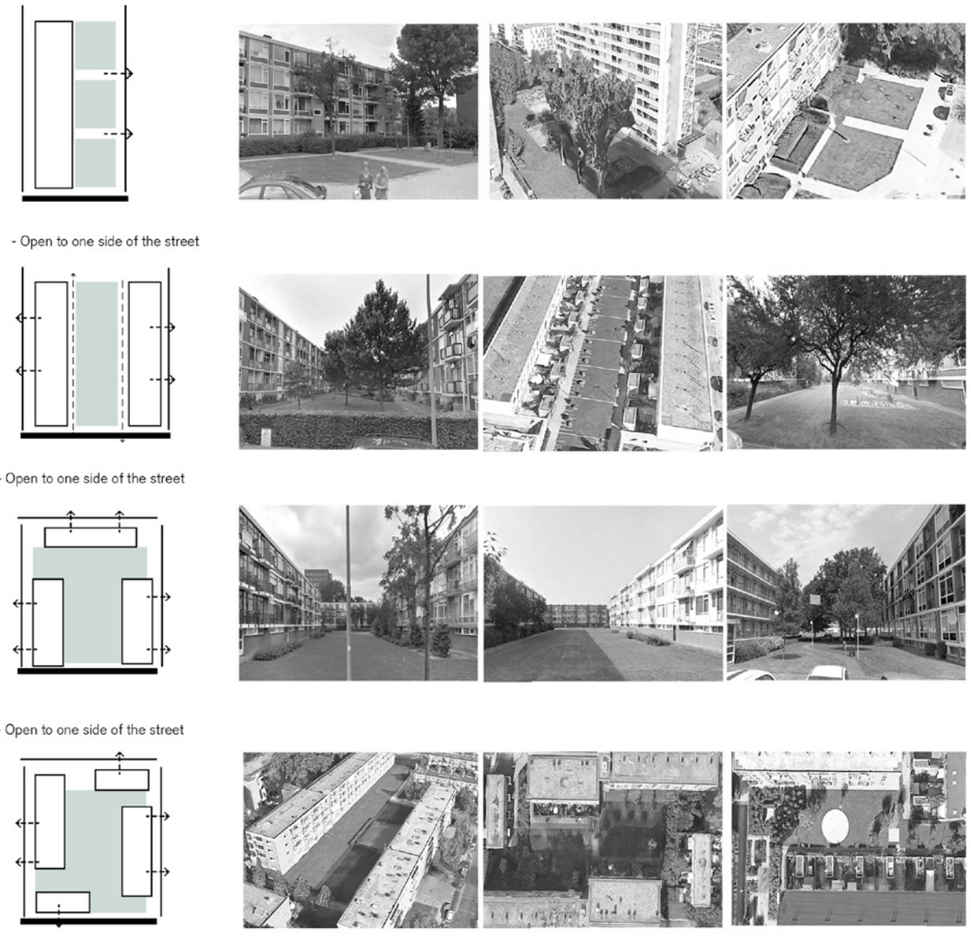


A. Collective yard has great ecological and social potential

Between the communities, there are large areas of grassland (Pic.3.2.3.4) that are largely unused. They are of poor spatial quality, lacking in infrastructure and maintenance, to the extent that few activities take place. Moreover, the vegetation of these green spaces is ecologically homogeneous and lacks a multi-layered structure, with a great potential for untapped biodiversity.

3.2.3.4 Typology of communit Garden

Sorce:Illustrated by author , pics from google street



B. Green spatial structure

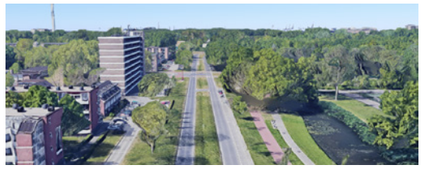
The green spatial structure is closely linked to the city. These green environments include streets, public and private gardens, green connections, etc., whose alternating connections create a continuous impression of green space.

The green structure of the Pendrecht neighborhood is influenced by the traffic structure. But the long and continuous east-west streets do not have continuous street vegetation, in each section the unplanted street section alternates with the planted section. And a very important part of the green structure is between public and private buildings, which makes the ecological situation vary considerably between public and private sites. In many park garden layouts, there are only scattered trees on the grass, which makes the greenery look homogeneous and boring.

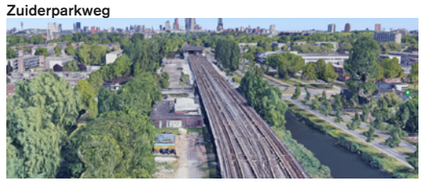
For the study of ecological structures, the main task is to improve the quality of existing green spaces. In the Pendrecht, there is much room for improvement in terms of environmental quality and the recreational and amenity value of outdoor spaces . For example, the greenery along the Groene Kruisweg, the greenery of the Oldegaarde, the harbor railway line, and the Zuiderparkweg are all part of the ecological structure of the city. The green spaces along the route can be transformed into more interesting ecological connection areas.

Pic3.1.4.2 Green structure be influenced by trafffic

(photo from google map)



Zuiderparkweg



Groene kruisweg

Havenspoorpar

C. The quality of the existing green landscape needs to be improved

Surrounding the city, there are also different kinds of urban green spaces. Some exist in the form of urban parks, and they provide places for recreation, sports, and gatherings for community residents.

Strip park connects the natural landscape with the urban landscape and is composed of grassland and street trees, which have limited species diversity and can be renovated. The green space on the south side of the city is mainly composed of farms and factories and other facilities.

Pic.3.14.3 Green surroundings

(Source: photo from google map)

3.1.5 Social & economy structure

The main social services of the neighborhood are concentrated in the square plein 1953 and its surrounding area, such as schools, stores, visits, churches, etc. They form the functional axis of the city.

Pic3.1.5.1Public services structure of Pendrecht

Sorce: Illustrated by author,

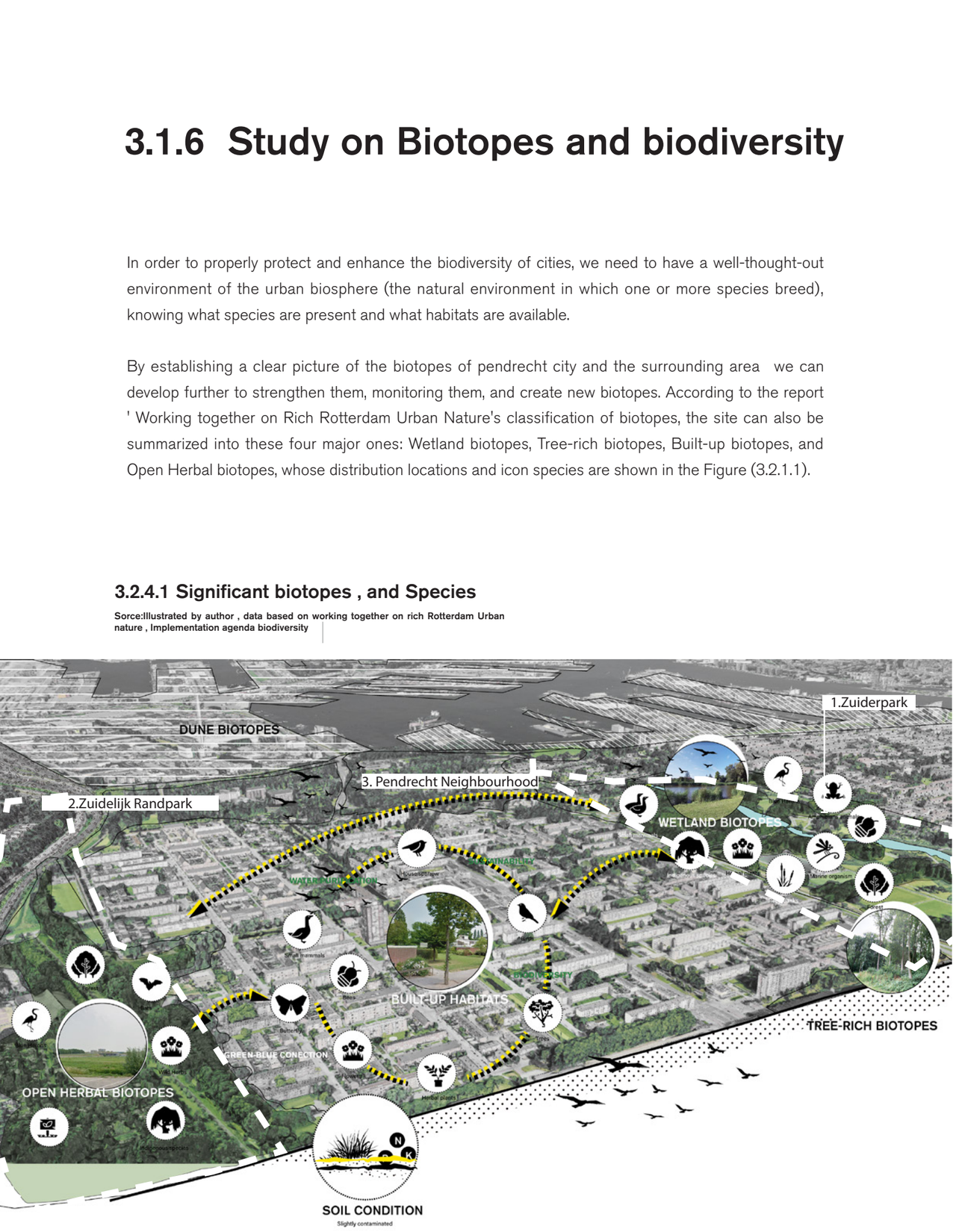
3.1.6 Study on Biotopes and biodiversity

In order to properly protect and enhance the biodiversity of cities, we need to have a well-thought-out environment of the urban biosphere (the natural environment in which one or more species breed), knowing what species are present and what habitats are available.

By establishing a clear picture of the biotopes of pendrecht city and the surrounding area we can develop further to strengthen them, monitoring them, and create new biotopes. According to the report ' Working together on Rich Rotterdam Urban Nature's classification of biotopes, the site can also be summarized into these four major ones: Wetland biotopes, Tree-rich biotopes, Built-up biotopes, and Open Herbal biotopes, whose distribution locations and icon species are shown in the Figure (3.2.1.1).

3.2.4.1 Significant biotopes , and Species

Sorce:Illustrated by author , data based on working together on rich Rotterdam Urban nature , Implementation agenda biodiversity

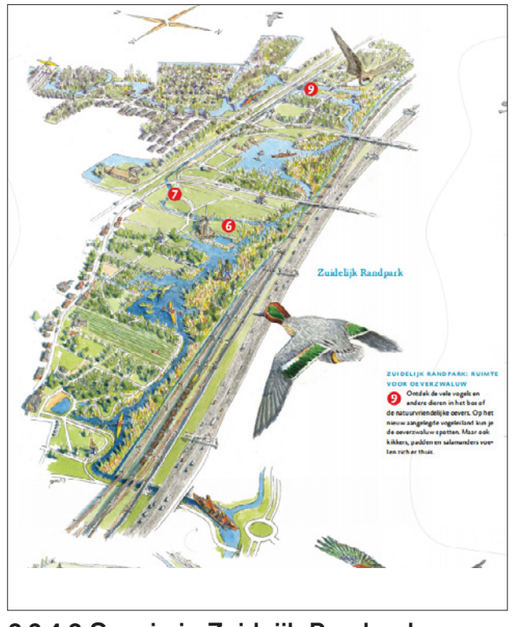


3.2.4.2 Species in Zuiderpark

Sorce:Een waterverbinding tussen het Rotterdamse Zuiderpark en de Zuidpolder van Barendrecht

1.Zuiderpark

According to the website of the ARK Nature Organization, there are various rare plants in the zuiderpark, including wild orchids. A rich variety of animals, such as rabbits, bats, and many species of birds. Predators include, for example, the tawny owl. The park is also rich in water, waterways, ponds and marshes, and around these wetlands live many frogs, toads, and butterflies. (https://www.webwinkel.ark.eu/producten/kaarten/kaart-de-blauwe-verbinding)



3.2.4.3 Specie in Zuideijk Randpark

Sorce:Een waterverbinding tussen het Rotterdamse Zuiderpark en de Zuidpolder van Barendrecht

2.Zuidelijk Randdpark

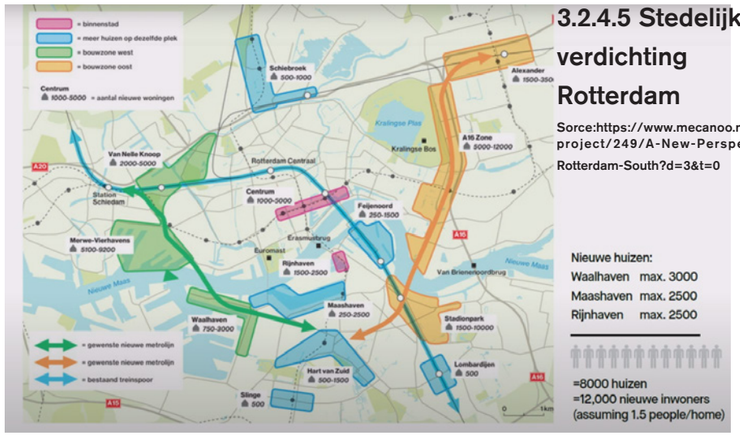
In the pendrecht community south of the edge of the park, many birds and many forest species are also found here. The eco-friendly river banks are also home to frogs, toads and salamanders.

3.1.7 Urban development plan

A. Energy Transition __ Natural gas-free neighborhoods

pendrecht is one of the first communities that the city wants to be gas-free (Gemeente Rotterdam, 2021). The city plans to stop using natural gas and cook and heat with sustainable heat within 10 years, a shift that will not only create new jobs but also create an environmentally friendly, more energy-efficient, and greener city.

B. Densification __ 500 + New housing



3.2.4.5 Stedelijke verdichting Rotterdam

Sorce:https://www.mecanoo.nl/Projects/project/249/A-New-Perspective-for-Rotterdam-South?d=3&t=0

The pendrecht neighborhood, although not central to the city, also faces a certain demand for densification. Its future urban orientation wants to attract more families and seniors and to have at least 500 new homes by 2030. Indeed, new urban developments can remove social and physical barriers in the city, improve access to the environment and services and increase the cohesion of the urban fabric.

3.1.8 Conclusion of challenges

Pic.3.1. Map of the Challenges Pendrecht meet

Sorce:Illustrated by author

3.2 Problem statement

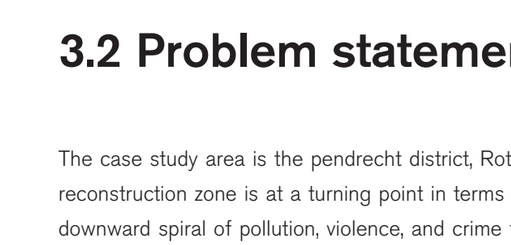
The case study area is the pendrecht district, Rotterdam, which is a city in transition. The post-war reconstruction zone is at a turning point in terms of safety and quality of life, having experienced a downward spiral of pollution, violence, and crime for decades. The cheapest small houses have attracted vulnerable groups. And people with higher incomes have left. Leading to social isolation. People who live here have bad life experiences.

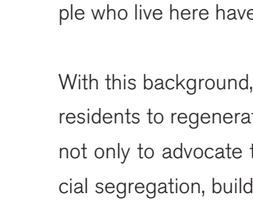
With this background, the project hopes to unlock the great potential in the community and empower residents to regenerate themselves. Therefore, the project hopes to see NBS as a catalyst for space, not only to advocate the public to use NBS to activate the use of public space, but also to fight social segregation, build up the sense of place, increase employment opportunities, attract investment, tourists, and new residents, and together create a more sustainable and livable city(Pic.3.1.2.1).

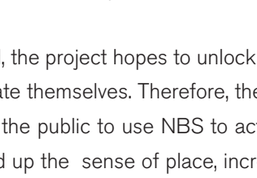
3.2.1 Diagram of spatial activation with NBS

Sorce: Photo by author

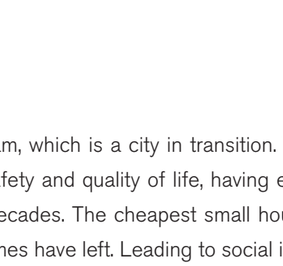
Unused space

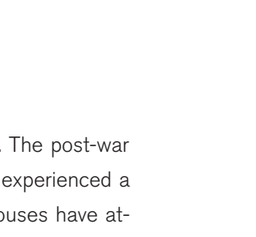


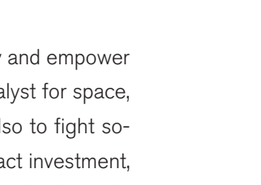




Vibrant & Ecological Diversity space

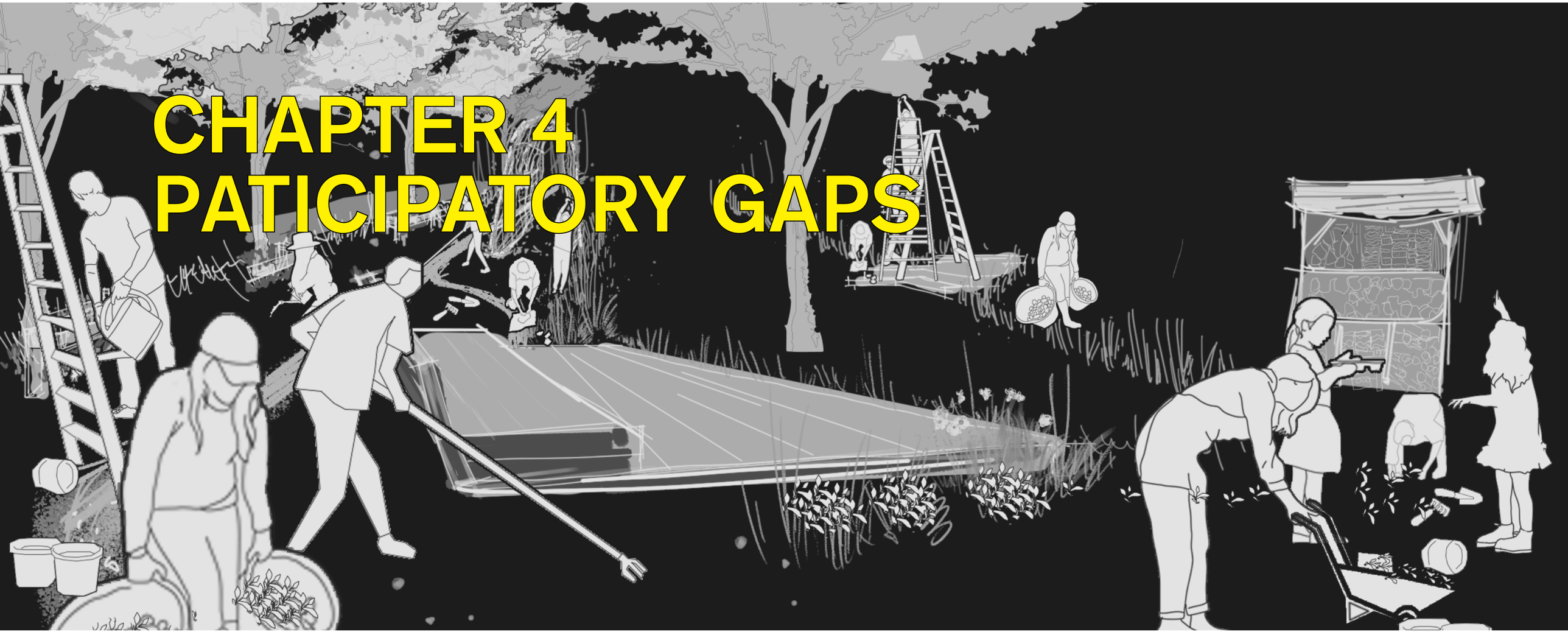






Pic3.2.1 Conceptual framework of how social engagement in NBS shift urban challenges

Sorce: illustated by author



CHAPTER 4
PATICIPATORY GAPS

Sub-Rq2 **Sub-Rq 2: How to understand the complexity of social participation in the NBS ?**

Sub-Rq3 **Sub-Rq 3: What kind of stakeholder groups are involved in the project ?**

This chapter will answer Sub-Rq4 and Sub-Rq 5, in order to provide a research basis for the subsequent spatial strategy generation.

