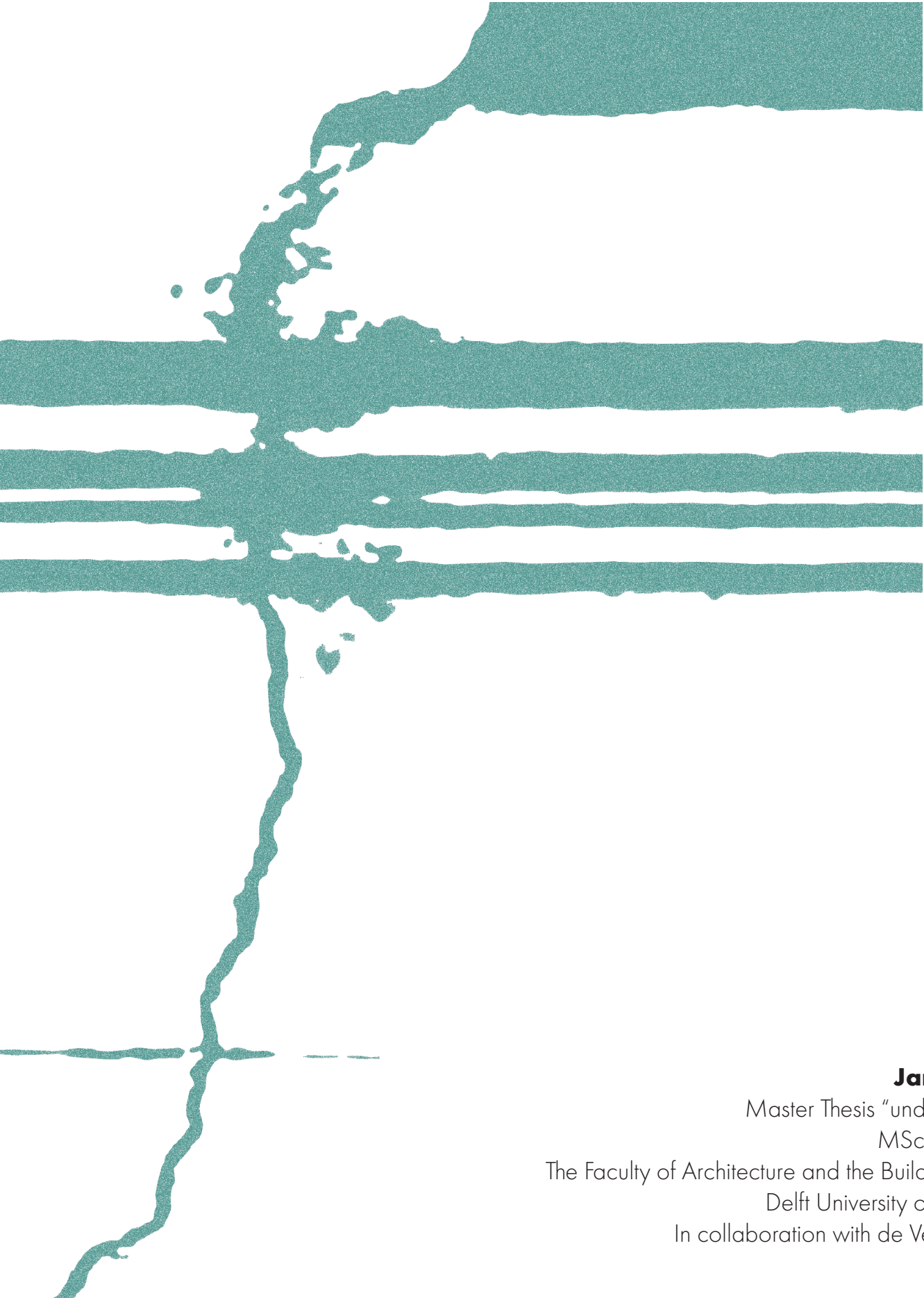


undisplacement

replacing houses not communities



Jan Kwaśnik

Master Thesis "undisplacement"

MSc. Architecture

The Faculty of Architecture and the Build Environment

Delft University of Technology

In collaboration with de Veldacademie

Welcome to Bloemhof

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September 2024 - May 2025



abstract

How can addressing the problem of sinking buildings create opportunities for restructuring Bloemhof neighbourhood in line with the needs of its community?

The Bloemhof neighbourhood in South Rotterdam faces a critical challenge due to severe soil subsidence, leading to the structural failure of many buildings. This research explores how addressing subsidence can serve as a catalyst for sustainable urban transformation while prioritising community continuity and resilience. Unlike conventional redevelopment approaches that often result in displacement, this study introduces the concept of "undisplacement", which seeks to replace housing while preserving the neighbourhood's social fabric.

By analysing Bloemhof's historical, architectural, and social context, this research identifies the primary causes of urban degradation and proposes a series of focus points like: leveraging architectural identity and community participation to shape redevelopment, and implementing phased renewal to minimise disruption and displacement. Drawing from urban planning theories and case studies of resilient neighbourhoods, the study advocates for an approach that integrates adaptive construction techniques, material reuse, and ecological resilience.

The findings highlight the importance of bottom-up urban planning, where residents play an active role in shaping their neighbourhood's future. The study ultimately argues that Bloemhof renewal should not only address its physical deterioration but also serve as a model for equitable and sustainable urban regeneration.

undisplacement

The state of being undisturbed from one's original position.

The condition of maintaining, regaining, or restoring one’s original place, position, or status without being moved, replaced, or permanently uprooted. This concept is particularly significant in contexts where individuals or communities face displacement due to conflict, natural disasters, environmental degradation, urban development, or other crises.

It encompasses both the prevention of displacement—ensuring that people are not forcibly removed from their homes or lands—and the efforts to return displaced individuals or communities to their original locations. Undisplacement might also involves restoring their pre-displacement way of life, including access to resources, social networks, cultural heritage, and economic stability. The term highlights the importance of preserving the integrity and identity of affected populations while addressing the underlying causes of displacement and supporting sustainable recovery and rehabilitation efforts.

This research explores the “undisplacement method”—a phased construction strategy designed to minimise community disruption. The approach involves developing new building sections incrementally on vacant plots. Residents then relocate to these completed units, enabling their former spaces to be demolished or renovated. This creates a snowball effect: each phase unlocks adjacent areas for renewal, allowing simultaneous regeneration of the urban fabric. Crucially, residents move only once and remain within their existing neighbourhood, preserving social ties and fostering community continuity during transformation.