In section 3.1.4, the project mentions that there are a large number of collective yards on the site, which are of poor spatial quality, with a single type of vegetation, a lack of public facilities, and few activities occurring.

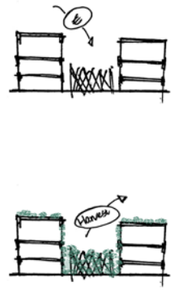
we see the great amout of unused space and strong potential for self-development within communities can be an impotant weapon against urban challenges.
But the question is how can this weapon be activated?

4.1 Challenges for participation in NBS

Although NBS has great potential for solving social challenges (mentioned in chapter 1.3) There are still gaps from knowledge, evidence, and initiative experiments to a wide range of participation, mainstreaming, and scaling up (Bush & Doyon, 2019; Raymond & al, 2017). These participatory gaps come from many perspectives.

Time perspective

Firstly, we need to understand that NBS are ecosystem-based approaches and naturally got ecosystems' characteristics like dynamic and can evolve through time (Bush & Doyon,2019). Thus, the positive outcome induced by NBS may need long-term assessment and monitor (Raymond,2017; Exploring Opportunities for Green Adaptation in Rotterdam,2020) Given these features, leading to the ambiguous vision of the expected outcome (Pic.4.1.1), or initiative excitation which prevent social participation.



Pic 4.1.1
Uncertainty outcome of NBS
Sorce: Illustrated by author,

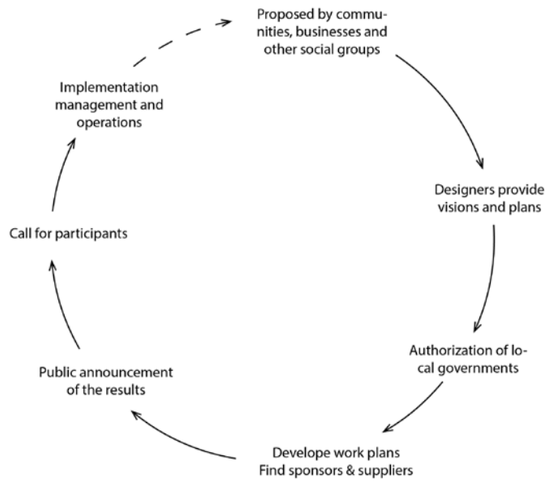
Knowledge gaps

Given that NBS is a multidisciplinary field and called for social participation. The knowledge gaps come from policymakers, urban planners, entrepreneurs, and NBS practitioners with all kinds of scientific backgrounds, and these can be a big barrier to effective communication (Ferreira et al., 2020; Raymond & al, 2017). In addition to this, the public's lack of knowledge about NBS can prevent them from taking the initiative (Pic.4.1.2).

Pic 4.1.2 Example of Knowledge gaps
Sorce: Illustrated by author,

Public trust

Public trust is another important factor for NBS both in launching new projects and maintaining long-term implementation (Nature-Based Solutions: Implications on Design, Planning, Governance and Economics, 2020) especially the maintaining of public trusts. They called for clear actions and long-term implementation schemes as guidance. Otherwise for example, with the dynamic changing social structures in cities (such as changing political parties or community compositions) the previous progress may face the dilemma of starting over and erode the public trust, thus leading to a reduction of public participation.



Pic 4.1.3 The process of community initiative projects in Rotterdam

Sorce: Illustrated by author,

The diagram shows the overall process of a community-initiated project in Rotterdam from conception to completion, reflecting the transparency and openness of governance, which facilitates the development of social trust. On the other hand, the completion of a community project is also subject to multiple processes of approval and publicity, a process that not only requires constant follow-up by personnel, but also has problems in terms of ineffective communication. As planners, we can think of strategies to simplify the process.

Different interest

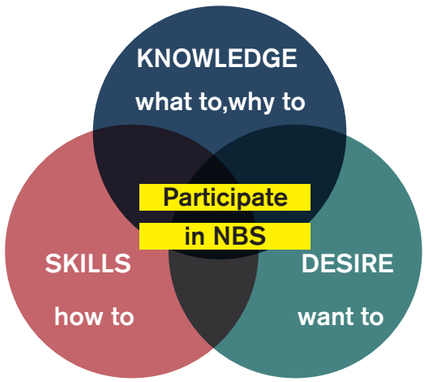
Firstly, different interests and expectations lead to conflicts in space use. External stakeholders may work in different directions (Back, 2020) For instance, environmentalists are very supportive of green infrastructure but there are others whose attitude may more conservation-led and don't want to put money into a green asset. Not to mention that other stakeholders may work against NBS like the example of car owners mentioned above. Relate to urban livability losing parking space for green space may be a threat to urban livelihood. Secondly, the conflicts out of the trade-offs of NBS are mentioned above. To balance these conflicts and facilitate participation, some researchers recommended that a combined top-down and bottom-up governance system is needed to ensure that the NBS is embracing social needs (Bush & Doyon, 2019; Raymond & al, 2017). Another idea addressed the importance of communication for connecting interests through the whole processes of implemented NBS (Nature-Based Solutions: Implications on Design, Planning, Governance and Economics, 2020).

Pic 4.1.4 Different interest may lead to different space results

Sorce: Illustrated by author,

4.2 Understanding 'participating in NBS' from a social psychological perspective

If we understand NBS as a choice, participating in NBS is a series of behaviors and actions. From a socio-psychological perspective, it is possible to better understand the conditions required behind the initiation of this set of behaviors. And an effective habit can be understood as being supported by a combination of knowledge (what to do, why to), desire (want to), and skills (how to) (Covey,2004) (Pic. 4.2.1). The absence of any link will make it impossible to carry out the behavior effectively.



Pic 4.2.1 Patterns of participating in NBS

Sorce: Illustrated by author,
Based on the internalized principles & patterns od behavior , what is a habit? Habits patterns of behavior composed of 3 overlapping components.

In the case of potential participant residents, for example, the knowledge level may be an obstacle because they do not know what NBS options are available to them and what benefits these measures will bring them. Difficulties at the desirability level can be interpreted as a situation where they are aware of the benefits of NBS, but have no desire to take action due to financial or design concerns. Technical difficulties may come from, for example, wanting to build a community garden but not knowing how to contact key stakeholders and a lack of knowledge about design and operation and garden management.

Through case studies, interviews and a literature review, we summarised the barriers to participation in NBS for each group in three areas: knowledge, skills and desise

	Awareness	Motivation	Skills
Tenent	*For tenants, they may **lack knowledge** of biodiversity; **unfamiliar** with NBS; not understand **the process of participation** and how to get involved*	*They may **lack a strong desire** to transform the environment due to **limited lease terms**; they do not understand the conditions of use of the **various NBS and the potential benefits**; they do not have the **time or conditions** to maintain the items; NBS have natural uncertainties and their growth and maintenance takes a long period, so they do not have a **clear picture of the result***	*They may lack **gardening skills**; they may face a **lack of infrastructure**, e.g. plumbing, tool shed; they may **lack support**, e.g. financially, in terms of information ; They **lack authority** to chande the environment ; They may have **different interests** for the communal land*
Landlord	*The same challenges with tenents.*	*Unlike tenants, they are not restricted by lease dates*	*Unlike tenants, they have the right to adapt the house and site*
Housing association	*The same challenges with tenents.*	*They are primarily **profit driven** and are more concerned with the potential impact and benefits of NBS and the benefits of the inputs and outputs.*	*They will be concerned about the **maintenance and operation** of the NBS at a later stage, and the **distribution of responsibilities***
Enterprises	*The same challenges with tenents.*	*Again, they are profit driven and their willingness may be influenced by the **feedback cycle of the project**, as well as the **feasibility of the business model***	*The same challenges with housing association*

Chart.3.2.2 Participatoory challenges for main stakeholders from Knowledge , Desire, and Skills

Sorce: Illustrated by author,

4.3 Stakeholder groups involved in the project

To understand how the landscape in the city relates to social groups, we also need to know who these important participant groups are.

Public authorities

They are policymakers, leading key decisions, guiding urban projects, underpinning urban infrastructure, and providing public subsidies.
In this project, e.g. municipalities, Rotterdam government, etc.

Non-government authorities

They are foundations, environmental charities, platforms, etc. They play an important role in providing financial support, communication platforms, technical and professional expertise and connect with other stakeholders for many NBS projects.

In rotterdam , e.g. Platform Binnentuien (an interactive platform for discussion, knowledge exchange and deepening for everyone involved in the collective garden) ; Rotterdam Milieucentrum Center (RMC) (A non-profit organisation focusing on nature and the environment in Rotterdam)

Primary stakeholders

These stakeholders take specific actions such as investing, providing raw materials, building operations, etc.
Examples of key stakeholders include, landowners, housing companies, suppliers, etc.

Examples

Rotterdam Germeente

Municipility

Rotterdam Milieucetrum center

Platform Binnentuin

Landowner

Housing cooperation

Investors

Landsacpe management groups

Secondary stakeholders

They are not directly involved in decision-making, but can indirectly influence it through their will or activities (Staff, 2020).

For example, the wishes of community groups, the advice of ecologists, the vision came up by designers, etc.

Dormant stakeholders

Refers to groups that are not directly relevant and are at this stage less empowered, who have little or no participation due to a lack of urgency and legitimacy to participate and are not empowered.

In the context of this project it refers to a wide range of community groups, private landowners, residents, kids, and even visitors etc., who are considered to have great potential to participate and transform the urban landscape.

Examples

Designers

local municipility

Ecologist

Academic

Community representatives

some contract owners

visitors

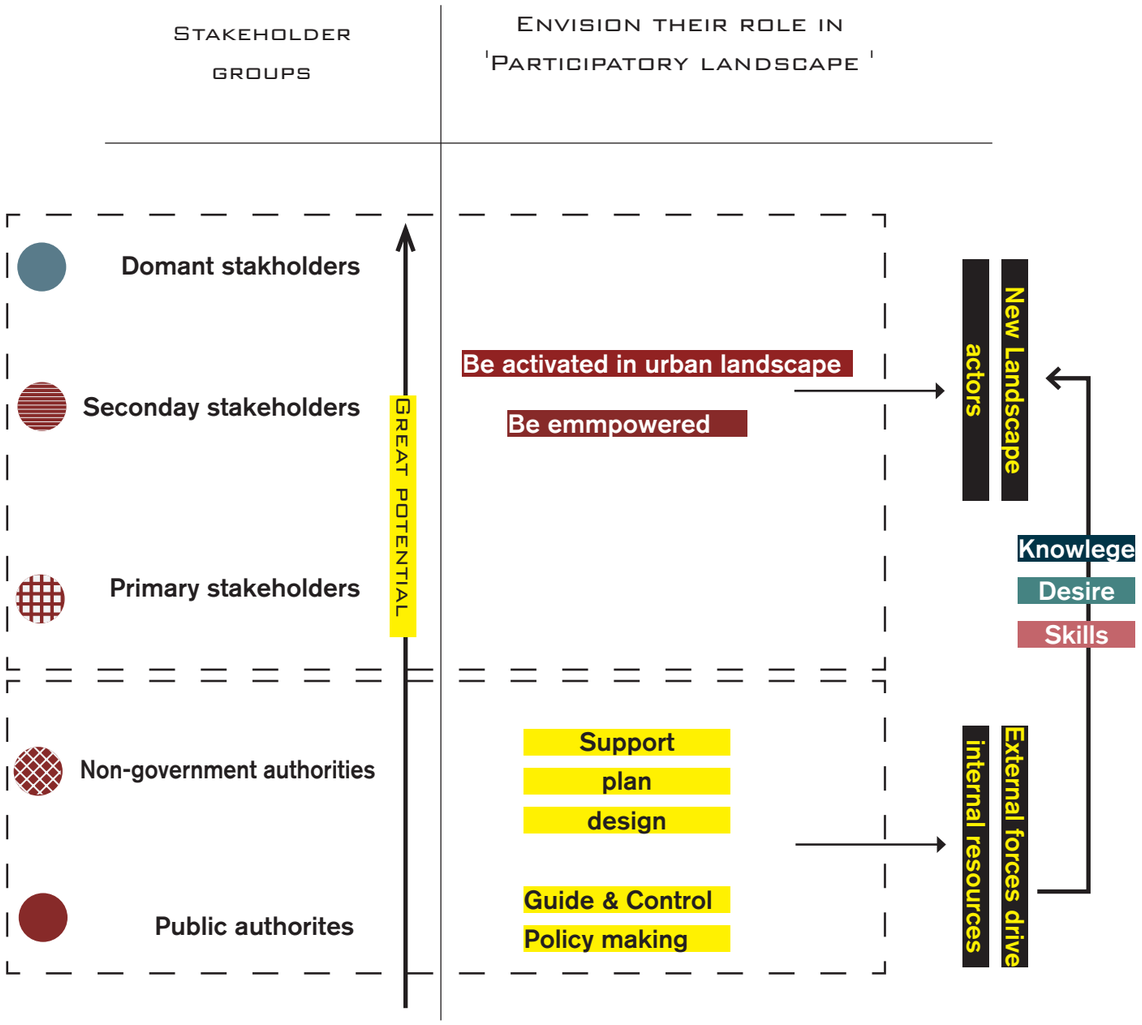
kids

4.4 Future role of stakeholders

It is necessary for the design to activate more social participation so that the internal resources of the community can be better explored, which can be understood as material giving, lending support, behavioral commitment, guidance and advice, promotion, emotional interaction, etc.

Form 4.4.1 Activate various stakeholders in the project

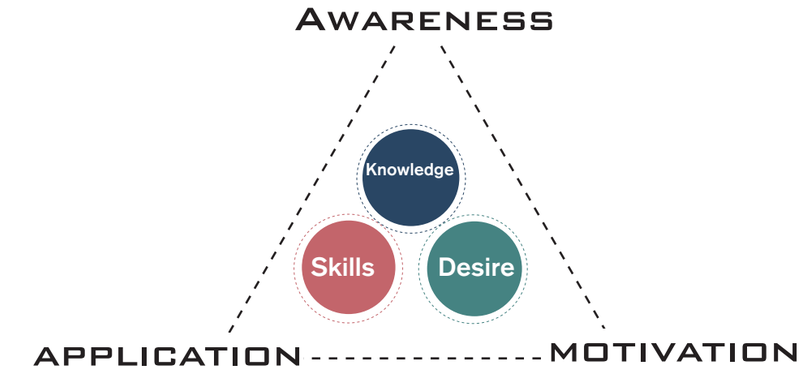
Sorce: Illustrated by author,



4.5 Conclusion of participatory gaps

To summarize the barriers to participation: at the knowledge level, it can be summarized as a lack of social awareness; at the desired level, participation needs to be given a stronger motivation; at the technical level, participation needs to be supported by space, infrastructure, policies, organizational relationships, etc. to ensure its application.

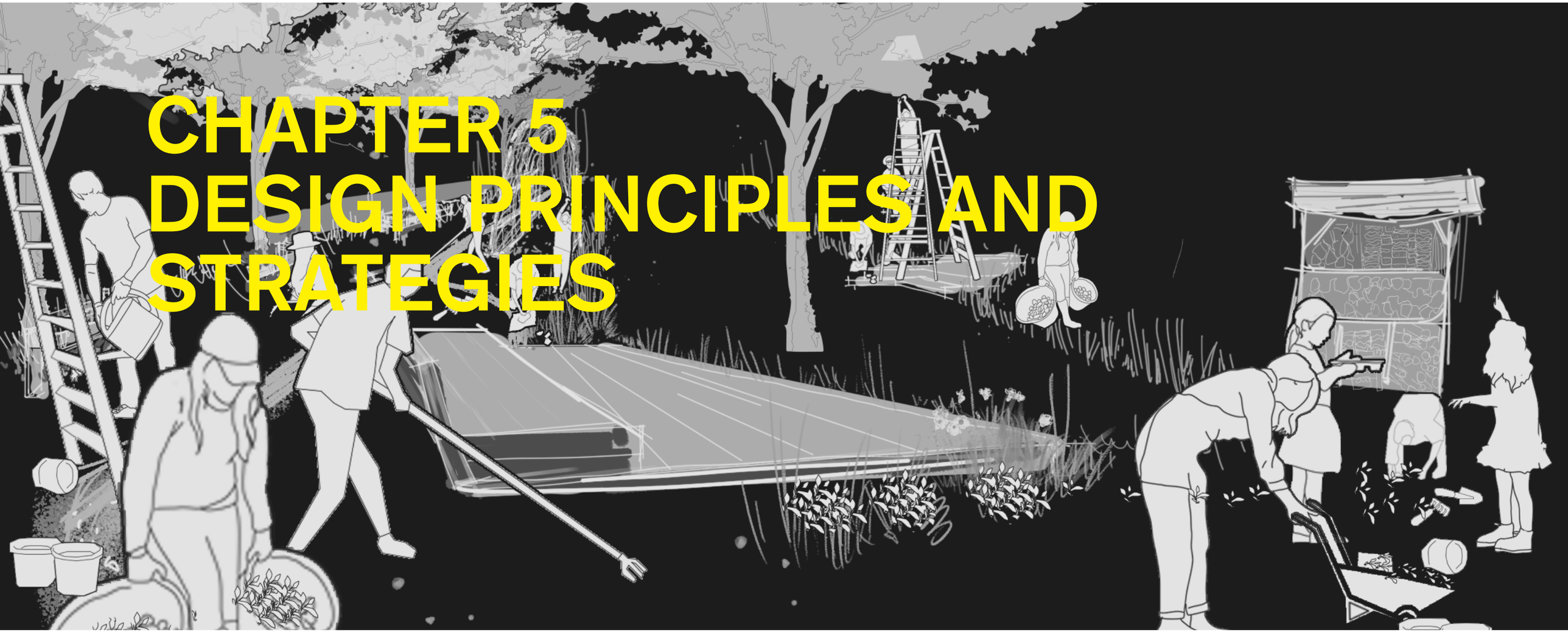
The project strategies will therefore continue to focus on how the design raises social awareness, how it enhances the motivation to participate, and how it facilitates the implementation of community projects.