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chapter - 1

introduction

site overview

“De pistolen moeten de wijk uit” [1]

bloemhof

Bloemhof is a pre-war neighbourhood in Feijenoord, bordered by Putselaan, Hilleliet, Groene Hilledijk, Strevelseweg, and Dordtselaan. It is densely constructed and populated, featuring a mix of social housing and privately-owned homes. [2] The northern section is characterized by porch houses, while the southern part consists mainly of low-rise buildings. Lange Hilleweg serves as the main artery, dividing these two distinct areas. Bloemhof is notable for De Kiefhoek, designed by architect J.J.P. Oud. [3]

history

Bloemhof emerged in the early 20th century as Rotterdam's ports expanded, attracting workers from North Brabant and Zeeland, and later other migrants. [4] It has evolved into a multicultural community representing over 150 different nationalities. Approximately 80% of its 14,000 residents have diverse cultural backgrounds. [5] The neighbourhood can be divided into three parts: north, middle and south. As explained in following chapters, the part that has the biggest problems that are my concern is the south and I will focus this research on it.

reputation

Bloemhof, like its neighbouring districts, has a reputation as a problem area. It was previously ranked fourth in a top 20 list of problematic neighbourhoods in the Netherlands. [2] Groups of loitering youth often cause disturbances in public squares, vandalise residents' property, engage in harassment, and occasionally resort to violence against police and other emergency personnel. [1]



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- [4] “Bloemhof (Rotterdam),” Wikipedia. 28-Dec-2024.
- [5] “Buurt Bloemhof (gemeente Rotterdam) in cijfers en grafieken.” [Online]. Available: <https://allecijfers.nl/buurt/bloemhof-rotterdam/>. [Accessed: 24-Feb-2025].



main topic

“In de Rotterdamse wijk Bloemhof zakken duizenden woningen weg in de bodem.” [6]



foundations

Many buildings in Bloemhof were constructed in the early 20th century using outdated methods and materials that are not suited for the region’s soft, marshy ground. [7] These structures often have shallow foundations that are insufficient for the area’s geotechnical conditions. As a result, these buildings are vulnerable to subsidence, which causes ongoing structural issues. [8] Short-term repairs, are costly and often ineffective, leading to a cycle of continuous temporary fixes rather than long-term solutions. [2] This leads to problems such as cracked walls, uneven floors, and misaligned structures. [8] Subsidence not only impacts the structural integrity of the buildings but also contributes to poor living conditions, making it difficult to improve the housing quality in the area. [3]

affordability

As a low-income neighbourhood, many residents cannot afford the necessary repairs or relocation, adding another layer of complexity to the situation. [9] Despite the strong sense of community, there is growing anxiety among residents about the future of their homes, as they face the uncertain prospect of living in increasingly unstable conditions. [10] The area with the biggest issue is Bloemhof South, it is also one where there is very little interventions being made at this point. [9]

safety

Majority of the neighbourhood comes from abroad or has immigrant background. This makes the area in culturally rich but also prone to problems. As the area is far from being well design for modern needs, with issues as heat island effect and lack of public spaces, the feeling of unsafety is strong. [11] Combining it with poor financial situation of the majority of its residents, it builds an environment that has multiple social difficulties.



references:

- [6] “In de Rotterdamse wijk Bloemhof zakken duizenden woningen weg in de bodem,” 10-Oct-2023. [Online]. Available: <https://nos.nl/regio/zh-rijnmond/artikel/444736-in-de-rotterdamse-wijk-bloemhof-zakken-duizenden-woningen-weg-in-de-bodem>. [Accessed: 26-Feb-2025].
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- [3] “Bodem in Bloemhof zakt.” [Online]. Available: <https://www.woonstadrotterdam.nl/bloemhof>. [Accessed: 21-Feb-2025].
- [9] “Home | Bloemhof Zuid.” [Online]. Available: <https://bloemhofzuid.nl/>. [Accessed: 22-Feb-2025].
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TAGS: Feijenoord Trending Architectuur Artikel

11 oktober 2023 16:41


In Rotterdam-Zuid in de wijk Bloemhof verdwijnen duizenden woningen langzaam onder straatniveau. In de afgelopen honderd jaar zijn huizen al 80 centimeter gezakt en het einde is nog niet in zicht. De gevolgen zijn merkbaar: scheve huizen, scheve vloeren, scheve stoepen, scheuren in gevels. Ook stank en schimmel in woningen, en wateroverlast bij hevige regen. De gemeente Rotterdam waarschuwt dat ingrijpen noodzakelijk is, alleen is nog onduidelijk hoe deze megaklus te klaren.

Bewoners die uit verzakkende wijk willen verhuizen zien de bui al hangen: ‘Google maar eens op onze wijk’

Verrast, ongerust en sceptisch. Honderden woningeigenaren in de Rotterdamse wijk Bloemhof maken zich - na een alarmerende brief van de gemeente - grote zorgen over hun huizen. ‘Ik maak er een paleisje van, maar hoe moet het nu verder?’

Marjolein Kooyman 14-10-23, 12:04

Riolering in Bloemhof is verzakt, kosten aansluiting voor woningeigenaren



TAGS: Feijenoord Trending Wooncrisis Artikel

26 oktober 2023 14:13

Niet alleen woningen zijn aan het wegzakken door de bodemdaling in Bloemhof, ook het riool is verzakt. Het rioleringsstelsel, dat elke 50 jaar moet worden vervangen, kan daardoor niet op de normale manier worden aangepakt. De kosten voor eventuele oplossingen, zoals het (opnieuw) funderen of omhoog brengen van verzakte woningen, zijn voor de woningeigenaren.

TAGS: Feijenoord Samenleving Wooncrisis Artikel

19 juni 2024 17:05

De bewoners van Bloemhof willen niet akkoord gaan met de aangekondigde huurverhoging van 5,5%. Dit komt door achterstallig onderhoud en het verzakken van de woningen. Zij hebben daarom bezwaren ingediend, maar deze heeft Woonstad afgewezen. Door een miscommunicatie lijkt een deel van de mails niet aangekomen te zijn bij de desbetreffende bewoners. Daarom geeft de wooncorporatie hen twee weken extra tijd om hun bezwaar in te trekken.

Wijk met 15.000 bewoners verzakt in hoog tempo: huizen liggen nu al 80 centimeter lager

De Rotterdamse wijk Bloemhof verzakt. En niet zo'n beetje ook. Een ernstig probleem, en makkelijke oplossingen zijn er niet. ‘We komen nu op een kritiek punt.’