Pic 4.5.1 Three aspect of focus for strategies development

Sorce: Illustrated by author,

CHAPTER 5
DESIGN PRINCIPLES AND STRATEGIES



Sub-Rq4

Sub-Rq 4: What are the planning strategies that respond to participation gaps?

In order to generate a spatial strategy in response to the main obstacles to participation (section 4.5), the project should first be based on certain principles. Within the framework of principles, strategies can be seen as schemes that can be continuously evolved.

- 5.1 Design principles

- 5.2 Design strategies

  - 5.2.1 Transformative placemaking to enhance social awareness
  - 5.2.2 Stimulate motivation by policymaking, improving landscape infrastructure, and diversifying interventions.
  - 5.2.3 Empower the community to facilitate the application of green initiatives

- 5.3 Conclusion

5.1 Design principles

The project set these spatial principles to respond to the barriers to participation analyzed in sections 4.1 and section 4.2 .

Pic.5.1.1 Planning principle for participatory landscape

Sorce: Illustrated by author,

AWARENESS

Incresae social awareness of nature-based solutions and biodiversity benefit.

SOCIAL AWAREANESS

1 Keep people informed

We want the community to work together to transform the urban landscape, so we need to effectively communicate the intention of the decision makers or designers and inform the community of the transformation they are undergoing, raising their awareness and concern for the urban environment.

2 Interactivity

Sustainable transformation requires a market, practical, and policy response. In this context, experimental intervention sites give NBS with stakeholders to design, test and learn from technological innovations, and likewise increase the likelihood of potential participants, engaging in experimentation and learning.

An important factor in motivating participatory behavior to occur is how to link people's various activities to NBS and make NBS a motivating factor in achieving the city's agenda goals.'

MOTIVATON

MOTIVATION

1 Diversity

The diversity of NBS programs can meet the needs of a wider group of people, and the transformation of different needs into motivations attracts more participants.

2 Phase corcern

Time is an important factor in social perception change and sustainability (ingredient, 2019), so phased input and flexible planning is an important issue. Planning and design processes also share a similar temporal perspective with NBS. This is due to planning processes are "the guidance of future actions" (Eraydin, 2013) and during which attempts to combine concerns on multiple temporal scales, ranging the short, medium, and long-term (Bush & Doyon, 2019).

3 Incentivity

The strategy considers how to make the use of NBS worthwhile and receive the benefits it brings, such as financial subsidies, increased property values, and reduced domestic electricity use.

4 Flexibility

Refers to flexibility in design and operation. Encourage tenants to participate for short periods of time, or encourage restrictions on the development of sites that are temporary and natural, so as to ensure that they do not conflict with future urban development plans.

How to narrow the knowledge gap and increase public acceptance of NBS and attention to urban natural biodiversity is the focus of this perspective, and can therefore the theme can be summarized as 'social awareness'

APPLICATION

SOCIAL AWARENESS

1 Sustainability

The sustainability of participation is reflected in the fact that it can be operated in the long term and can be adapted to future social development and community diversity.

2 Process

It refers to the openness and fairness of the participation process. This contributes to social equity as well as the development of public trust.

3 Monitoring

It refers to how to ensure the long-term sustainable operation of NBS projects and to avoid possible risks.

5.2 Design strategies

The planning and design strategies will be based on these principles and evolve from the case studies. They can be applied to a broader range of urban cases.

How spatial strategies contribute to knowledge sharing and social awareness?

Pic 5.2.1 Break down the strategy from three main questions

Sorce: Illustrated by author,

Track 1

How spatial strategies contribute to knowledge sharing and social awareness?

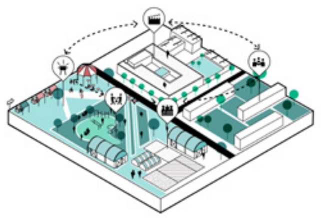
1 5.2.1 Transformative placemaking to enhance social awareness (TPM)

Transformative placemaking refers to the creation of an iconic space or landscape, that reasserts the meaning of place and the identity of social space. This space helps draw attention to nearby activities and contributes to the penetration of decisions. It reinforces visibility for communities interested in implementing transformation.

Pic 5.2.1.1 Spatial design strategies for transformative place-making

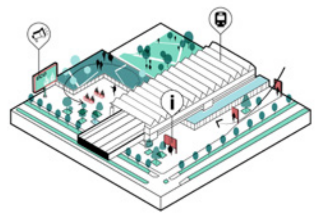
Sorce: Illustrated by author,

TPM 01 Multi-functional space



Develop participatory activities in conjunction with existing community service venues and incorporate the needs of community residents

TPM 02 Transform iconic space

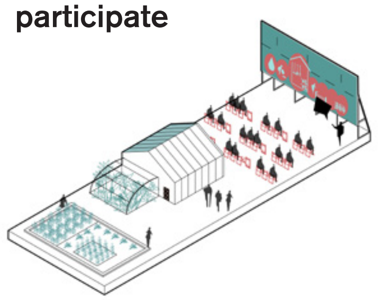


These spaces allow researchers and stakeholders to communicate their messages more effectively, and their accessibility has the potential to influence more domant stakeholders

TPM 03 Develop Green initiatives pilots with urban development projects

Urban transformation could use external investment to integrate ecological concepts and to create iconic places. Such projects can often be very efficient and bring about a change of place very quickly

TPM 04 Provide a place where you can learn, share and participate



Allow stakeholders or potential stakeholders to learn, design, test and experience ecological measures

Explore strategies from case studies

The design strategy for Pic3.4.1 is summarised in the case studies and the two cases and the impact of their application are described in detail below.

Sorce: Pic from RUDGR,COM

The BlueCity Lab (BCL) is a living laboratory in Rotterdam that aims to be a platform for the circular economy. The project has become an experiment and demonstration project for a successful business business model by creating and working together in a space, hosting participatory events and conferences, providing lectures, experimental spaces etc.

In addition to this, placemaking includes a variety of place-related functions such as bars, restaurants, leisure, catering, offices, food production, conferences, and living. The income generated by renting out the space continues to be invested in more commercial possibilities.

Sorce: Pic by Christele Harrouk

The project adopts a nature-based design strategy with the aim of enhancing social connectivity and local renewable energy to transform the site into an 'eco-community'. In this community, densification is the source of funding for urban regeneration, with several urban parks, offices, schools, restaurants, urban farms and design-related incubators forming a diverse and vibrant ecological community.

Track 2

How design inspires motivation to engage with NBS and the urban landscape ?

2 5.2.2 Stimulate motivation by policymaking,improving landscape infrastructure, and diversifying interventions (M)

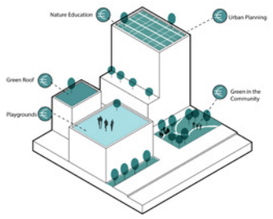
If the act of participating in NBS is linked to the contribution to its society and environment and to people's daily lives, so that it is no longer just an option for environmental protection, but a link to social, recreational, or even productive and working life, participation becomes a more motivated choice.

Pic 5.2.2.2 Motivating participation from a policy , infrasturture system and design perspective

Sorce: Illustrated by author,

M 01

Green Subsidy



Public policy could develop different strategies for providing green subsidies to reduce the input threshold for participants. Or set limits on the percentage of green space in new buildings, (e.g. private developers or construction companies need to ensure sufficient hungry green space in the development process).

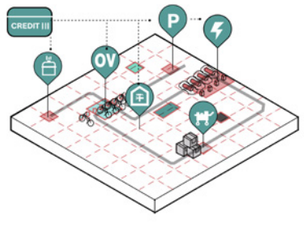
M 02

Semi- finished design

Providing a semi-finished space, participants are encouraged to include elements such as skits, signs and props, as well as planting and harvesting.

M 03

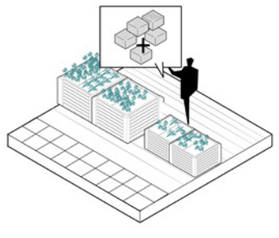
Credit & infrastructure system



The credit system refers to the credit that residents can live through their efforts in their neighbourhoods, credit that can also be linked to various city facilities such as sports, leisure, transport and maintenance projects. to achieve feedback on the improvement of quality of life from participatory activities.

M 04

Flexible design elements



The use of flexible landscape elements provides a sufficiently flexible site for the participants. This ensures that the design can flexibly change with demand and will also reduce the initial investment and barriers.

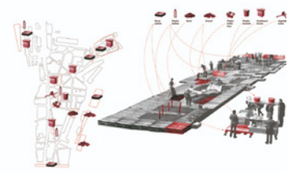
Explore strategies from case studies

M 01

The participation of Rotterdam's residents is essential, as around 60% of the city is on private land (Subsidieregeling Klimaatadaptatie 2021!, 2021), and the climate adaptation subsidy scheme aims to encourage Rotterdam residents and Rotterdam companies, associations and foundations to make their terrain more resilient to climate change and to prepare for extreme weather.

source: Pic from *Subsidieregeling Klimaatadaptatie 2021!, 2021*

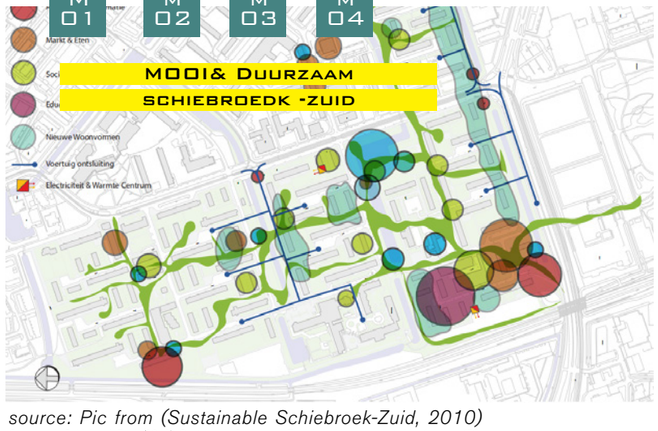
M 02 M 03



Eco box is a series of self-managed projects. The design creates a series of footpaths and small gardens by arranging a system of recycled transport pallets in a grid format. Local community members create and tend flowers and edible plants to assemble a diverse landscape. They can also gradually expand and upgrade their gardens.

source:Pic from Carrot City - Ecobox, 2001

M 01 M 02 M 03 M 04



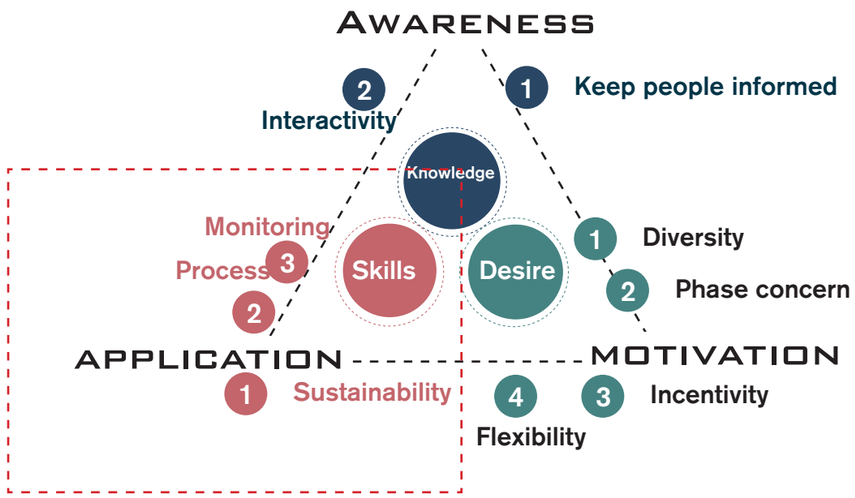
The chiebroek-zuid plan is a sustainable transformation and development programme designed by EXCEPT. The aim is to transform the community into a selff sufiecient resilient and sustainable area. The plan combines the benefits of urban agriculture, social projects, sustainable landscapes and business support. everyone can participate in the community projects and the projects propose a credit system where participation is rewarded, thus not only encouraging participation but also sustaining the community.

source: Pic from (Sustainable Schiebroek-Zuid, 2010)

Sustainable Schiebroek-Zuid. (2010). Sustainable Schiebroek-Zuid. http://www.except.nl/en/projects/56-sustainable-schiebroek-zuid

Track 3

How to ensure the long-term operation and application of the project ?



Pic 3.3.1 Planning principle for participatory landscape

Sorce: Illustrated by author,

3

5.2.3 Empower the community to facilitate the application of green initiatives (EC)

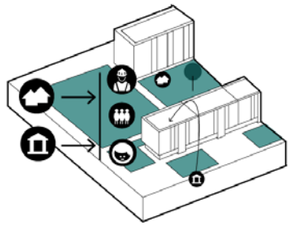
The corresponding strategy explores how to ensure the effective implementation and longevity of the strategy in terms of increasing the usefulness of the space for multiple functions, subdivision of responsibility blocks, transfer of authority and responsibility, the establishment of garden groups, and phased development.

Pic 5.2.3.1 Motivating participation from a policy , infrasturture system and design perspective

Sorce: Illustrated by author,

EC 01

Transfer of authority and responsibility to community



Municipal land, land for defence companies, etc. can be directed to ecologically transformed sites by conferring development rights on residents.

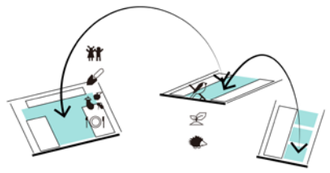
EC 02

Strengthening and building capacity of residents to self-organize

The community can work together to maintain and operate the collective yard.An example is the establishment of a garden group, where members can join and leave voluntarily. They form effective teams for event operation, information gathering, maintenance, management of funds and materials, etc.

EC 03

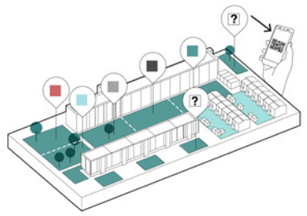
Phase concern



Whether it is sustainability or transformation, time is the main factor. Considering that not all interventions can be carried out simultaneously, in order to make the plan work financially and to maintain a stable social fabric, it is recommended that the start-up phase be combined with the projects to be developed in the community, in order to provide confidence for future planning and investment

EC 04

Segmentation of responsibility



The subdivision of the space to facilitate the division of the participants into responsibility blocks during the operational phase of the city, the connection of the participants to the fixed plots through a sense of belonging and responsibility, and the combination with the corresponding incentive mechanisms contribute to the sustainability of public participation.

Explore strategies from case studies

EC 01 EC 02

By reducing the paving, the ZoHo area has replaced a large area of pavement and two parking spaces on the original municipal site with a small garden and has put the management of the garden into the hands of the community.

source: Pic from ZOHO Climate Proof District (2014)

EC 01 EC 02 EC 03 EC 04

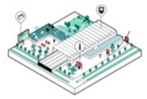
The Tuin de bajonet was once an anonymous stone square, it is now a sustainable agricultural inner-city community garden that offers many interactive features for community residents and visitors.
Maintenance and management is the responsibility of the established Garden Club, and the garden is divided into many sections, with members or volunteers taking responsibility for maintenance and managemen.

source: Pic by Tuin de Bajonet

5.3 Conclusion : Three tracks to ecncourage social participation

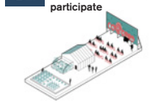
TPM 01 Multi-functional space

TPM 02 Transform iconic space



TPM 03 Develop Green initiatives pilots with urban development projects

TPM 04 Provide a place where you can learn, share and participate



1 Transformative placemaking to enhance social awareness

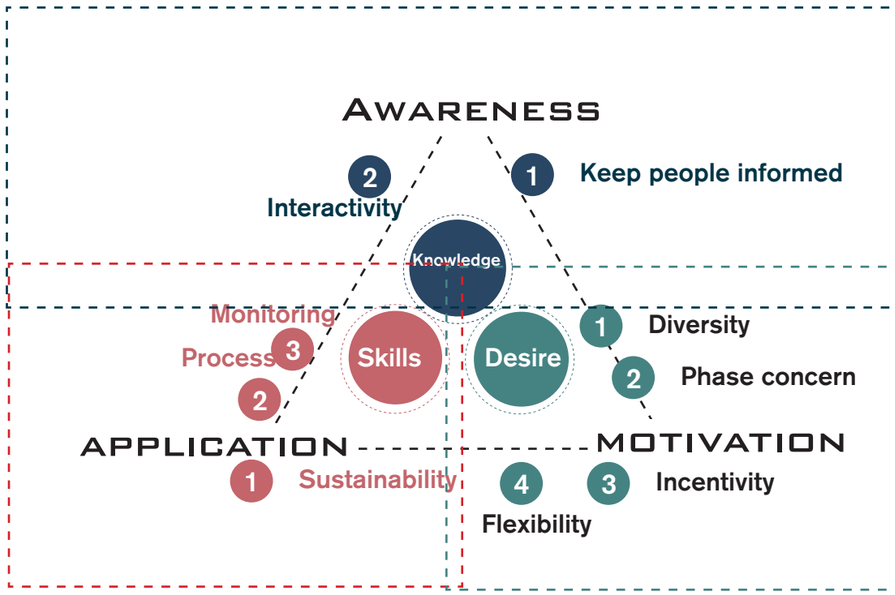
3 Empower the community to facilitate the application of green initiatives

EC 01 Transfer of authority and responsibility to community

EC 02 Strengthening and building capacity of residents to self-organise

EC 03 Phase concern

EC 04 Segmentation of responsibility



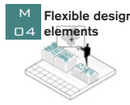
2 Stimulate motivation by policymaking, improving landscape infrastructure and diversifying interventions

M 01 Green Subsidy

M 02 Semi- finished design

M 03 Credit & infrastructure system

M 04 Flexible design elements



CHAPTER 6
DESIGN PROPOSAL

Sub-Rq5

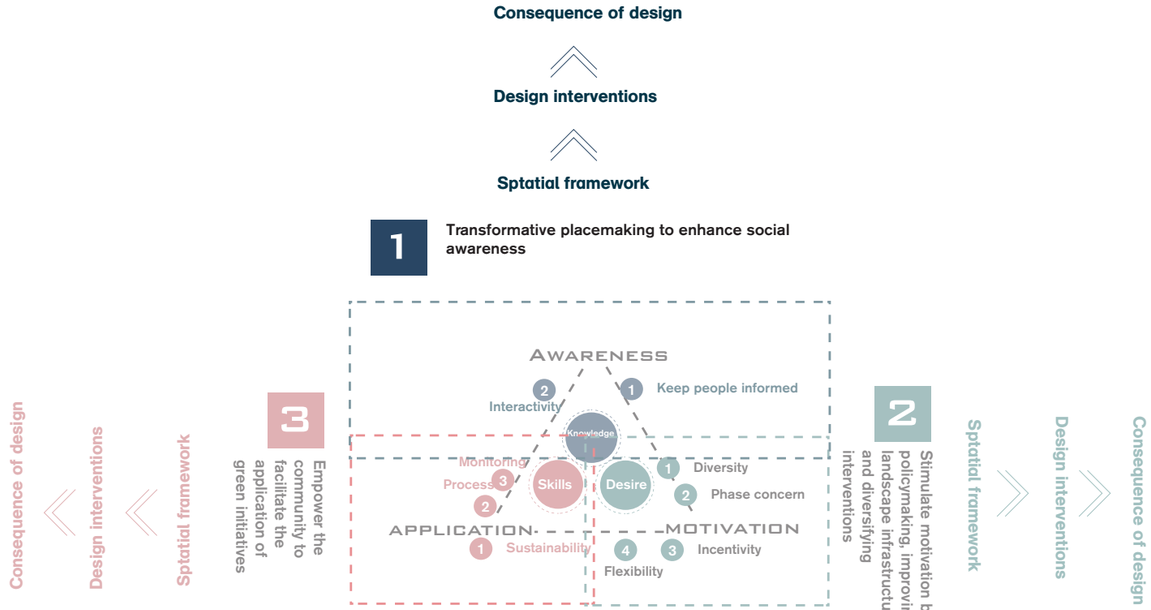
Sub-Rq 5:How the strategies are reflected in the planning and design process?