Peter Groenendijk 10-10-23, 18:01 Laatste update: 10-10-23, 18:20

Duizenden huizen in de wijk Bloemhof zakken weg

Tech & Innovatie • 5 mei '24 10:00 • Aangepast op 5 mei '24 22:58

‘Schandalig dat ze olie boren onder 70.000 Rotterdamse huizen’


Auteur: Thijs Baas

Het is schandalig dat er olie wordt geboord onder een stad als Rotterdam, in de bodem onder zeker 70.000 woningen. Dat zegt geoloog en journalist Sam Gerrits in de podcast Rotterdam in de Olie van BNR. ‘Ben je wel lékker? Dat kan gewoon echt niet, ik vind het allemaal ontzettend onveilig.’

TAGS: Feijenoord Trending Wooncrisis Artikel

26 oktober 2023 14:13

Niet alleen woningen zijn aan het wegzakken door de bodemdaling in Bloemhof, ook het riool is verzakt. Het rioleringsstelsel, dat elke 50 jaar moet worden vervangen, kan daardoor niet op de normale manier worden aangepakt. De kosten voor eventuele oplossingen, zoals het (opnieuw) funderen of omhoog brengen van verzakte woningen, zijn voor de woningeigenaren.



dagblad010.nl

Bloemhof heeft te maken met verzakkende bodem


Een deel van Bloemhof heeft te maken met grote verzakkingen, omdat de deels meer dan 100 jaar oude woningen niet onderheid zijn. De grootste problemen zijn in Bloemhof-Zuid, het gebied tussen Lange Hi

drimble

drimble.nl

Geen geld om woningen in slechte staat in Rotterdam-Zuid op te knappen: ‘Dat kan toch niet?’


Geen geld van het Rijk voor het aanpakken van woningen in Rotterdam-Zuid. Gemeenteraadsleden Diederik van Dommelen (VVD) en Co Engberts (PvdA) zijn ziedend. „Klap in het gezicht van modale Rotterdammers.“.. (2024-12-09 08:23:16)



Wijk met 15.000 bewoners verzakt in hoog tempo: huizen liggen nu al 80 centimeter lager

De Rotterdamse wijk Bloemhof verzakt. En niet zo'n beetje ook. Een ernstig probleem, en makkelijke oplossingen zijn er niet. ‘We komen nu op een kritiek punt.’


Peter Groenendijk 10-10-23, 18:01 Laatste update: 10-10-23, 18:20



nos.nl

In de Rotterdamse wijk Bloemhof zakken duizenden woningen weg in de bodem


In Rotterdam-Zuid in de wijk Bloemhof verdwijnen duizenden woningen langzaam onder straatniveau. In de afgelopen honderd jaar zijn huizen al 80 centimeter gezakt en het einde is nog niet in zicht.



www.rijnmondnieuws.com

'TRAGE REACTIE GEMEENTE ROTTERDAM OP BODEMDALING BLOEMHOF' - Waterweg-Actueel


ROTTERDAM- De wijkraad van Bloemhof heeft opnieuw haar zorgen geuit over de aanpak van bodemdaling in de gemeente Rotterdam. In een brief burgemeester en wethouders herinnerde de wijkraad aan een...



www.dehavenloods.nl

Vrijwel de hele wijk Bloemhof is verzakt, de huizen zakken langzaam de grond in


Rotterdam - De wijk Bloemhof zakt langzaam, maar heel zeker, de grond in. Onherroepelijk. En daar zijn géén eenvoudige oplossingen voor. Alleen maar een heel dure oplossingen. En het gaat om duizenden woningen.



www.dehavenloods.nl

Oké, de huizen in Bloemhof zakken dus langzaam de grond in, maar wat nu?


Rotterdam - Duizenden woningen in Bloemhof zakken de grond in. Vrijwel alle huizen in de wijk. Wat nu? Dat is nog onduidelijk. Maar iedereen snapt dat er geen simpele oplossingen zijn. En dat er wél iets moet gebeuren.



www.rijnmond.nl

In de Rotterdamse wijk Bloemhof zakken duizenden woningen weg in de bodem

In Rotterdam-Zuid in de wijk Bloemhof verdwijnen duizenden woningen langzaam onder straatniveau. In de afgelopen honderd jaar zijn huizen al 80 centimeter gezakt en het einde is nog niet in zicht. De gevolgen zijn merkbaar: scheve huizen, scheve vloeren.



www.rijnmond.nl

Huurverhoging 'van de zotte', huurders willen niet meer betalen voor steeds slechtere huizen

Tocht. 's Winters koud. Kapotte ventilatie. Scheuren in plafonds en muren. Scheve vloeren. Huurders in Rotterdam-Bloemhof sommen een waslijst aan gebreken op en vinden dat die steeds met lapmiddeltjes worden opgelost. Ze vinden de aangekondigde huurverh...

10

11



research aim

“While you are looking, you might as well also listen, linger and think about what you see.” [12]

research aim

This study aims to address the challenges posed by soil subsidence in Bloemhof, a vulnerable neighbourhood in South Rotterdam, by developing responsible and sustainable redevelopment strategies. The research focuses on transforming the problem of severe ground sinking, which affects the structural integrity of pre-WWII buildings, into an opportunity for fostering healthy neighbourhood growth.

The primary objective is to create a community-centred process that aligns new development with local needs and identity, thereby minimising the psychological, social, and economic trauma of displacement. This involves ensuring the construction of resilient, flood- and soil-subsidence-resistant structures that residents can see as extensions of their neighbourhood’s identity.

The study will include two steps: leveraging architectural identity and community participation to develop a vision that resonates with residents, and implementing phased development to reduce disruption. By engaging the local community in the planning process, the research aims to create a redevelopment plan that residents feel a part of, viewing the changes as a positive opportunity for improvement.

The project is going to be developed in a context of climate change and housing shortage. Part of this research explores possibilities to reuse materials from demolished buildings. Then, analysing how it can be implemented to make houses more affordable and accessible. As there is a huge need for housing in Rotterdam, the main focus is on both densification of the area and adding greenery to foster its climate resilience.

Ultimately, the goal is to inform later design that is going to be developed as a concept for new master plan and multi-functional buildings, primarily social housing with commercial spaces on the ground floor. This approach, combining this research and later design, seeks to push the discussion about the future of Bloemhof neighbourhood forward and encourage for bold and comprehensive vision.

references:

- [12] E. Wachtel, “A Conversation with Jane Jacobs,” 01-Jan-2002. [Online]. Available: <https://brickmag.com/a-conversation-with-jane-jacobs/>. [Accessed: 26-Feb-2025].



research questions

The research question is followed by sub-questions, those can be read as research objectives.

How can addressing the problem of sinking buildings create opportunities for restructuring Bloemhof in line with the needs of its community?

site analysis

- What are architectural and social characteristics of this neighbourhood?
- What are the main environmental problems in this neighbourhood?
- What are foundation issues and how to work with them?

theory analysis

- What are existing urban strategies for this area and relevant urban theories?
- What are relevant theories and philosophies, and how to use them in the design process?
- What are theories about social resilience that could inform the future planning process?

case studies

- How engaging citizens into design process can foster better community growth?
- How to make better and more environment conscious design by material re-use?
- How similar renewal cases in the Rotterdam worked with their issues?

field analysis

- What are the parties, actors, and stakeholders in Bloemhof?
- What are ownership patterns and its issues?
- What are the needs of the community?

towards the design

- How to answer the needs of the community and other stakeholders?
- How to design architectural scenarios for this neighbourhood?
- How should the timeline of the renewal of this neighbourhood look like?



methods description

“You have to absorb what you see around you, what exists on the land, and then use that knowledge along with contemporary thinking to interpret what you see.” ^[13]

literature review

It is a survey of existing academic and professional publications related to a specific topic. Includes online information and using digital tools to access and synthesise information from various online sources. It involves summarising the findings of previous research.

on-site visits

It involves physically going to the location being studied to gather first-hand information. This method allows for direct observation, informal interviews, and experiencing the environment personally. Idea here is not to go to the site ones but to spend as much time possible to fully emerge in neighbourhood life.

case studies

Case studies are a qualitative research method that involves an in-depth, contextual analysis of a specific instance, event, organisation, or individual. It allows exploring complex issues in great detail. By focusing on real-life contexts, case studies provide valuable insights into specific situations, helping to identify patterns, underlying causes, and potential solutions.

discussion meetings

It means to organise meeting with parties in the neighbourhood and discuss the issues with them. Those meeting might be in person but can be online. Discussions also can be through mail or other communication method.

mapping

It involves creating visual representations of data, such as geographical locations, spatial patterns, and relationships. It also includes other ways of representing data as graphs and charts. Mapping helps to identify and understand the spatial distribution of various elements within a study area.

photography

Taking pictures is a way to observe surrounding in more detail. It means to be more present. Photographing architecture, streets and people, helps to understand the qualities of the neighbourhood and gives material to analyse further on. I spread my pictures through this whole research.

references:

- [13] “An Exploration of Tadao Ando.” [Online]. Available: <https://hellogoodland.com/blogs/news/architect-tadao-ando>. [Accessed: 26-Feb-2025].

analysis description

site analysis

architectural and social Identity

question:
What are architectural and social characteristics of this neighbourhood?

method:
mapping, on-site visit, photography, literature review

description:
Analysing the community composition and social networks. Spending a significant amount of time on site deepens observations. More personal design to the community can result with them more wanting this vision to happen.

environmental and climate context

question:
What are the main environmental problems in this neighbourhood?

method:
mapping, literature review

description:
In times of climate change, it is important to address main environmental issues in the area of the design. Especially as in dense urban environment, the need for climate action is huge.

foundation and the underground

question:
What are foundation issues and how to work with them?

method:
mapping, literature review

description:
This segment evaluates conditions of Bloemhof's soil to assess vulnerability to subsidence and flooding. By investigating advanced foundation techniques, such as deep piling, the aim is to understand possible stabilisation solutions.

theory analysis

sustainable urban design

question:
What are existing urban strategies for this area and relevant urban theories?

method:
case study, literature review

description:
It is important to situate this project in context of Rotterdam's sustainability agenda and climate crisis reality. This part explores urban elements and management strategies to mitigate environmental impact while enhancing community resilience.

nature-culture dynamics in anthropocene

question:
What are relevant theories and philosophies, and how to use them in the design process?

method:
literature review, case study

description:
The nature-culture relationship, within the Anthropocene, provides a framework to address human interventions. This helps contextualise the project's impact and Bloemhof's redevelopment within the human-driven environmental change.

social resilience

question:
What are theories about social resilience that could inform the future planning process?

method:
literature review

description:
This review examines theories on social capital, resilience, and the psychological effects of displacement. Insights from community psychology will provide a foundation for understanding how social bonds influence resilience and identity in Bloemhof.

analysis description

case studies

community engagement

question:
How engaging citizens into design process can foster better community growth?

method:
case studies, literature review

description:
Analysing how engaging residents in decision-making processes can be done and how can it influence the design and the community's unity. How making community members integral to redevelopment planning can result in better neighbourhood resilience.

construction materials and re-use methods

question:
What are the benefits and possibilities of using recycled on site materials?

method:
case studies, literature review

description:
Research into construction materials that enhance durability and water protection. This includes an assessment of materials that may be sourced locally or recycled from existing structures to support sustainable practices in building reconstruction.

approaches to displacement and rebuilding

question:
What are examples of similar cases in the Rotterdam?

method:
case studies, literature review

description:
Comparison of various case studies, local ones and global ones, on displacement, rebuilding practices, crisis management and their impact on the communities can vastly inform the future design.

field analysis

stakeholders analysis and discussions

question:
What are the parties, actors, and stakeholders in Bloemhof?

method:
discussion meetings, on-site visit

description:
Meeting with representatives from various parties in the neighbourhood gives deeper understanding of their principles and reasons of their action. Understanding their perspective better can help to develop suitable solutions.

ownership patterns

question:
What are ownership patterns and its issues?

method:
mapping, literature review

description:
An in-depth analysis of property ownership will help understand housing distribution, proportion, and dynamics in Bloemhof. This will also consider changes needed in ownership policies to promote accessibility and stability in the community.