The interpretation of the strategy in the site will be based on the three tracks summarised in section 5.3, each of which will range from spatial framework to design interventions.

- 6.1 Track 1
  spatial framework -> design interventions -> consequence of design
- 6.2 Track 2
  spatial framework -> design interventions -> consequence of design
- 6.3 Track 3
  spatial framework -> design interventions -> consequence of design

- 6.4 Conclusion
- 6.5 Consequence of design

6.1 Track 1: Transformative place-making



6.1.1 Spatial framework

In track 1, the main aim is to create iconic green space environments, to recreate the atmosphere of the place, and to be able to influence the ecological awareness of the community as widely as possible.

Therefore, according to section 5.2.1 on transformative placemaking schemes, and based on the analysis of the sites in chapter 3, the project can generate a potential map of the corresponding schemes (Pic.6.1.1).

Pic 6.1.1 Potential map for transformative place-making

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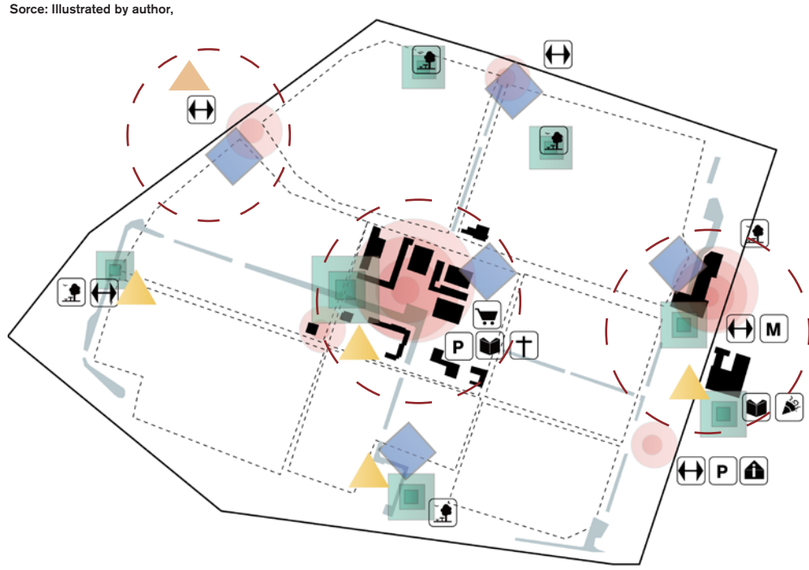
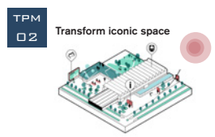
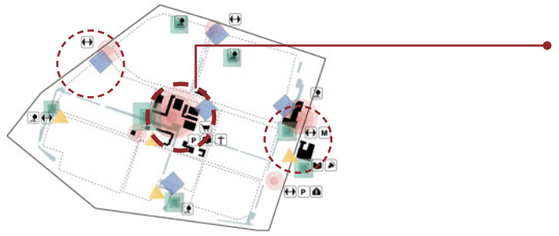




6.1.2 Design intervention

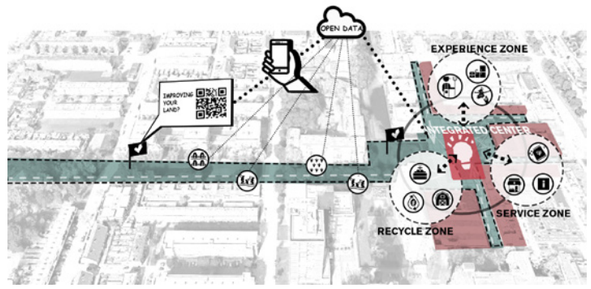


Plein 1953 :This site has a high potential for conversion and has been chosen as the site for track1 design interventions.

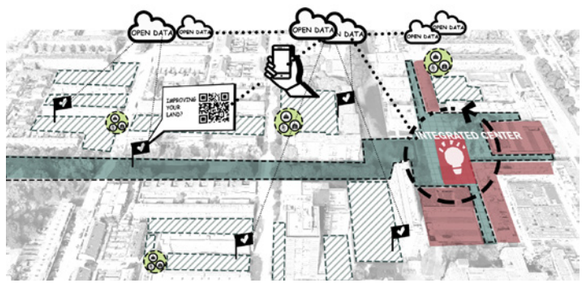
6.1.2.1Design concept for plein 1953

Sorce: Illustrated by author,

1. Plein 1953 is now a stone square that brings together a number of social service functions.



2. The square and its surrounding built environment have the potential to be transformed into a combination of eco-experience, eco-product services, and community eco-information center. Residents can easily participate in the experience, access relevant knowledge and services, exchange experiences, etc.



3. The transformation of the surroundings of the site helps to increase the ecological awareness of the neighbourhood and serves as a guide as well as an ecological education.

6.1.2.1.2 Design process

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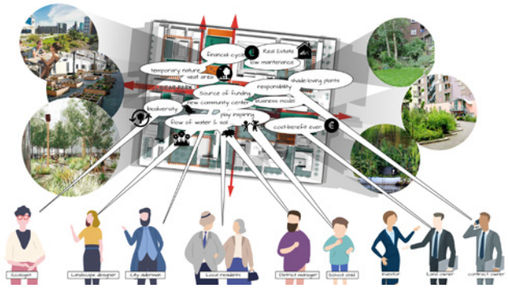
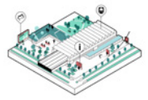


1. Contacting stakeholders and gathering their needs and ideas

2. Integrate design schemes of TPM ,and develop the green system

TPM 01 Multi-functional space

TPM 02 Transform iconic space



TPM 03 Develop Green initiatives pilots with urban development projects

TPM 04 Provide a place where you can learn, share and participate

Public Ecological service system

Semi- Public Ecological service system

Activated roof garden

TPM 01 TPM 02 TPM 04

A.Scenario 1

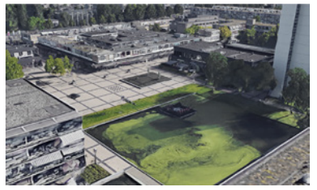
Placemaking led by the public sector

TPM 01 TPM 02 TPM 03 TPM 04

B.Scenario 2

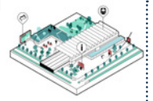
Placemaking is led by private landholders and defence companies

Scenario 1 : Biodiversity square (Public-sector led)



In this scheme, the renewal of premises is mainly led by public sector funding. In the process, stakeholders from various sectors are encouraged to participate in the renovation of the premises and will be rewarded with appropriate financial subsidies.

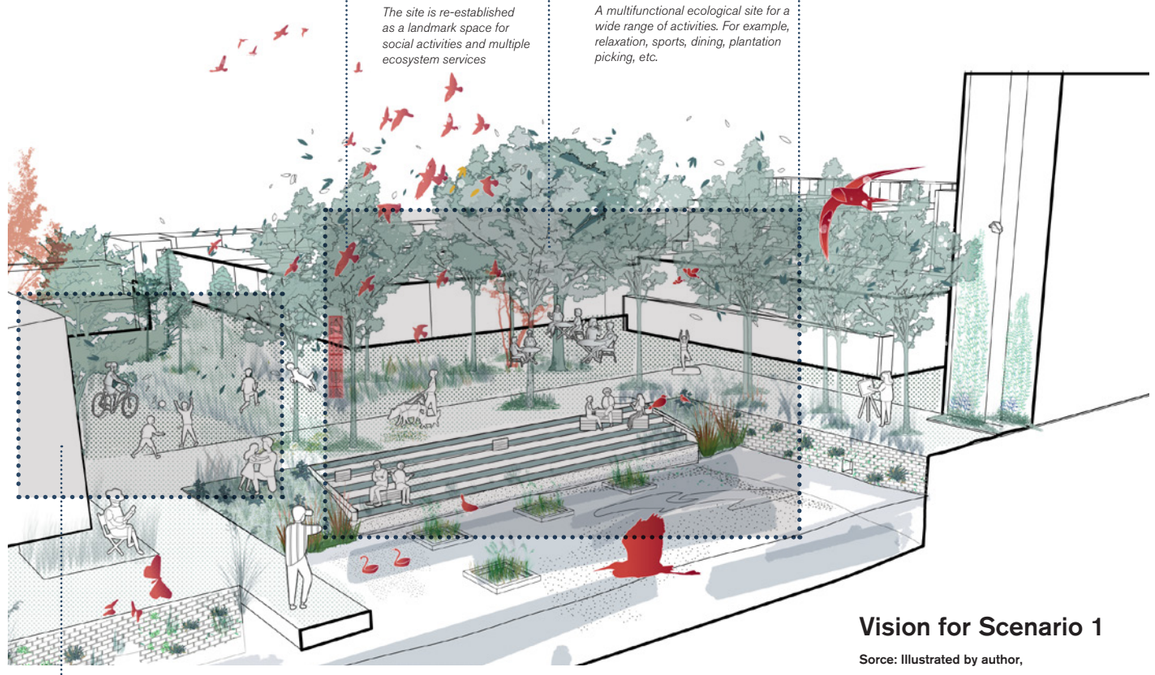
TPM 02 Transform iconic space



The site is re-established as a landmark space for social activities and multiple ecosystem services

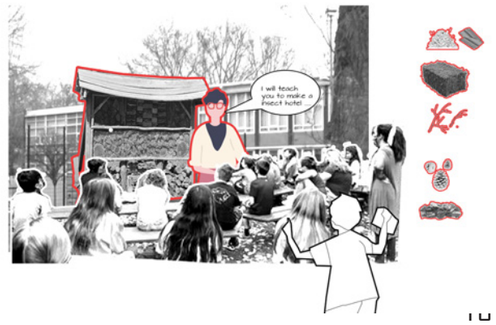
TPM 01 Multi-functional space

A multifunctional ecological site for a wide range of activities. For example, relaxation, sports, dining, plantation picking, etc.



Vision for Scenario 1

Sorce: Illustrated by author,



TPM 04 Provide a place where you can learn, share and participate

The square regularly organises eco-educational activities, not only to teach people about gardening, but also to organise the transformation of living materials into insect houses, bird hotels, floating structures and so on, to mobilise people to improve the environment with their own hands.

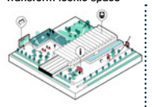
Scenario 2 : Eco-Expirement unit (Private-sector led)

In this scenario, urban regeneration and urban development projects become the main source of funding, and under the concept of design with nature, the site is transformed into an ecologically sustainable experimental unit. The outdoor space has been transformed into an ecological space where people work, relax, meet, exercise and play.

TPM 03 **Develop Green initiatives pilots with urban development projects**

Combining densification to reshape place vitalityIn conjunction with densification and the reshaping of place dynamics, the new housing needs to provide a certain percentage of green space.

TPM 02 **Transform iconic space**



In combination with the eco-buildings and eco-plaza, this is a new community centre that will attract more new residents

TPM 01 **Multi-functional space**

A multifunctional ecological site for a wide range of activities. For example, relaxation, sports, dining, plantation picking, etc.

TPM 04 **Provide a place where you can learn, share and participate**

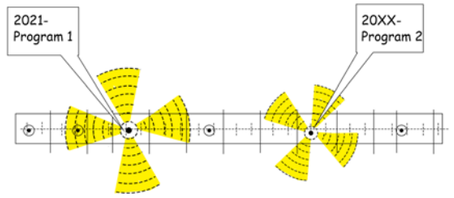
With the new project in place, investment can be attracted to create a profitable eco-centre, offering appropriate education, services and products.

Vision for Scenario 2

Sorce: Illustrated by author,

6.1.3 Design consequences

A. The creation of these iconic sites has helped the community to effectively understand the potential benefits of NBS and the social awareness of NBS has increased

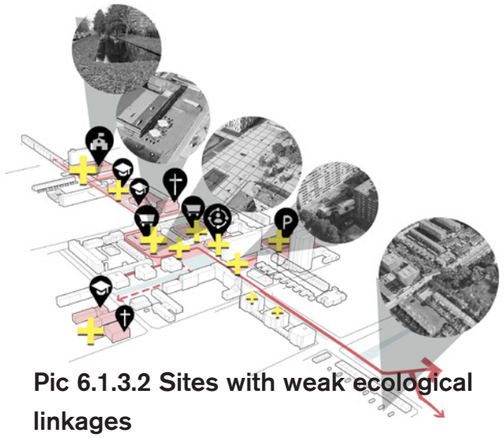


The transformation process of the project landscape starts with the connection and activation of program nodes. This contributes to the rational use of limited financial resources and the sustainable transformation of the city.

These project pilot units, with complementary urban functions and vertical extensions into green corridors, bring together emerging civic projects. And they are gradually connected to other urban facilities, gradually increasing the city's ability to regenerate itself.

B. Transformative places form complementary ecological functions that together support participatory urban landscapes

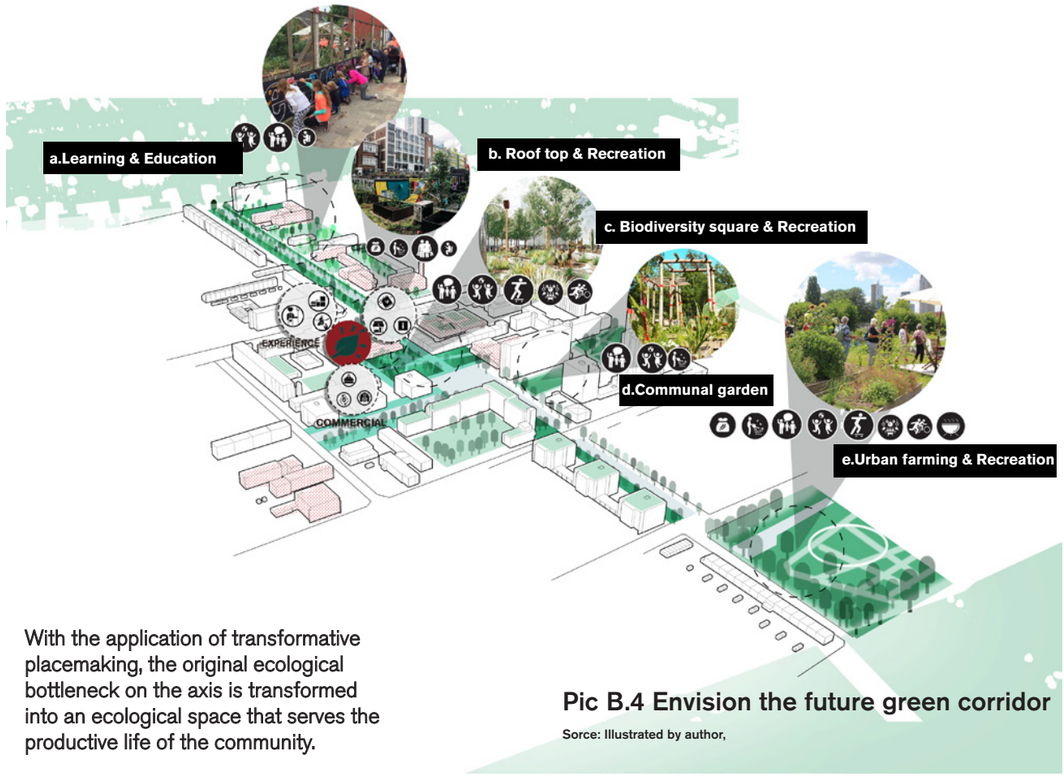
C. The neighbourhood's original green axis has been strenghthened



For example, the city's social services axis in the city centre (more detail see section 3.1.4). This axis of the city centre lacks effective ecological connectivity at this stage (Pic 6.1.3.2).