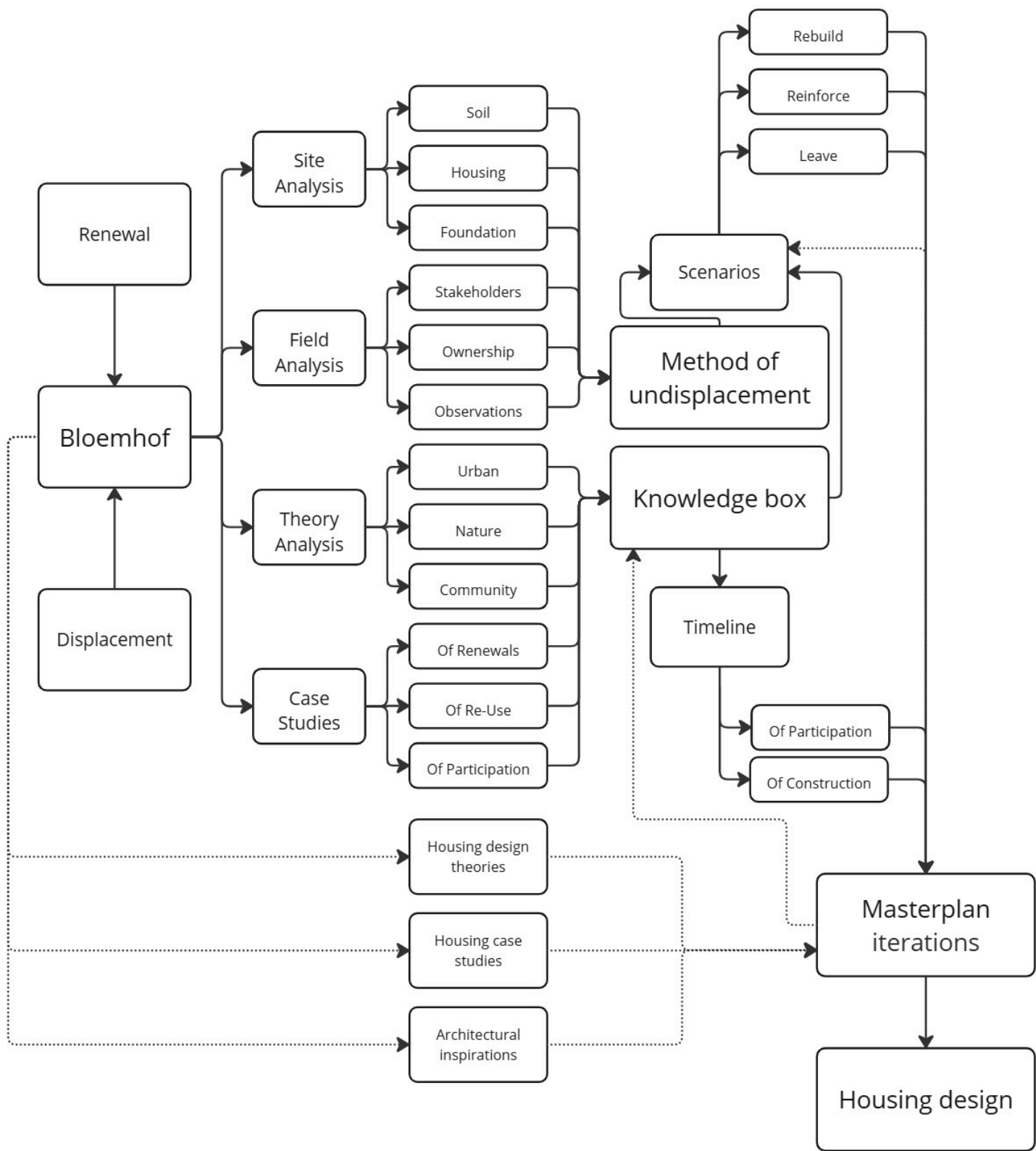
community priorities

question:
What are the needs of the community?

method:
on-site visit, discussion meetings, literature review

description:
Identifying key community importances such as housing, infrastructure, and services will guide future development and ensure alignment with local priorities.

research diagram



post-research

research diagram description

This diagram structures the paper’s analysis. It begins by diagnosing the neighbourhood’s challenges—soil sinking, unstable foundations, and fragmented ownership—paired with fieldwork insights into residents’ needs for safety, affordability, and cultural continuity.

These findings intersect with urban theories advocating participatory design and ecological resilience, framing subsidence as both a technical and social issue.

Case studies, such as flood-resilient housing or community-led upgrades, mean to translate global lessons into local strategies. The diagram then branches into adaptable design scenarios: rebuilding on stable pile foundations, retrofitting existing structures, or reusing materials from demolished buildings. A phased timeline organises these steps to minimise displacement, prioritising phased housing and gradual reconstruction.

Feedback loops ensure community input reshapes each phase, while a “knowledge box” archives technical data and governance models for future use. I is shown by dotted lines connections.

By binding soil stabilisation techniques to social equity—like cooperative housing and transparent planning—the research means to speculate on transforming renewal into a tool for cohesion, ensuring Bloemhof’s physical revival strengthens, rather than fractures, its community.

towards the design

design principles

question:
How to answer the needs of the community and other stakeholders?

method:
analysis output

description:
Extracting community and stakeholders importances will help craft a design that reflects shared goals and addresses both practical and social needs.

architectural scenarios

question:
How to design architectural scenarios for this neighbourhood?

method:
analysis output

description:
Exploring architectural models and infrastructure solutions will inform design scenarios that blend sustainability and functionality in Bloemhof’s context.

renewal timeline

question:
How should the timeline of the renewal of this neighbourhood look like?

method:
analysis output

description:
Creating a realistic timeline for urban renewal, considering planning stages, community input, and funding, will ensure efficient project execution.

chapter - 2

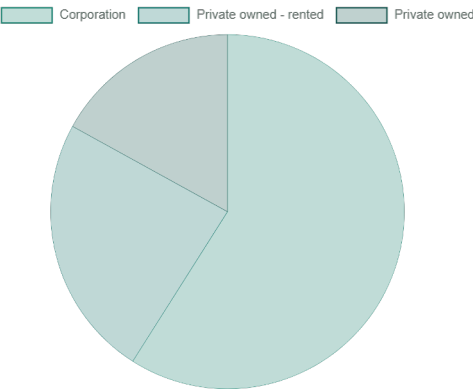
site analysis



housing

“We can’t forget that housing is a human right. Houses are not just for sale. Houses are for people, and we have to think of them first.”

[14]



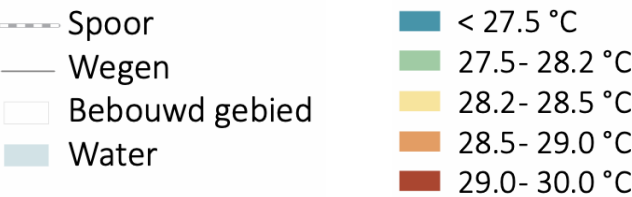
general data

There are 6,900 addresses and 6,309 homes in the Bloemhof neighbourhood in the municipality of Rotterdam, of an average of 2.0 people. Approximately 93% are inhabited and 7% are uninhabited. Most homes are rental properties. [15] This amounts to 83% rental properties and 17% owner-occupied homes. Of the homes, 17% are privately owned, 59% are owned by housing associations and 24% by other landlords. The most common construction periods in Bloemhof are 1900-1925 (50%) and 1925-1950 (26%). [5]



urban heat island effect

Bloemhof experiences the urban heat island effect, where the concentration of concrete surfaces and limited green spaces lead to higher ambient temperatures. This phenomenon results in discomfort during heatwaves, increased energy consumption for cooling, and exacerbates health issues among vulnerable populations. The neighbourhood’s dense infrastructure, characterised by extensive pavement and buildings, contributes to heat retention. Mitigation strategies involve introducing more green roofs, urban greenery, and reflective building materials to reduce heat absorption. Community-driven initiatives also promote the transformation of unused concrete areas into parks and community gardens, enhancing both aesthetics and environmental quality. [16]



references:

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- [15] “Bloemhof, Rotterdam – ‘A collaborative bu...’” [Online]. Available: <https://buurtje.nl/buurt/bloemhof-rotterdam/>. [Accessed: 24-Feb-2025].
- [5] “Buurt Bloemhof (gemeente Rotterdam) in cijfers en grafieken.” [Online]. Available: <https://allecijfers.nl/buurt/bloemhof-rotterdam/>. [Accessed: 24-Feb-2025].
- [16] “Hitte.” [Online]. Available: <https://rotterdamsweerwoord.nl/opgave/hitte/>. [Accessed: 25-Feb-2025].



architectural identity

“How different people choose to build connections in their environment essentially defines those societies and their relationships to conditions around them.” [17]



The Bloemhof neighbourhood is characterised by its working-class houses, making an impression of a village like town. These residences were intended as temporary solutions to address housing shortages. The architectural landscape features five distinct types:

- **houses with metal cladding:**

These structures showcase metal-clad facades, reflecting industrial influences and offering durability. In those, it is difficult to see on the outside the effects of subsidence.

- **traditional sloped roof houses:**

These homes feature classic pitched roofs, aligning with conventional Dutch architectural styles. On those, cracks are visible.

- **white front sloped roof houses:**

These residences are very similar to the traditional ones but use white covering in the upper floor. On this covering, the cracks are very visible, and it is easy to see where the cracks were filled.

- **white modernist buildings:**

Embracing modernist principles, these structures are characterised by clean lines and white facades, emphasising functionality and simplicity.

- **kiefhoek housing estate:**

The Kiefhoek estate comprises approximately 300 dwellings, two shops, and a church. He horizontally articulated facades combine bands of yellow brick with grey-framed glass, and front gardens are separated by yellow brick walls with blue steel railings.



The neighbourhood's infrastructure includes minimal pavement, contributing to a modest and utilitarian streetscape. Greenery is sparse, with small gardens situated at both the front and back of the houses, providing limited private outdoor spaces for residents.

references:

- [17] K. Kuma and T. Daniell, Small architecture: Natural architecture. London: Architectural Association, 2015.



water

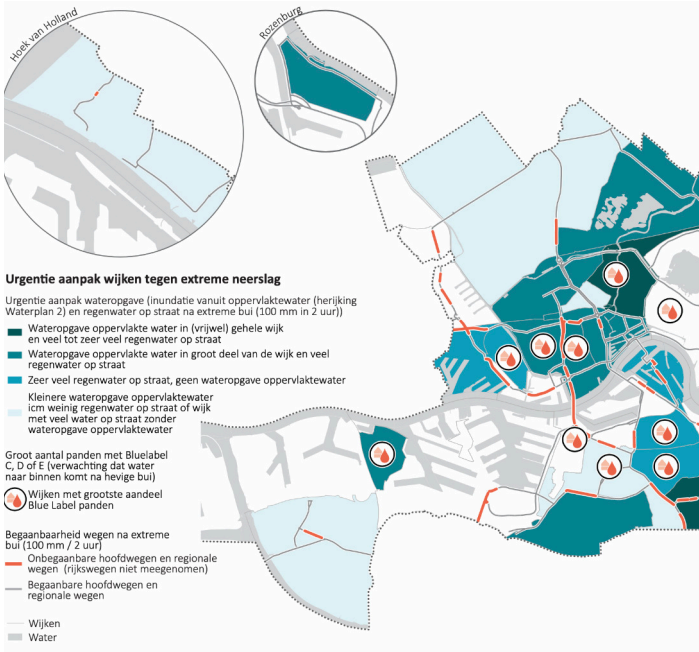
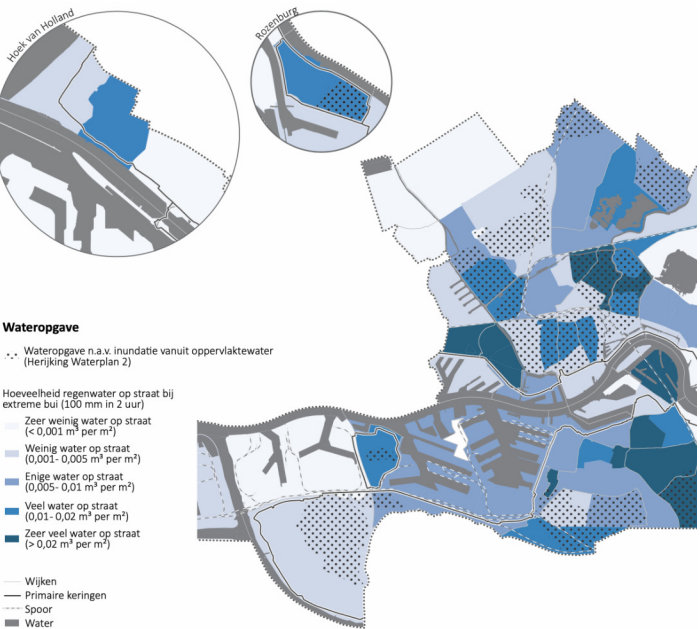
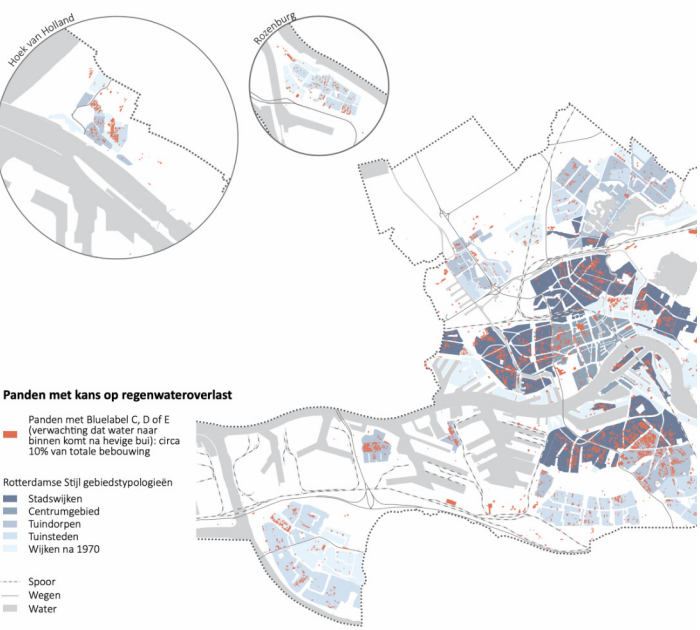
“Nature works on the principle of ‘waste equals food.’ In the natural water cycle, there’s no such thing as waste.” [18]