Pic 6.1.3.2 Sites with weak ecological linkages

Sorce: Illustrated by author,

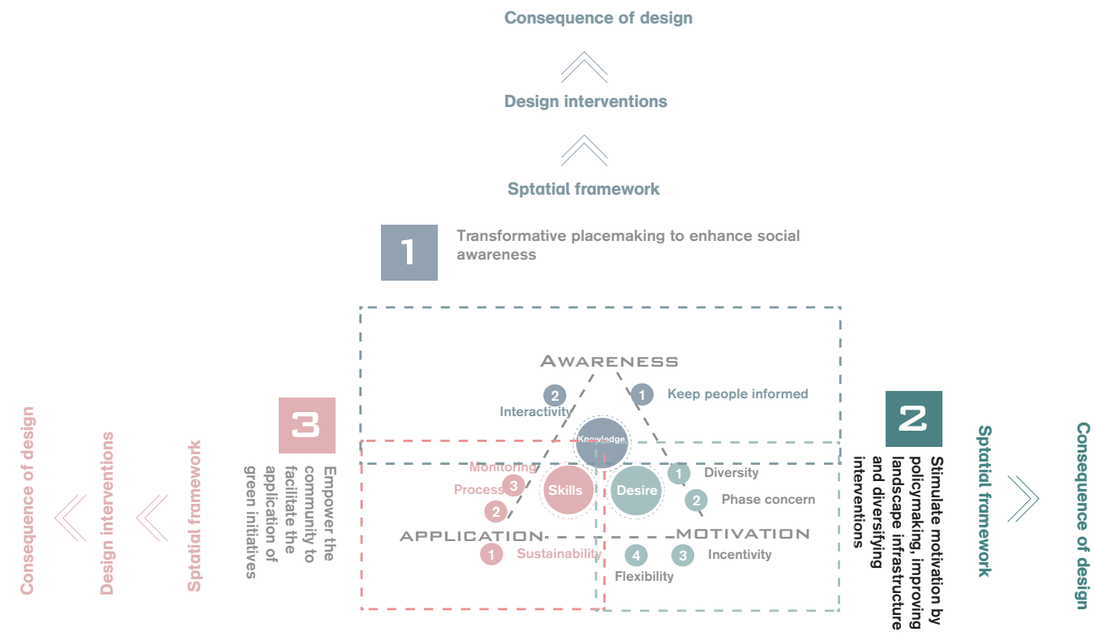


With the application of transformative placemaking, the original ecological bottleneck on the axis is transformed into an ecological space that serves the productive life of the community.

Pic B.4 Envision the future green corridor

Sorce: Illustrated by author,

2 6.2 Track 2: Motivate participation

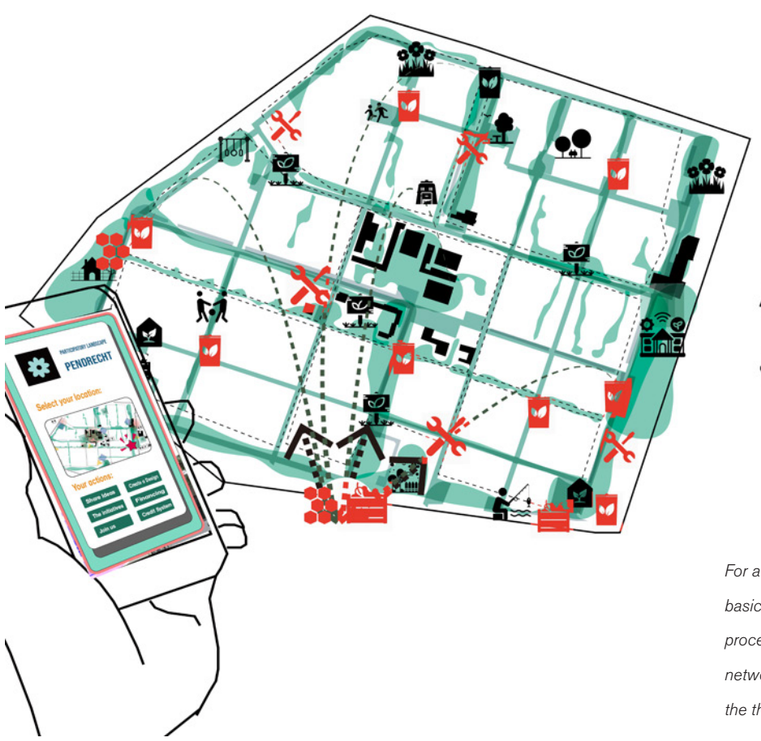


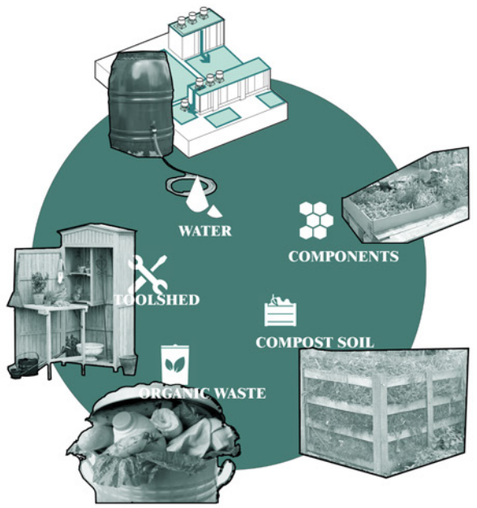
6.2.1 Spatial framework

In the second track, the main task is how to stimulate the arising of motivation for participation. For example, with the introduction of incentive mechanisms and the connection of credits to the infrastructure of the physical space of the city, social participation is thus transformed into social productivity, on the basis of which the infrastructure needed for participatory landscapes is improved to complement the motivation for participation. Not only that design from a diverse perspective can meet the needs of a wider group of people and therefore come to achieve the participation of a wider range of people.

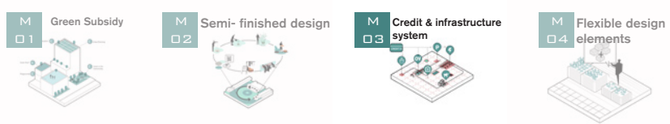
Pic 5.1.2.1 Participatory Landscape Infrastructure Network

Sorce: Illustrated by author,





For a properly functioning garden, community residents need some basic ingredients. Space for these can be set aside in the design process and gradually connect them to the urban infrastructure network, which not only saves a lot of time and money, but also lowers the threshold for resident participation.



6.2.2 Design intervention & Design consequences

A.Social participation is given a strong motivation

Vision for track 2

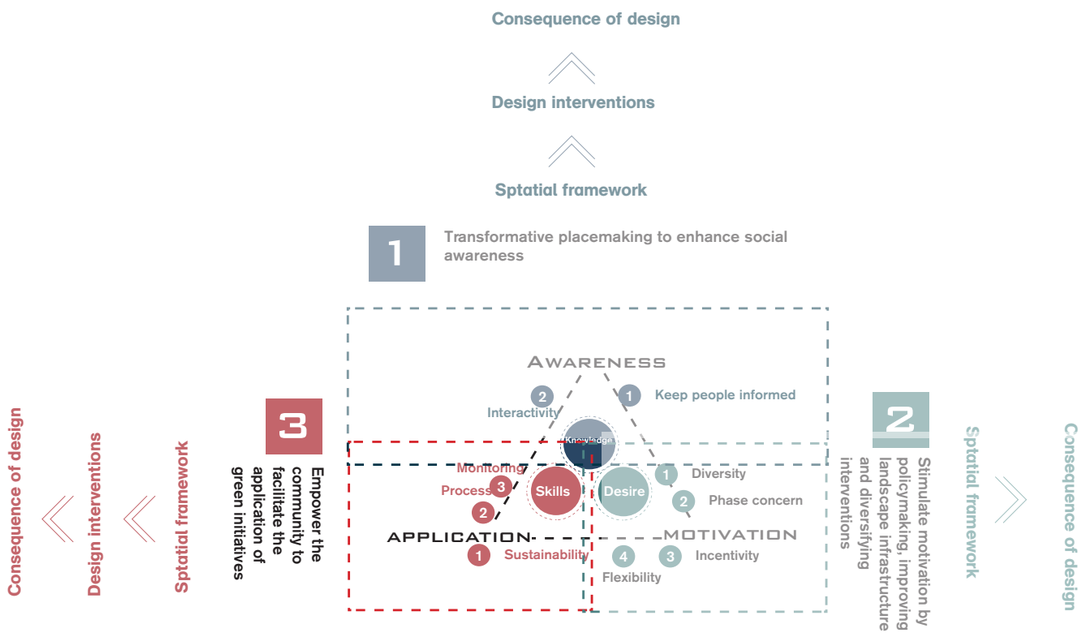
Sorce: Illustrated by author,

Green initiatives for street-side tool room assisted residents

Bringing residents and volunteers together for placemaking

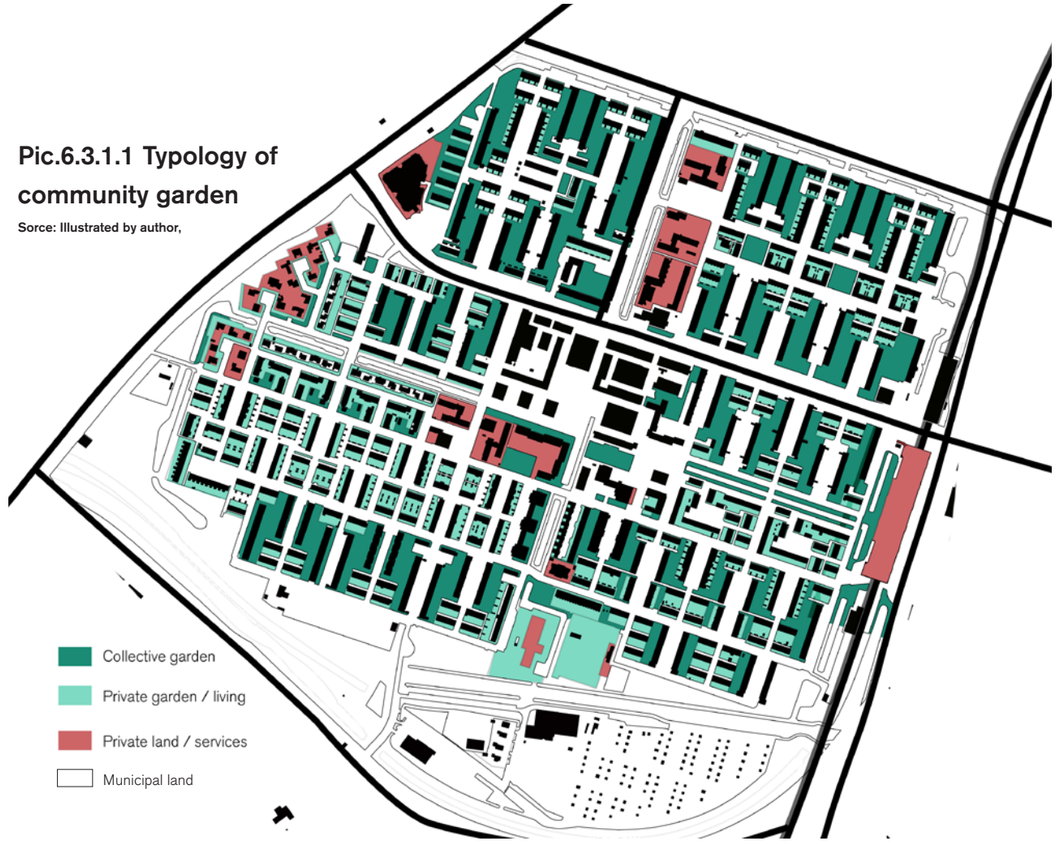
Flexible ecological elements that can adapt to changes in the function of the site and grow or move over time as required

3 6.3 Track 3: Empower the community



6.3.1 Spatial framework

For these gardens it is necessary to reposition their qualities in order to activate the potential of the public space. The key to transforming these gardens is how to simultaneously preserve their open character to the public (with the exception of private gardens) and at the same time have the quality and individuality of private gardens.



Pic.6.3.1.1 Typology of community garden

Sorce: Illustrated by author,

collective garden

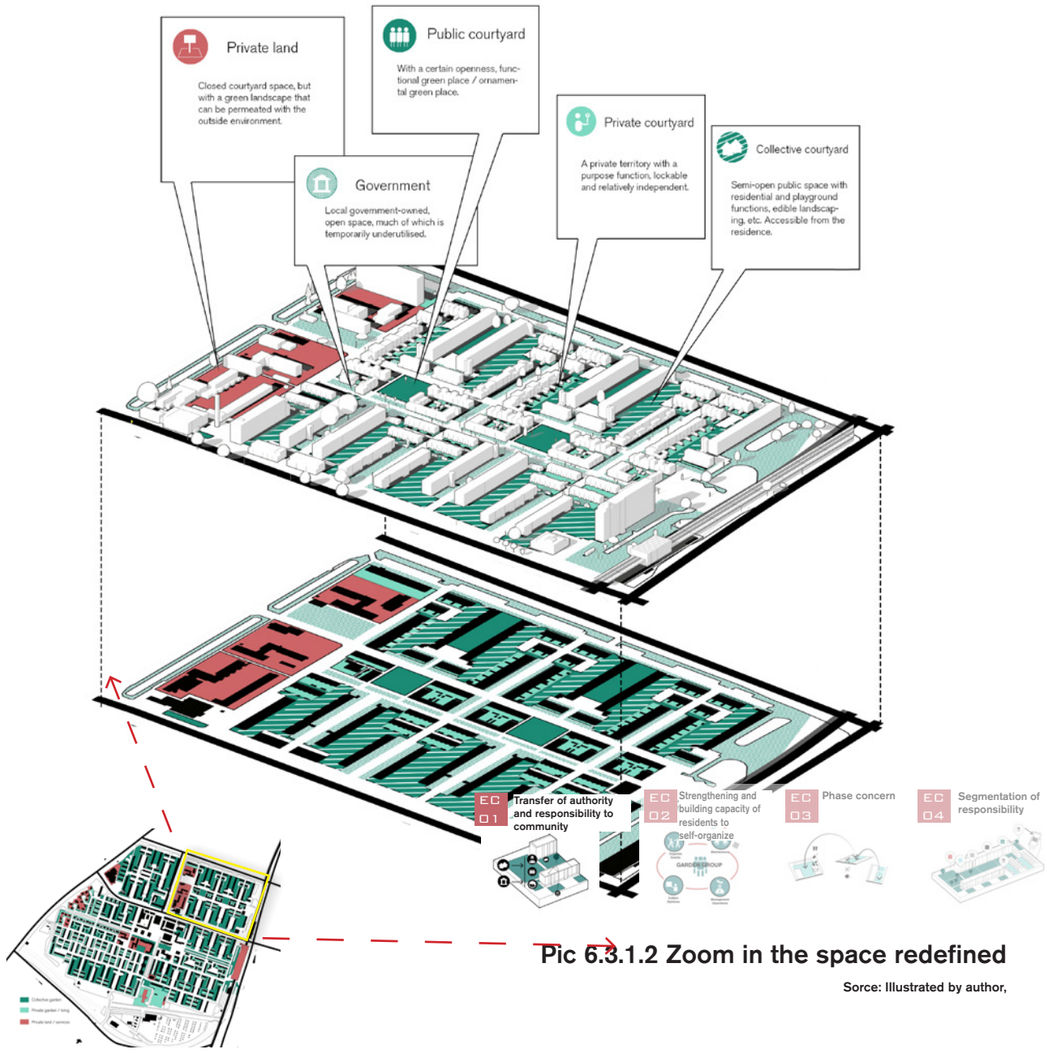
Private garden

Services garden

Municipal land

Redefine the publice space

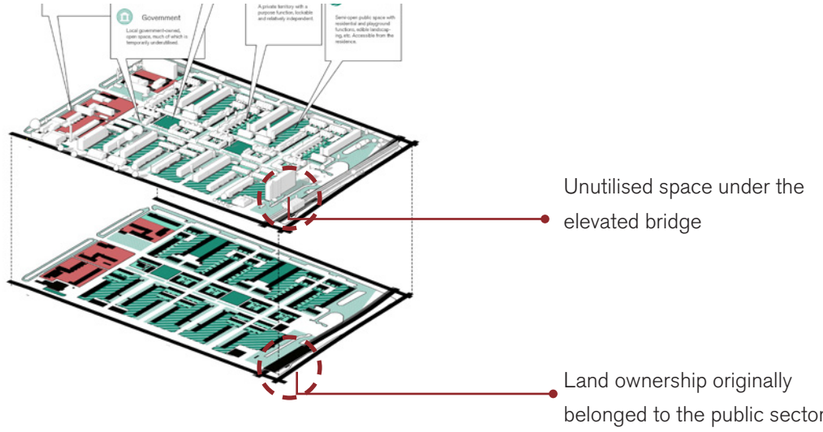
The project has classified and repositioned potential public spaces in the city as follows
Public courtyards: *public spaces that are generally kept open and have an access function and are suitable for ornamental greenery.*
Collective courtyards: *semi-private spaces, accessible from the entrance to the home, with an ornamental green/ residential function, where edible landscaping/recreational green space can be developed, etc.*
Municipal land: *Existing street spaces and green spaces, open to the public, their quality can also be enhanced through social participation. Existing green spaces can be enriched by depave existing streets, multi-layered greenery, development of edible landscapes, etc.*
Private land: *These are usually more private, with limited openness, but occupy larger spaces.*
Private courtyards: *these are often private gardens with a high degree of privacy and good spatial quality, and their ecological potential can be extended to the adaptation of built-up spaces, such as green roofs.*



Pic 6.3.1.2 Zoom in the space redefined

Sorce: Illustrated by author,

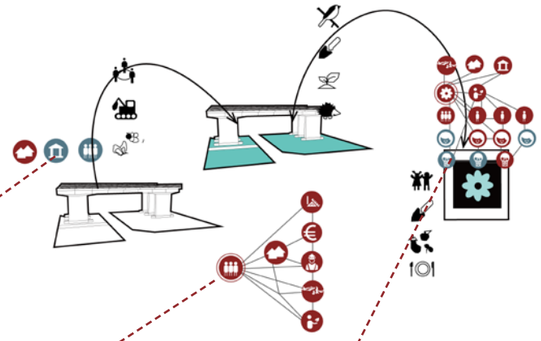
6.3.2 Design intervention



The zuiderparkweg is situated in an extensive area between the pendrecht and the Zuidwijk (see figure A.2). Next to the road in this area, there is a high-school underground track, an underground station, a car park, and a green canal system in a park-like setting. The green area was once intended as a separating element between the two functionally and spatially (in terms of the neighborhood). But we can also see this separating element as a central element of connection in terms of social activities and ecology.

Pic 6.3.1.3 Current condition of design interventio area

Sorce: Illustrated by author,



The initiator of a green project can access the tenure and repositioning of the site through public information.