water clogging

Groundwater problems can arise from a slow, years-long process of land subsidence, or because buildings or greenery have not been adapted in time to the fallen soil. As a result, the depth of dewatering may become too small for the type of function located at that site. Older neighbourhoods, as Bloemhof, are certainly vulnerable, which are built with less strict building regulations than now. [19]

precipitation

With extreme precipitation (100 mm in 2 hours), the risk of flooding on the street is greatest in the dark-coloured areas. This applies to the city districts in Rotterdam South, Bloemhof including. There is potential in almost all of South Rotterdam to develop sponge-city solutions. [20]



references:

- [18] J. M. Benyus, Biomimicry: Innovation inspired by nature, Nachdr. New York, NY: Perennial, 2009.
- [19] “Grondwater.” [Online]. Available: <https://rotterdamsweerwoord.nl/opgave/grondwater/>. [Accessed: 25-Feb-2025].
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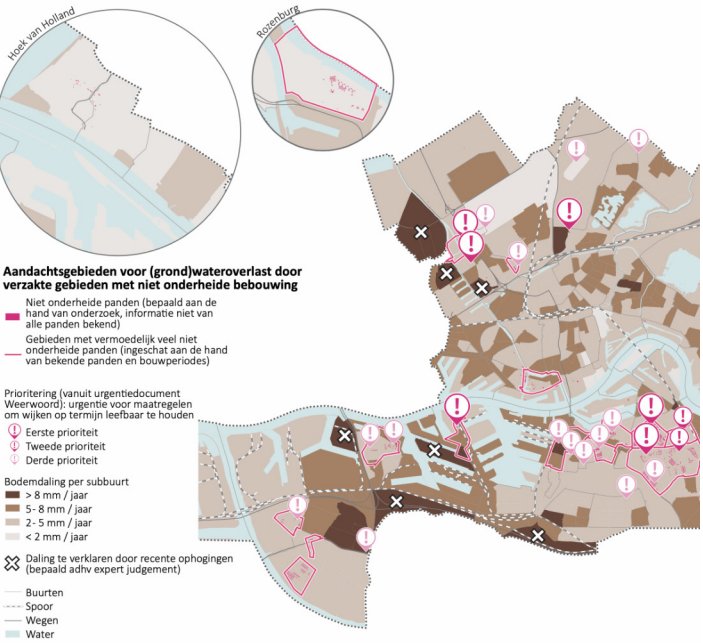
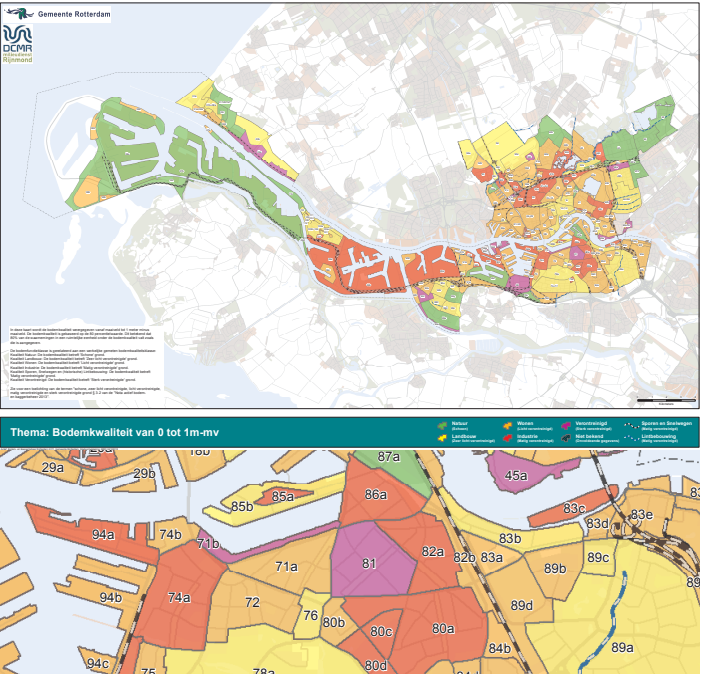
soil and subsidence

”Territory is the first assemblage,
the first thing to constitute an assemblage.” [21]

subsidence

Soil subsidence refers to the gradual sinking of the ground, typically by a few millimetres per year, though in some areas of the Netherlands, it can reach up to an inch annually. In Bloemhof, the ground is sinking at a rate of 1 to 4 millimetres per year. While this is not an immediate threat to residents, it can lead to serious structural issues over time if left unaddressed. Common problems caused by subsidence include:

- Uneven floors
- Poorly closing windows and doors
- Water accumulation in basements
- Mould and moisture issues
- Cracks in exterior walls



soil quality and lead contamination

The soil in Bloemhof is of poor quality, exacerbated by contamination concerns, particularly elevated lead levels. Lead exposure poses serious health risks, especially to children, affecting cognitive development and overall well-being. The contamination stems from historical industrial activities and the use of lead-based materials in older constructions. Efforts to address this issue include soil remediation projects, public awareness campaigns about safe gardening practices, and regular monitoring of soil quality to prevent exposure. [22]

references:

- [21] G. Deleuze, F. Guattari, and G. Deleuze, A thousand plateaus: Capitalism and schizophrenia, 12. print. Minneapolis, Minn.: Univ. of Minnesota Press, 2007.
- [22] "Koersnota Bodemkwaliteit - De bodem als basis," 2021.