Development rights are transferred from the public sector to the community

EC 01 Transfer of authority and responsibility to community

Through the community garden organisation, residents are easily connected to the various stakeholders of the project

EC 02 Strengthening and building capacity of residents to self-organize

The subsequent maintenance and operation of the nursing home is broken down for interested participants

EC 04 Segmentation of responsibility

The project attracted more potential participants and applied the successful experience model to similar sites

EC 03 Phase concern

Pic 6.3.1.4 The transformation process integrated with track2 schemes

Sorce: Illustrated by author,

Scenario : Edible garden

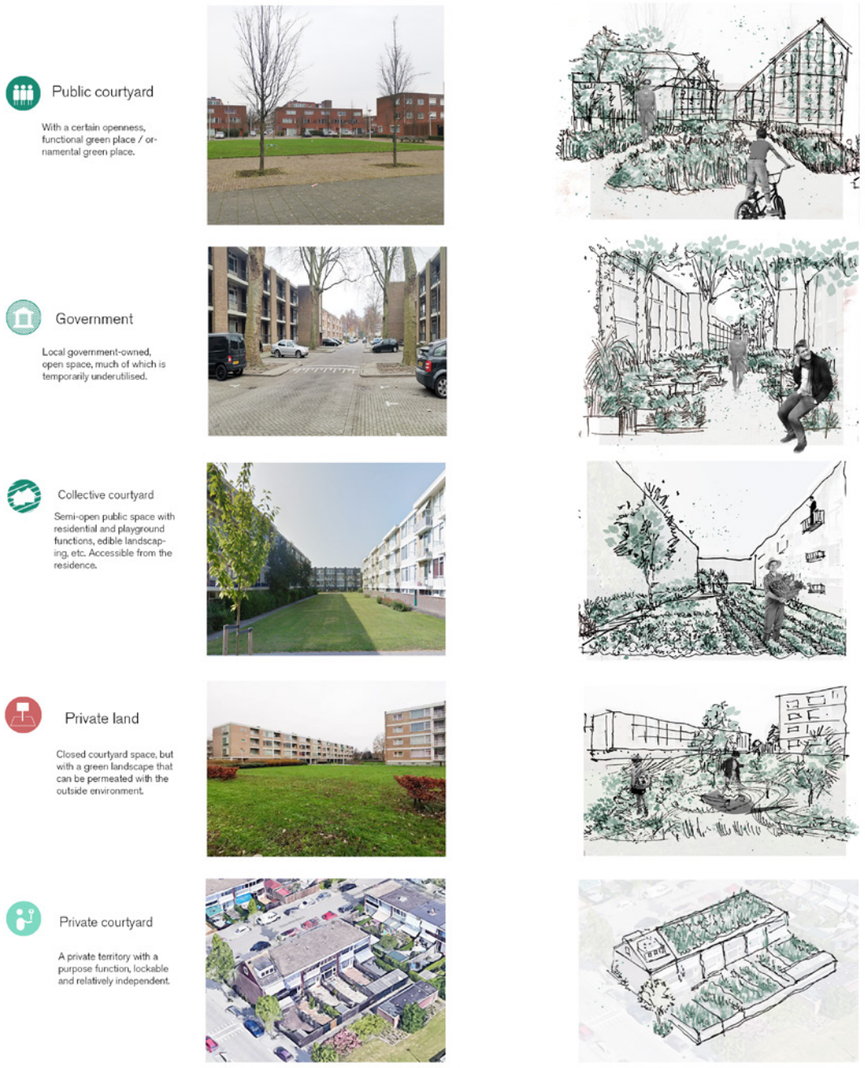
Indoor space offering gardening tools, catering, workshops and more

Space for relaxation and recreation

Regularly open for community planting and picking

6.3.3 Design consequence

A.Community residents are empowered to renew their own public spaces



Pic 6.3.3.1 Envison the future public space

Sorce: Illustrated by author,

B. Once-empty meadow that has regained its social, ecological, productive, educational and other

After

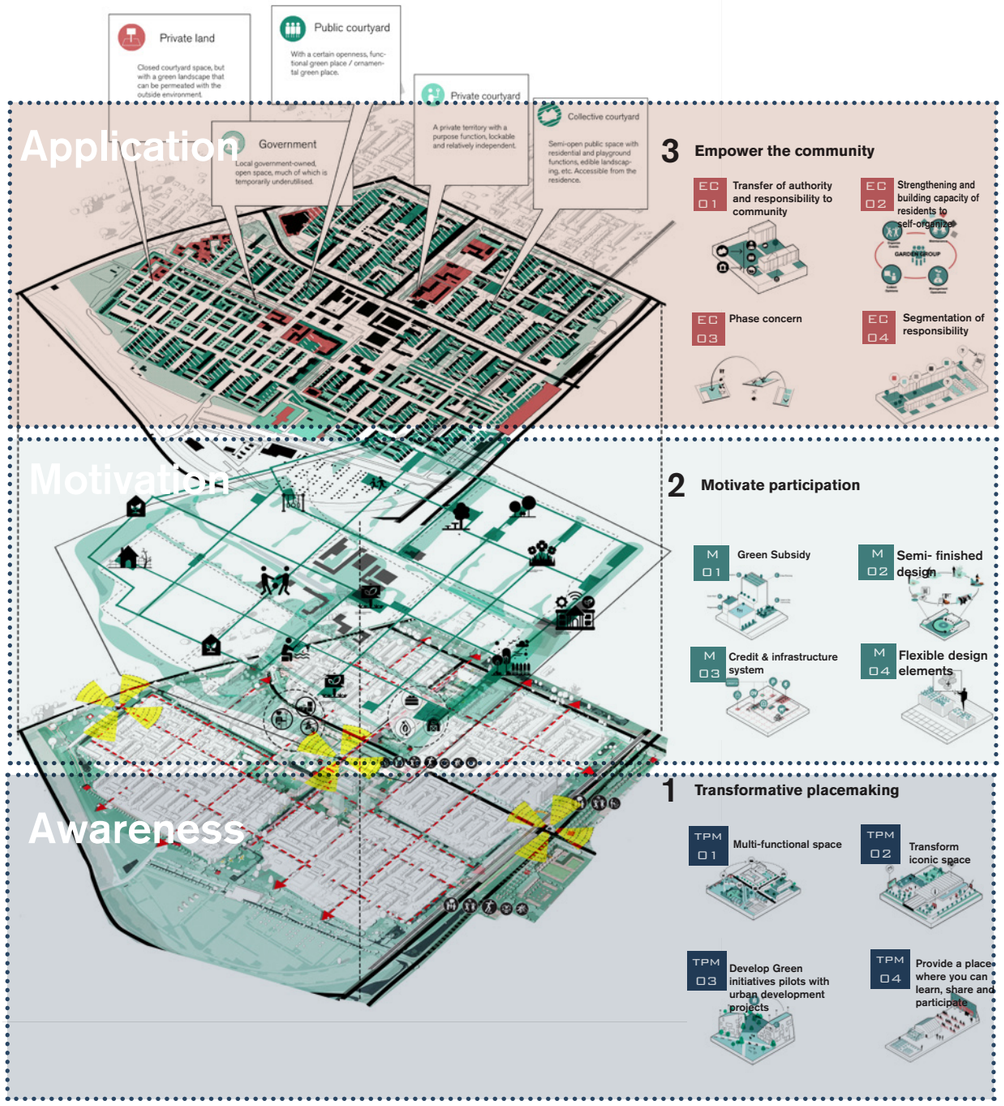
Before

Pic 6.3.3.2 Envison the future public space

Sorce: Illustrated by author,

6.4 Conclusion

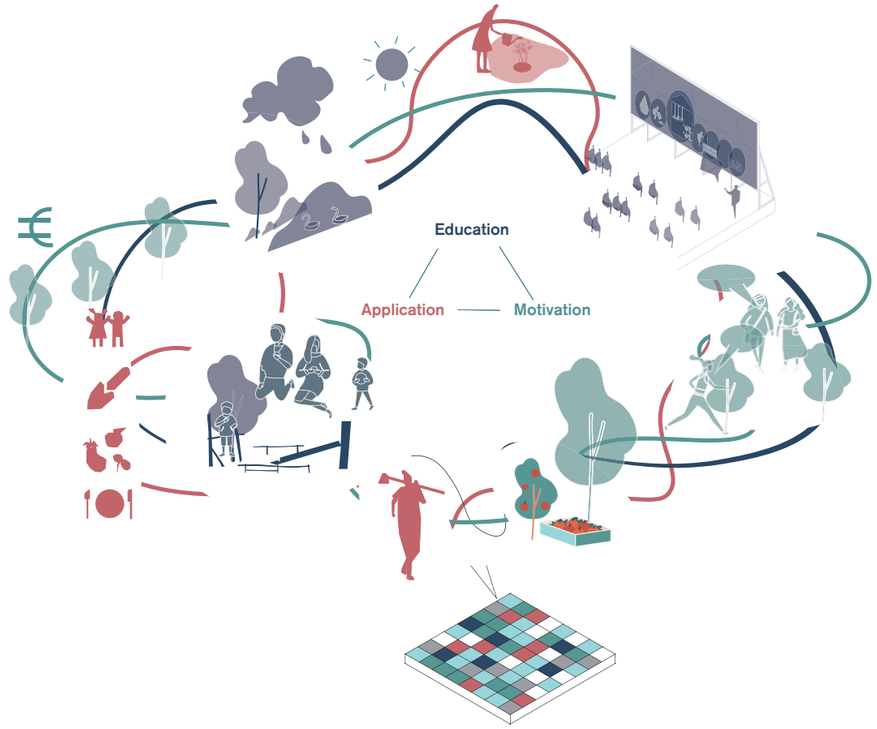
The project has three tracks to create a participatory landscape. They are: in the first track, transformative place-making to increase social awareness; in the second track, motivation to participate through public policies, design tools, and the improvement of infrastructure systems; and in the third track, community empowerment through strategies such as the transfer of power and responsibility, the creation of garden operating organizations, phased development and the breakdown of responsibility zones.



Pic 6.4.1 Spatial framework for three tracks

Sorce: Illustrated by author,

We can imagine a future urban landscape system in which there are more kinds of green spaces for activities such as ecological education, production, events, games, participation, etc.



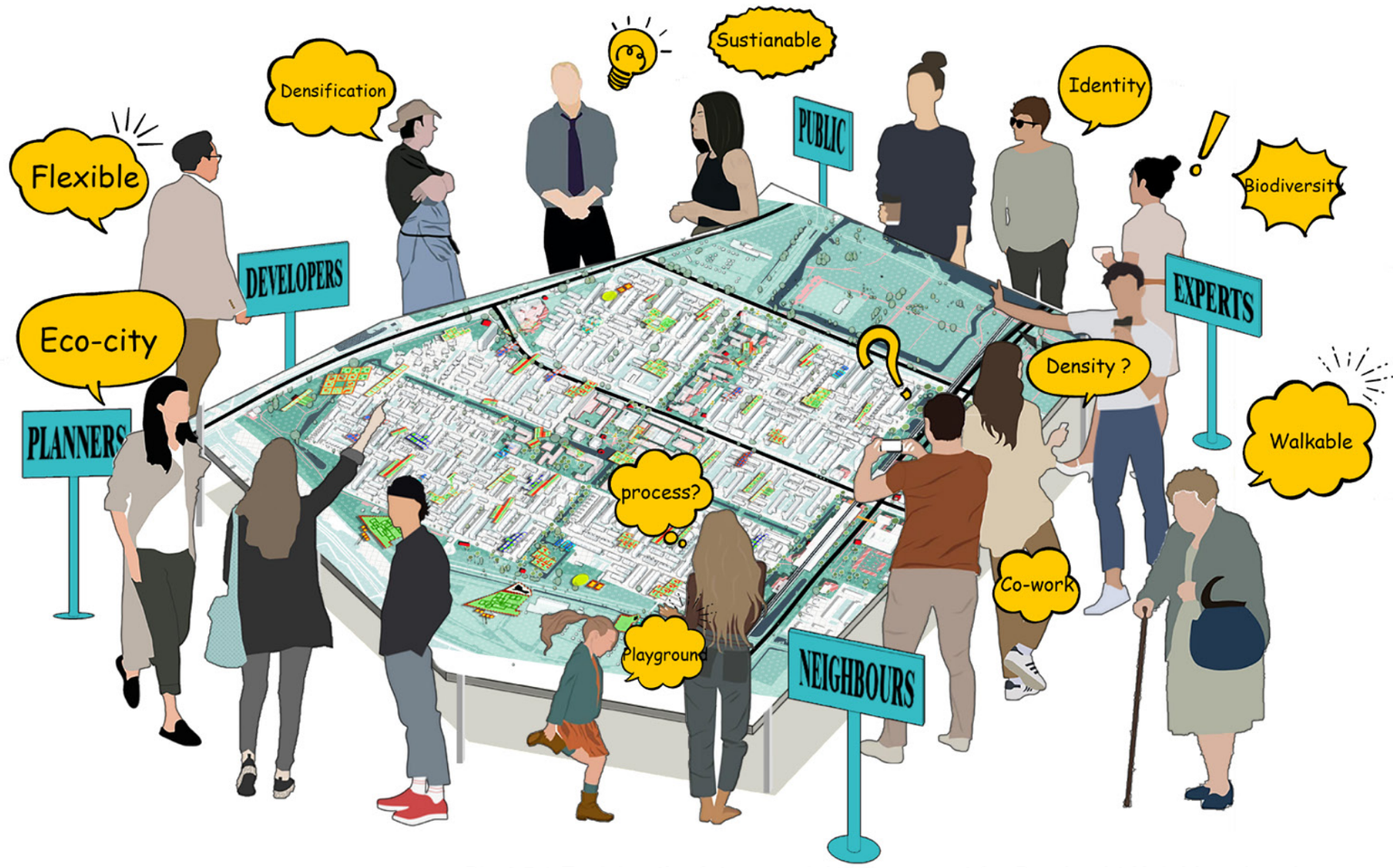
Pic 6.4.2 Demonstration of the concept of 'participatory landscapes'

Sorce: Illustrated by author,

6.5 Design consequences

A. A broader social engagement

We can imagine a future urban landscape system in which there are more kinds of green spaces for activities such as ecological education, production, events, games, participation, etc.; more infrastructure to assist these functions; and more people - residents, visitors, entrepreneurs, landowners, gardeners - willing to participate in the maintenance of the urban landscape.



Pic 6.5.1 Envision the future social engagement for Pendrecht Neighbourhood

Sorce: Illustrated by author,

B. Social groups are involved in various green initiatives and have inspired different activities

These initiatives combine the benefits of urban agriculture, social programs, edible landscape, and eco infrastructure. Not only do they offer employment, educational activities, seasonal picking events, and other projects, they also inspire the creation of various social events. These green initiatives are interwoven with the original landscape structure to create a diverse landscape system.

Pic 6.5.2 Envision the future diverse green initiatives

Sorce; Illustrated by author,

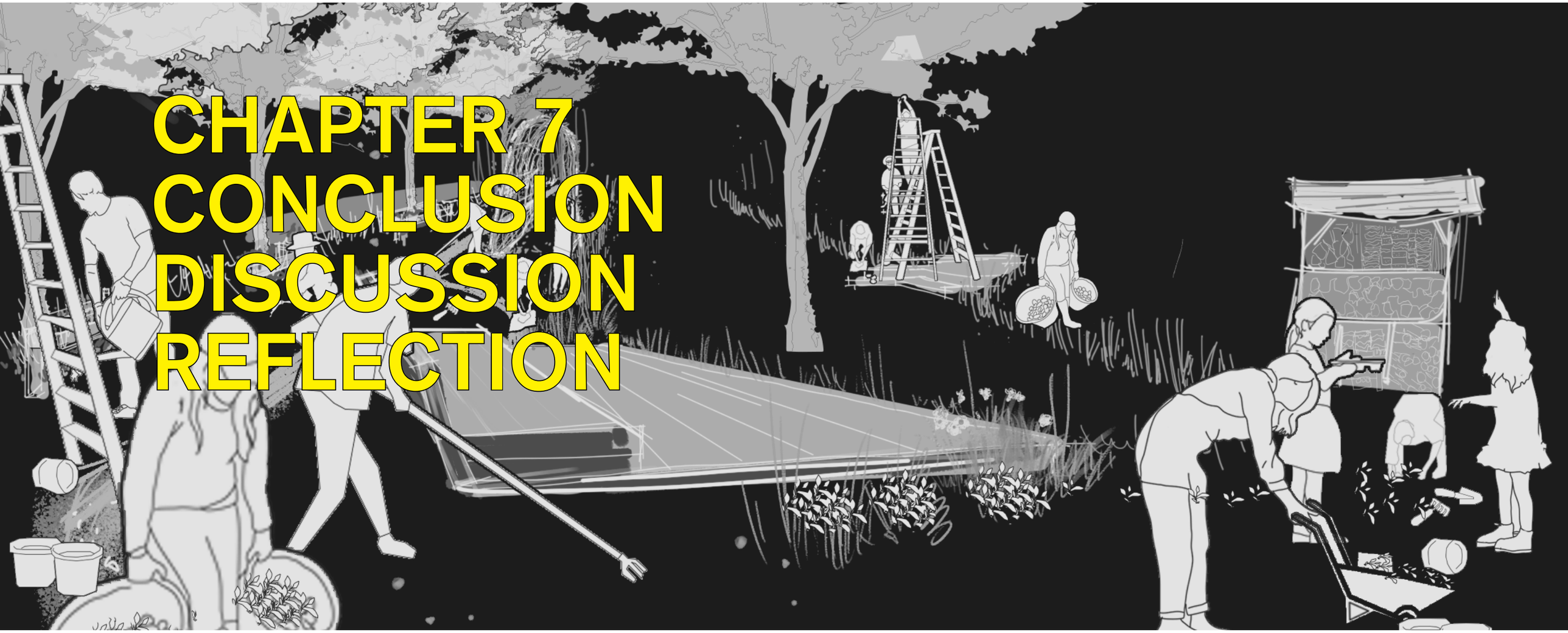
C. Urban ecology and biodiversity be improved

The green corridors of the formerly urban-fringe neighbourhoods of Penderecki are reactivated and the functional axes of the city centre are given a new ecological function. They become a strong connection between social and ecological life.

legends

Pic 6.5.2 Envision the future Ecological connection

Sorce: Illustrated by author.



CHAPTER 7
CONCLUSION
DISCUSSION
REFLECTION

7.1 Conclusion

The main objective of the project is to consider how to stimulate the participation of a wider social group in the improvement of the urban environment with nature-based solutions from the perspective of urban planning and urban design. In order to answer this question, the project research design is divided into three main dimensions, social participation, spatial strategies, and the impact of spatial strategies on urban liveability and sustainability.

In the first dimension, the project explores how to understand the complexity of social participation, the stakeholder groups involved in the project and what are the barriers to their participation in NBS. The project looks at social participation in NBS to improve the urban landscape as a series of behaviors. In social psychology research, there are three necessary conditions for effective behavior to be established, are the knowledge level　what to, why　, the desired level (want to), and the skill level (how to), and the absence of anyone of them will lead to the failure of the behavior. The barriers to participation summarised through the case studies and the literature review do also fall into these three dimensions. They, therefore, suggest a new way of thinking about the project, and the planning design logically looks to break down the barriers to participation at these three levels. These are the knowledge level, which corresponds to how the plan is designed to raise social awareness of NBS; the desired level, which is designed to motivate participants; and the technical level, which is designed to assist residents in their participation. The strategy of the project is also based on the three levels of social awareness, motivation, and implementation.

At the second dimension, the strategies are explored in relation to the three main focuses summarised at the first dimension, the generation of which combines the application of the theory of sustainable and sustainable transformation with the lessons learned from the case studies.

track 1 is transformative placemaking to enhance social awareness. Transformative placemaking refers to the creation of an iconic space or landscape that redefines the meaning of place and socio-spatial identity. This type of space helps to draw attention to nearby activities, contributes to the penetration of decisions, and enhances the visibility of transformation. Thinking about this type of place-making is to create multifunctional ecological places in conjunction with existing spaces for social and cultural activities, to create iconic places, to integrate urban development projects, or to create places where learning can be shared and educated.

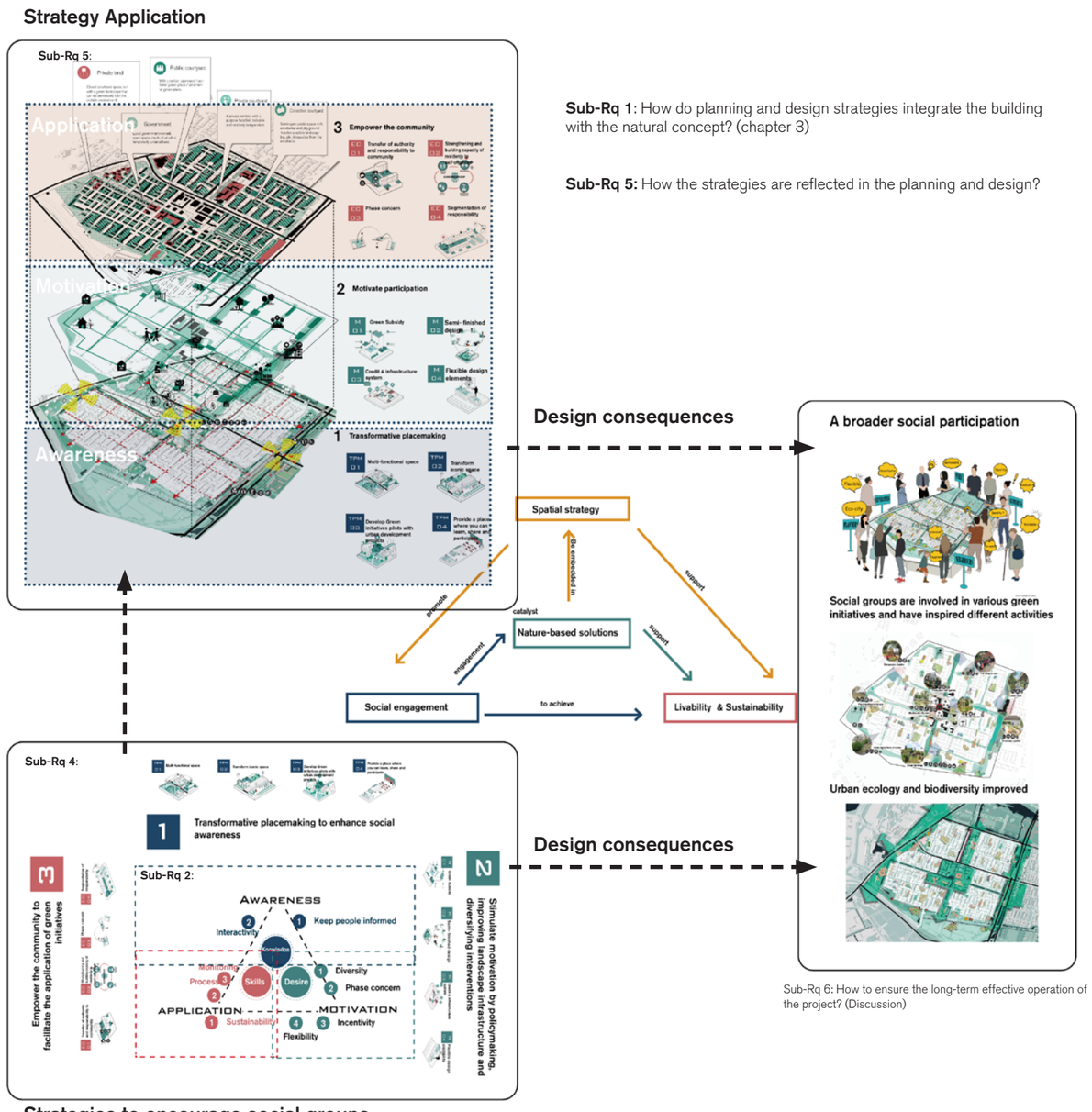
Track 2 is to Stimulate motivation by policymaking, improving landscape infrastructure, and diversifying interventions. If participation in NBS is closely linked to social and environmental contribution to If participation in NBS is closely linked to its contribution to society and the environment, as well as to people's daily lives, then participation will not only be an option to protect the environment, but will be linked to social recreation, and even to production and life, and participation will then become a more active option. The corresponding strategies in this TRAck are green subsidies, the provision of diverse and semi-finished spaces, flexible green design elements, and the improvement of green infrastructure, which aim to lower the threshold of participation as well as being a motivating factor for participation.

track 3, for empowering communities to renew themselves. The project considers that as more and more people in the community see the benefits of NBS in terms of environmental and livelihood benefits, more people will want to join the movement. The strategy is to ensure that residents are empowered and that NBS can be implemented effectively, responding to this through the transfer of responsibility, the establishment of garden groups, the subdivision of responsibility blocks, and the phased development.

On the third dimension, the strategy is applied to the pendrecht neighborhood with design interventions and the interpretation of spatial scenarios. They describe an innovative process of democratic planning. In the future, local residents, planners, experts, authorities, and developers will form a multidisciplinary team. Everyone can be involved in the improvement of the urban landscape. Green initiatives combine the benefits of urban agriculture, social projects, edible landscapes, etc., not only inspired the creation of various social activities, effectively combating social isolation and community social activities, effectively combating social isolation and community insecurity, but also providing many employment opportunities. As the environment improves, the area becomes vibrant, attracting new investment and new occupants, and the transformation of the participatory landscape takes place.

Pic 7.1.1 Conclusion the main result of project

Sorce: Illustrated by author,



Sub-Rq 1: How do planning and design strategies integrate the building with the natural concept? (chapter 3)

Sub-Rq 5: How the strategies are reflected in the planning and design?

Sub-Rq 6: How to ensure the long-term effective operation of the project? (Discussion)

Sub-Rq 2: How to understand the **complexity** of social participation in NBS?
Sub-Rq 3: What kind of stakeholder groups are involved in the project ? **(section 4.3)**
Sub-Rq 4: What are the planning strategies that respond to participation gaps?

7.2 Discussion

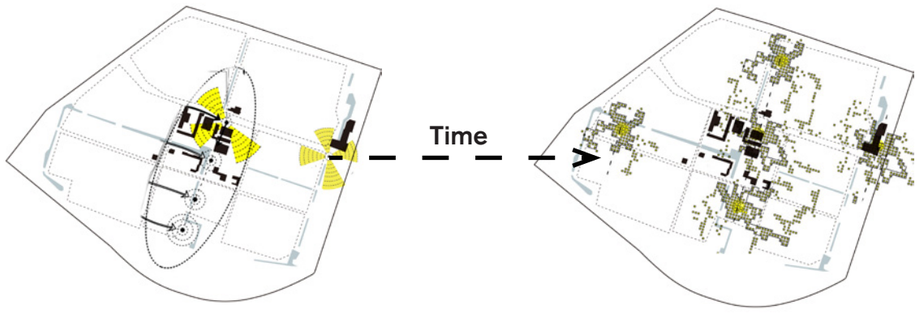
Sub-Rq6 **Sub-Rq 6: How to ensure the long-term operation of the project?**

A.long-term perspective

Firstly, the participatory landscape transformation should be based on the general urban situation, with the effect that the community draws on external forces to develop and grow itself and to trigger a process of social integration. Given the local socio-economic difficulties, public policies and external incentives are seen as the main catalysts for this transformation.It is also on the basis of this reflection, combined with the **theory of sustainable transformation (section 2.5.2)**, that the transformative placemaking of track 1 was developed.

Pic 7.2.1 Expected outcome of transformative Green initiatives

Sorce: Illustrated by author,



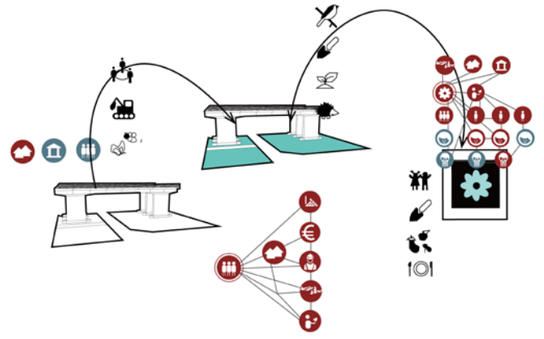
Connectivity and activation of urban nodes

Spread of influence

Secondly, in the process of transformation, an **open urban structure** should be maintained. This refers to the fact that there is a lot of uncertainty in both social participation and sustainable transformation, such as the negotiation and game of interests involved in the process, while the project seeks to reach an integrated common understanding and common action. Planning and design are therefore not about the final vision, but rather towards a potential facilitating structure, integrated with possible future scenarios.

B. The formation of effective participation networks

In the process of promoting participation, the green initiatives shift in nature from formal (urban policy) to informal (community placemaking). The issue at this stage is how to form effective alliances between government, social organizations, businesses, and residents. In this project, the planner acts as the facilitator, while the various collaborative and community organizations act as the main medium for stakeholder linkages. However, further research is needed on how to set up a network of participants and how to form stronger, more cohesive, and effective networks.



Pic 7.2.2 How to form an effective network of participants

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C. Public control and governance

More social participation also means more investment of private resources, and with this comes a greater sense of territoriality. But we do not want unauthorised development to lead to widespread private property speculation, nor should we avoid the privatisation and closure of otherwise public spaces, which can create more spatial segregation. Public control and governance are therefore essential in the process of social participation.

Pic 7.2.3Avoiding the privatization of public space

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D. Monitor the condition of green initiatives

How to ensure that green inititive reflects respect for nature and the environment is key to sustainable development. Here we can consider various concrete or visual ways to assess these environments. For example we could apply the NL greenlabel, a series of indicators used to assess the sustainability of a site. This allows us to target improvements to the site more specifically and can also be used to evaluate the subsequent development of the project.s.

NL Greenlabel

Pic 7.2.4 NL green label

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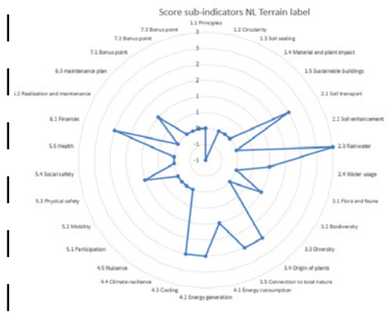
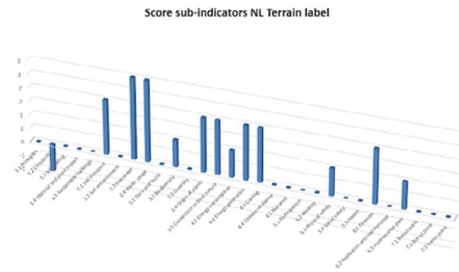
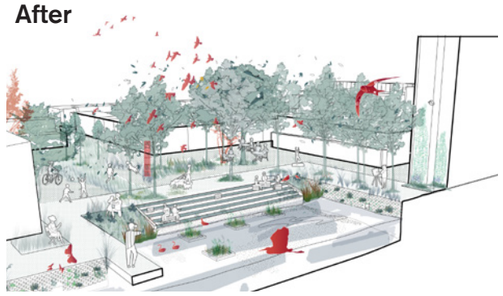
Pic 7.2.5 Example of NL green label tool

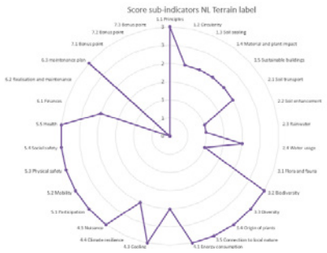
Before

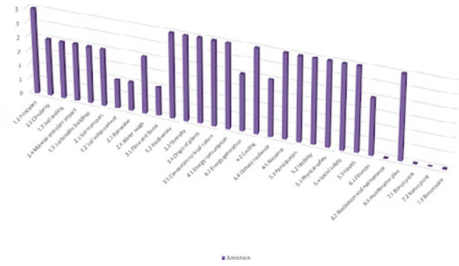




After







7.3 Reflection

7.3.1 Societal relevance

The social relevance of this project can be summarised in two ways: firstly, by focusing on sustainable urban regeneration in problematic areas, and secondly, by building bridges between social participation and nature-based solutions in order to seek wider participation.

1. Sustainable urban regeneration in problematic areas

Problematic urban areas such as the pendrecht are characterized by many social complexities and contradictions. With the decline of economic dynamism, spatial degradation due to the deterioration of environmental and infrastructural quality, the ensuing environmental insecurity and violence, the departure of high-income groups, and the concentration of vulnerable groups, the city is caught in a serious vicious circle. Two reflections on this type of urban regeneration project are proposed, the first being that the involvement of multiple parties is an important factor in rebuilding urban cohesion. Firstly, the strong potential and self-development of residents is an important weapon against insecurity. And through informal participation, residents leave their mark on the site, reshaping the meaning and identity of the place, concluding the occurrence of social relations, and contributing to the formation of social cohesion. The second is that of a progressive rhythm of regeneration and development. Sustainable urban regeneration can be understood as the reactivation and reconnection of urban nodes. In this process, excessive external interventions that lead to dramatic changes in the internal environment of the community, such as social equity, or gentrification, are avoided. An effective balance between external and internal forces, as well as more open and fair means of governance, therefore need to be considered in this process.

2. Building bridges between social participation and nature-based solutions

when we want the community to be more widely involved in NBS to improve the urban environment. Participation here refers to actions related to material financial giving, behavioral commitment, guidance and advice, promotion, emotional interaction, etc. However, there may not be sufficient urgency for these behaviors among the pendrecht community, given the other realities of economic life. Therefore, with regard to the part on motivating participation, strategies such as public action, incentives, etc. are needed in the early stages of the project to link participation to more aspects of productive life, which have become the motivation for subsequent participation.When faced with thinking about other social participation topics, we can also consider how to increase the relevance and urgency of participation.

7.3.2 Advantages and limitations of the chosen methodology

Throughout the history of landscape development, top-down landscaping, which is relatively devoid of social participation, has had the advantage of short decision-making cycles and quick start-ups and has been instrumental in improving the urban landscape agenda. But with a critical eye, this approach has brought some undesirable consequences. This project is based on the importance of social participation in the landscape and other areas such as placemaking and decision making. Thus, it can be said that the project is based on the assumption that sustainable landscape development requires the attention and participation of residents and the wider community, but that the problem with the landscape is that participation is somehow hindered.
Therefore, based on this assumption, the central question to be addressed in the methodology is,how to understand the complexity of participation ? And What are the planning and design strategies that respond to participation gaps?

- Strengths

In response to these two questions, the project has taken an innovative approach to social psychological research on behavior in order to dissect the three dimensions of participation. These three elements are then translated into the main issues of social awareness, motivation, and application that the urban strategy will focus on. Various measures and design approaches under the three tracks work together to support effective participation behavior.

- Limitation

Firstly this combination of behavioral science and urban planning did not find actual examples and therefore the interpretation of the project may be too subjective in this respect. Secondly, when studying the current barriers to participation, qualitative sociological research methods were used (photographs, documents, case studies, videos, etc.), but due to time constraints and pandemic influences, there were few specific interviews with local residents. Reflecting on the need for future participatory planning to be more closely rooted in the local context and to truly consider the thoughts and feelings of the residents.

7.2.3 Ethical issues and dilemmas encountered in doing the research

Many ethically relevant values were considered, such as the needs of local residents, an open and participatory planning process, and the acceptance of different views and concerns about NBS. However, these do not fully reflect the reality of the issue. For example, whether the priority concerns of the community are environmental or economic, and what the stakeholders think about the planning decisions of the project. This requires more negotiation and gaming, but in this design, a relatively ideal situation is considered.

7.2.4 Potential applications of the results in practice

Uncertainty of long-term implementation

Since promoting social participation requires long learning and finding process, the possibility of setbacks cannot be ruled out. It is therefore important that as many community groups as possible begin this participatory process, especially with their exchange of experiences, and with adequate external support.

Equity protection for upfront engagement stakeholders

Many practical cases mention that strategies to promote direct participation in urban ecological landscapes seem to be associated with high costs, but overcoming the resistance to upfront investment seems to be worthwhile if we consider the more far-reaching impacts of the participation strategy. This also implies whether the drivers of the stakeholders involved upfront are secured, such as their investment and return, and whether the operations to maintain the landscape are sound.

Possible Gentrification Issues Raised

Although the paper mentions that green infrastructure development that lacks social participation has some potential for green gentrification. But as mentioned in the strategy, the pre-stimulated participation needs to be stimulated by external forces. If the situation is ideal, the richness of the landscape and the attractiveness of the public space in the area will be enhanced, which will indirectly bring about the improvement of the quality of life in the area, which may subsequently attract different groups of people to move in, slow urban renewal, with the increase of land price. Therefore, how to protect the interests of the vulnerable groups in this process, such as reasonable control of rents, etc.

- possible problems that occurred during data collection and how one tried to overcome or compensate for these problems.

Based on the project's hypothesis, and subsequent research, the question regarding landscape development generally seems to be why participation in landscape development is hindered. At this stage, the problems identified can be mainly focused on, the division of power and responsibility, participation pathways, knowledge gaps, and stakeholder concerns, but for specific site designs, this analysis may be generally due to and less targeted. In the case of the actual project, a more in-depth study of the local context is still needed.

Residents' identification with the living landscape is a relatively abstract concept, so both descriptive research and participatory design are subject to certain selection bias. Therefore, design to promote participation and change the idea of landscape identity is a long-term process that requires constant adjustment of strategies.

In terms of planning and design for biodiversity, species selection, vegetation mix, etc., most of the data come from suggestions of existing cases, or this data is simplified and left blank, so more communication with professional scholars such as ecologists and horticulturists are needed to ensure the rationality of the proposal.

The idea of the operation model is also a rough idea based on existing cases and innovative thinking, and its effectiveness requires the support and cooperation of many departments.

7.2.5 Transformability of the project

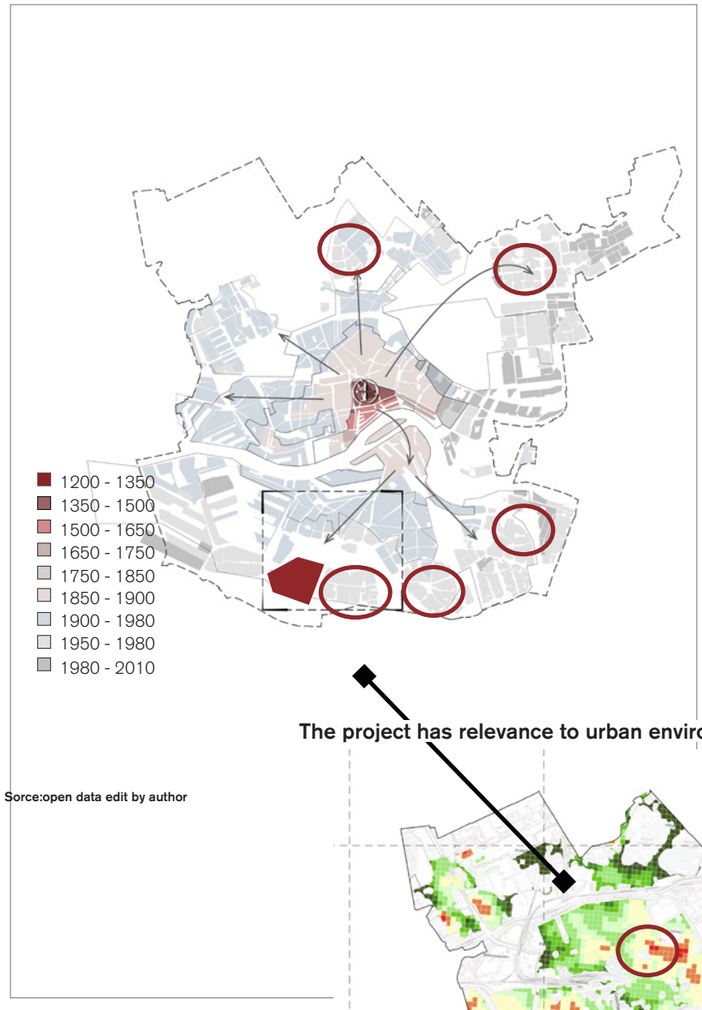
In terms of the theme of the project, 'Towards participatory landscape' aims to create a community environment where residents can engage in NBS activities. It uses citizens to take ecological action in their daily lives, actively initiate green practices, create networks of participants, change lifestyles, and contribute to turning around urban problems.

Overall, the project represents a progressive process of sustainable urban transformation thinking, from activation and connectivity of urban nodes to public sector policy and infrastructure improvement to empowering communities to achieve a balance from top-down to bottom-up. The transformative theme of this focus is urban ecology, but this thinking can also be applied to other sustainable transformations such as energy, transport, and other directions.

In terms of urban space, the main focus of the design is on cities that are facing development difficulties. In these urban spaces, the use of external stimuli to stimulate the community's vast internal resources for community participation and self-renewal is seen as a breakthrough in the project. This has implications for communities or urban spaces facing similar challenges. In the case of Rotterdam, post-war reconstruction areas such as Zuidwijk, Lombardjen, Schiebroek, and others face similar dilemmas. Similar planning approaches can be applied to these urban environments.

In terms of design characteristics, this study provides a useful approach to similar community-led initiatives in terms of enhancing the utility of NBS for multiple spaces, combining multifunctional spaces, providing 'semi-finished spaces', subdividing responsibility blocks, and opening them in phases. initiatives to provide spatial design strategies that can be applied to similar community-led initiatives.

Pic7.2.5.1 Trasnformability of the project in Rotterdam



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REFERENCES

References

Alliance, C. (2007). Liveable Cities: The Benefits of Urban Environmental Planning-A Cities Alliance Study on Good Practices and Useful Tools.

Bush, J., & Doyon, A. (2019). Building urban resilience with nature-based solutions: How can urban planning contribute? Cities, 95, 102483.

Bryson, J. (1995) Strategic Planning for Public and Nonprofit Organizations (rev. edn), San Francisco, CA: Jossey- Bass. Latest edition Strategic Planning for Public and Nonprofit Organizations: A Guide to Strengthening and Sustaining Organizational Achievement (Bryson on Strategic Planning).
Source: Stakeholder Analysis | Definition and best method https://www.stakeholdermap.com/stakeholder-analysis.html#bryson

Black, K. J., & Richards, M. (2020). Eco-gentrification and who benefits from urban green amenities: NYC's high Line. Landscape and urban planning, 204, 103900.

Buchecker, M., Hunziker, M., & Kienast, F. (2003). Participatory landscape development: overcoming social barriers to public involvement. Landscape and urban planning, 64(1-2), 29-46.

Castells, M. (2002). Livable cities?: Urban struggles for livelihood and sustainability. Univ of California Press.

Cohen-Shacham, E., Walters, G., Janzen, C., & Maginnis, S. (2016). Nature-based solutions to address global societal challenges. IUCN: Gland, Switzerland, 97.

Covey, S. R. (2004). The 7 habits of highly effective people: Powerful lessons in personal change. Simon and Schuster.

Eraydin, A. (2013). "Resilience Thinking" for Planning. In Resilience thinking in urban planning (pp. 17-37): Springer.

Exploring Opportunities for Green Adaptation in Rotterdam (2012). Retrieved from https://edepot.wur.nl/243174

Ferreira, V., Barreira, A. P., Loures, L., Antunes, D., & Panagopoulos, T. (2020). Stakeholders' Engagement on Nature-Based Solutions: A Systematic Literature Review. Sustainability, 12(2), 640.

Frantzeskaki, N. (2019). Seven lessons for planning nature-based solutions in cities. Environmental Science & Policy, 93, 101-111.

Frantzeskaki, N., & Tilie, N. (2014). The dynamics of urban ecosystem governance in Rotterdam, The Netherlands. Aambio, 43(4), 542-555.

Frantzeskaki, N., Van Steenbergen, F., & Stedman, R. C. (2018). Sense of place and experimentation in urban sustainability transitions: the Resilience Lab in Carnisse, Rotterdam, The Netherlands. Sustainability science, 13(4), 1045-1059.

Frantzeskaki, N., & Tilie, N. (2014). The dynamics of urban ecosystem governance in Rotterdam, The Netherlands. Aambio, 43(4), 542-555
.
Fraefel, U. (2014, November). Professionalization of pre-service teachers through university-school partnerships. In Conference Proceedings of WERA Focal Meeting, Edinburgh.

Gehrels, H., van der Meulen, S., Schasfoort, F., Bosch, P., Brolsma, R., van Dinther, D., . . . Kok, S. (2016). Designing green and blue infrastructure to support healthy urban living. Retrieved from

Gould, K. A., & Lewis, T. L. (2018). From green gentrification to resilience gentrification: an example from Brooklyn 1. City & Community, 17(1), 12-15.

Gould, K. A., & Lewis, T. L. (2018). From green gentrification to resilience gentrification: an example from Brooklyn 1. City & Community, 17(1), 12-15.

Gould, K. A., & Lewis, T. L. (2018). From green gentrification to resilience gentrification: an example from Brooklyn 1. City & Community, 17(1), 12-15.

Back, P. (2020) Getting more Green: Smaller municipalities' approaches to delivering green infrastructure [Video file]. (2020). Retrieved 2020, from https://www.youtube.com/watch?v=atPveY-xNpQ

Godschalk, D. R. (2004). Land use planning challenges: Coping with conflicts in visions of sustainable development and livable communities. Journal of the American Planning Association, 70(1), 5-13.

Gough, M. Z. (2015). Reconciling livability and sustainability: Conceptual and practical implications for planning. Journal of Planning Education and Research, 35(2), 145-160.

Grin J, Rotmans J, Schot J (eds.) (2010) Transitions to Sustainable Development. New Directions in the Study of Long-Term Transformative Change. Routledge, New York/London

Informing the global standard for Nature-based Solutions. (2019, January 31). IUCN. https://www.iucn.org/news/ecosystem-management/201901/informing-global-standard-nature-based-solutions

Johnson, B. R., & Campbell, R. (1999). Ecology and Participation in Landscape- Based Planning Within the Pacific Northwest. Policy Studies Journal, 27(3), 502-529

Jorgenson, A. K. (2004). Uneven processes and environmental degradation in the world-economy. Human Ecology Review, 103-117.

Kashef, M. (2016). Urban livability across disciplinary and professional boundaries. Frontiers of Architectural Research, 5(2), 239-253.

Keleg, M., Salheen, M., & Latif, M. (2015). LIVEABLE PUBLIC SPACES AS A MEANS FOR LIVEABLE CITIES. In: Abu.

Kleinhans, R., Van Ham, M., & Evans-Cowley, J. (2015). Using social media and mobile technologies to foster engagement and self-organization in participatory urban planning and neighbourhood governance.

Li, F., Liu, X., Zhang, X., Zhao, D., Liu, H., Zhou, C., & Wang, R. (2017). Urban ecological infrastructure: an integrated network for ecosystem services and sustainable urban systems. Journal of Cleaner Production, 163, S12-S18.

Luz, F. (2000). Participatory landscape ecology–a basis for acceptance and implementation. Landscape and urban planning, 50(1-3), 157-166.

Lots of information about neighbourhood Pendrecht. (2021, January 24). AllCharts.Info. https://allcharts.info/the-netherlands/neighbourhood-pendrecht-rotterdam/

Morandín-Ahuerma, I., Contreras-Hernández, A., Ayala-Ortiz, D. A., & Pérez-Maqueo, O. (2019). Socio–Ecosystemic Sustainability. Sustainability, 11(12), 3354.

McDonnell, M. J., & MacGregor-Fors, I. (2016). The ecological future of cities. Science, 352(6288), 936-938.

Matthias Buchecker, Marcel Hunziker, Felix Kienast, Participatory landscape development: overcoming social barriers to public involvement, Landscape and Urban Planning, Volume 64, Issues 1–2,2003,Pages 29-46,ISSN 0169-2046, https://doi.org/10.1016/S0169-2046(02)00199-8. (https://www.sciencedirect.com/science/article/pii/S0169204602001998)

Meijer, J., Shames, S., J, S., & Giesen, S. P. (2018, November). Spatial modelling of participatory landscape scenarios. https://www.pbl.nl/en/publications/spatial-modelling-of-participatory-landscape-scenarios

McPhearson, T., Andersson, E., Elmqvist, T., & Frantzeskaki, N. (2015). Resilience of and through urban ecosystem services. Ecosystem Services, 12, 152-156.

Mees, H.-L. P., & Driessen, P. P. (2011). Adaptation to climate change in urban areas: Climate-greening London, Rotterdam, and Toronto. Climate law, 2(2), 251-280.

Mitchell, M. (2009). Complexity: A guided tour: Oxford University Press.

Mougeot, L. J. (2000). Urban agriculture: Definition, presence, potentials and risks, and policy challenges. Cities feeding people series; rept. 31.

Monumentenverordening Rotterdam 2010. (2021). Monumentenverordening Rotterdam 2010. https://lokaleregelgeving.overheid.nl/CVDR19685/1

Nature Map Rotterdam. (2014). https://deltametropool.nl/publicaties/de-stadsnatuurkaart-van-rotterdam/

Nature-based solutions: Implications on design, planning, governance and economics. (2020, November). [Webniar]. nature-based solutions, online, Delta Alliance Argentinean Wing. http://www.delta-alliance.org/events/10901601/Webinar-NBS-Circular-economy-and-financing-25-Nov-2020

Petrescu, D. (2012). Relationscapes: Mapping agencies of relational practice in architecture. City, Culture and Society, 3(2), 135-140.

Parris, K. M. (2018). Existing ecological theory applies to urban environments. Landscape and Ecological Engineering, 14(2), 201-208.

Pickett, S. T., Cadenasso, M. L., Childers, D. L., McDonnell, M. J., & Zhou, W. (2016). Evolution and future of urban ecological science: ecology in, of, and for the city. Ecosystem health and Sustainability, 2(7), e01229.

Raymond, C. M., Frantzeskaki, N., Kabisch, N., Berry, P., Breil, M., Nita, M. R., ... & Calfapietra, C. (2017). A framework for assessing and implementing the co-benefits of nature-based solutions in urban areas. Environmental Science & Policy, 77, 15-24.

Raymond, C. M., & al, e. (2017). A framework for assessing and implementing the co-benefits of nature-based solutions in urban areas. Environmental Science & Policy, 77, 15-24.

Ruth, M., & Franklin, R. S. (2014). Livability for all? Conceptual limits and practical implications. Applied Geography, 49, 18-23.

Scribbr. (2021, March 29). APA Citation Generator (Free) | References & In-text Citations. https://www.scribbr.com/apa-citation-generator/new/webpage/

Seddon, N., Chausson, A., Berry, P., Girardin, C. A., Smith, A., & Turner, B. (2020). Understanding the value and limits of nature-based solutions to climate change and other global challenges. Philosophical Transactions of the Royal Society B, 375(1794), 20190120.

Staff, T. C. (2020, March 31). Primary stakeholders vs secondary stakeholders - definitions, examples, differences. Termscompared. https://www.termscompared.com/difference-between-primary-and-secondary-stakeholders/

Sustainability, P. F. W. (2020, May 4). Are cities ecosystems—analogous to natural ones—of nature, infrastructure and people? Water-Centric Planning. https://waterbucket.ca/wcp/2018/03/28/are-cities-ecosystems-analogous-to-natural-ones-of-nature-infrastructure-and-people/

Sijmons, D. (2020). Contrast, Contact, Contract; Pathways to Pacify Urbanization and Natural Processes. In Nature Driven Urbanism (pp. 9-42): Springer.

Tillie, N. (2020). From Urban Green Structure to Tidal River in Rotterdam: Testing Grounds for Urban Ecology. In Nature Driven Urbanism (pp. 111-130). Springer, Cham.

Tisma, A. L. E. X. A. N. D. R. A., & Meijer, J. O. H. A. N. (2018). Integral landscape planning in the Netherlands: lessons learned from the intentions and consequences. WIT Trans Ecol Environ, 217, 269-80.

Valcárcel-Aguiar, B., Murias, P., & Rodríguez-González, D. (2019). Sustainable urban liveability: a practical proposal based on a composite indicator. Sustainability, 11(1), 86.

Voskamp, I. M., & Van de Ven, F. H. (2015). Planning support system for climate adaptation: Composing effective sets of blue-green measures to reduce urban vulnerability to extreme weather events. Building and Environment, 83, 159-167.

Von Wirth, T., Fuenfschilling, L., Frantzeskaki, N., & Coenen, L. (2019). Impacts of urban living labs on sustainability transitions: Mechanisms and strategies for systemic change through experimentation. European Planning Studies, 27(2), 229-257.

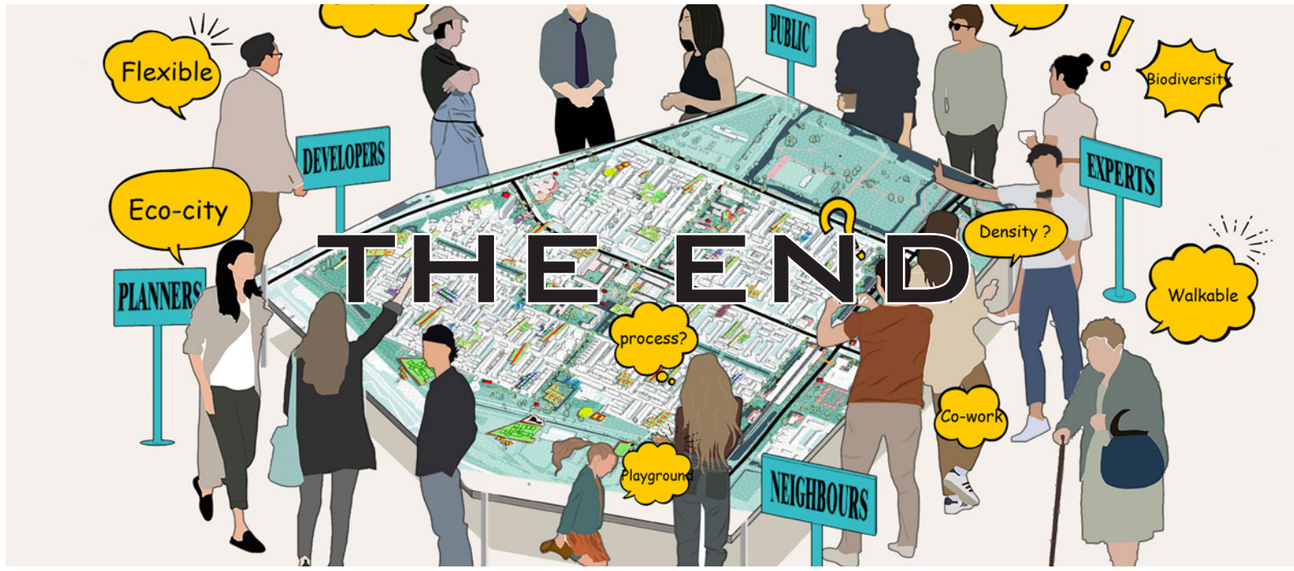
Vujcic, M., Tomicevic-Dubljevic, J., Grbic, M., Lecic-Tosevski, D., Vukovic, O., & Toskovic, O. (2017). Nature based solution for improving mental health and well-being in urban areas. Environmental Research, 158, 385-392.

WCED, 1987WCED (World Commission on Environment and Development), 1987. Our Common Future. Oxford University Press, Oxford.

Working together on rich Rotterdam urban nature. (2021b). http://www.urbanisten.nl/wp/wp-content/uploads/UB_RAS_EN_lr.pdf

Wikipedia contributors. (2020, November 27). Rotterdam. Wikipedia. https://en.wikipedia.org/wiki/Rotterdam

Wikipedia contributors. (2021, March 18). Nature-based solutions. Wikipedia. https://en.wikipedia.org/wiki/Nature-based_solutions



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