foundations

“Wijk met 15.000 bewoners verzakt in hoog tempo: huizen liggen nu al 80 centimeter lager” [23]

foundations

Soil subsidence is a significant issue affecting homes in the southern parts of Rotterdam, particularly in the Bloemhof district. [23] This phenomenon occurs when the ground beneath a structure gradually sinks due to various natural and human-induced factors, such as the compaction of soft soil layers, drainage of waterlogged areas, or the decomposition of organic materials within the soil. [24] The impact of subsidence on homes can be severe, especially when their foundations are inadequate to counteract the shifting ground. [10]

consequences

A particularly problematic situation arises when houses with different foundation types are built adjacent to each other. For instance, if a house with a steel foundation is next to a house with a wooden pile foundation, the differential subsidence can lead to structural issues. [24] While the house on wooden piles remains stable, the one on steel foundations sinks, causing the two structures to shift relative to one another. This movement often results in visible cracks between the buildings, compromising their structural integrity and aesthetics. [10]

The ongoing issues with soil subsidence and inadequate foundations have led to the realisation that many houses in areas like Bloemhof will eventually need to be demolished. [23] The structural instability, caused by sinking buildings, has made long-term habitation unsustainable. In response, various parties started actively exploring solutions and developing strategies to address these challenges, including potential plans for redevelopment and reconstruction of the affected neighbourhoods. [9]

references:

- [23] P. Groenendijk, “Wijk met 15.000 bewoners verzakt in hoog tempo: huizen liggen nu al 80 centimeter lager,” 10-Oct-2023. [Online]. Available: <https://www.ad.nl/rotterdam/wijk-met-15-000-bewoners-verzakt-in-hoog-tempo-huizen-liggen-nu-al-80-centimeter-lager-a9a>. [Accessed: 22-Feb-2025].
- [24] “Informatiebijeenkomsten Bloemhof Rotterdam.” [Online]. Available: <https://www.deplekkenmakers.nl/project/bloemhof-mijn-huis-en-bodemdaling/>. [Accessed: 22-Feb-2025].
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foundation types

In Bloemhof, houses are built on three primary types of foundations: wooden piles, steel foundations, and concrete foundations. [9] The choice of foundation has a direct impact on how susceptible a house is to subsidence.

wooden pile foundation

These extend deep into the ground, reaching a stable sand layer that provides a firm base. [24] Houses built on wooden pile foundations are generally resistant to subsidence because the sand layer does not compress significantly over time. [10]

concrete foundations

Found in specific areas, such as the Kiefhoek neighbourhood, these are often more stable and less prone to subsidence compared to steel foundation. [9]

steel foundations

These do not extend to the stable sand layer and instead rest in less stable soil strata. Over time, as the soil compresses or shifts, houses with steel foundations slowly sink. [23]

no foundation

Lastly, vast amount of buildings were built in haste, without any foundations at all. This is the weakest point of this neighbourhood. [23] Those building are not only the most fragile to consequences of soil subsidence. [24]



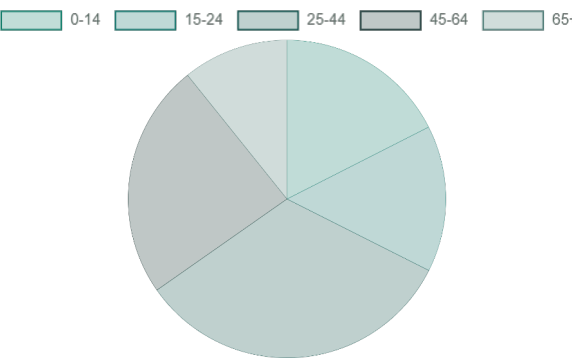
demographic

“Cities have the capability of providing something for everybody, only because, and only when, they are created by everybody.” [25]

population

Bloemhof’s population stands at approximately 13,930 residents, with a gender distribution of 49.7% male and 50.3% female. There is a modest increase in the proportion of residents aged 25–44 years in recent years, suggesting a trend toward a younger adult population. [5]

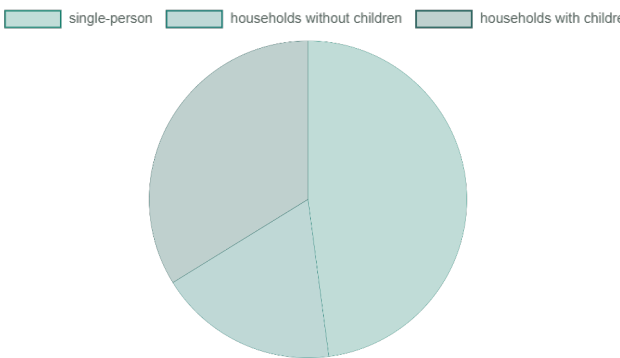
Demographic composition of Bloemhof: [5]



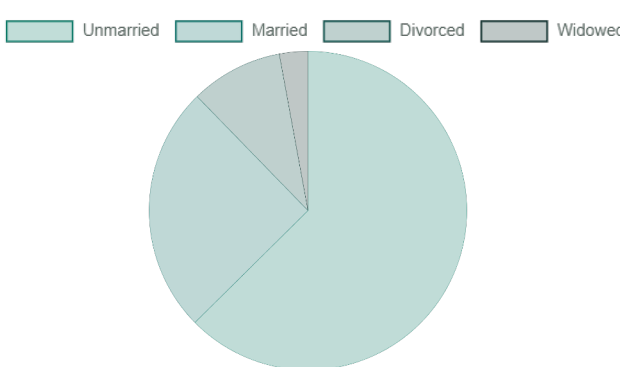
The neighbourhood exhibits distinct residential patterns. The northern part of Bloemhof experiences a high turnover rate, with many residents relocating frequently. In contrast, the southern section boasts a more stable population, with long-term residents fostering a tight-knit community. This stability in the south contributes to stronger social cohesion and a sense of belonging among inhabitants. [15]

There are 6,785 households in Bloemhof, 47.9% of which are single-person households, 18.3% households without children and 33.8% households with children. The average household size is 2.0 people. [15]

Composition of households in the Bloemhof neighbourhood: [15]



Marital status in the Bloemhof neighbourhood: [5]



references:

- [25] J. Jacobs, The death and life of great American cities, Vintage books ed. New York: Vintage Books, 1992.
- [5] “Buurt Bloemhof (gemeente Rotterdam) in cijfers en grafieken.” [Online]. Available: <https://allecijfers.nl/buurt/bloemhof-rotterdam/>. [Accessed: 24-Feb-2025].
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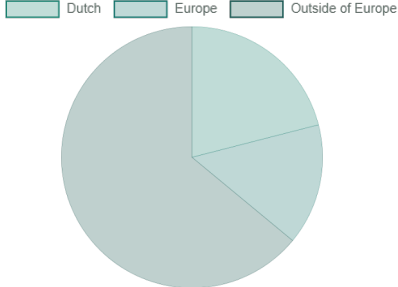
background

“Cities promote a diversity of social, cultural, and economic exchanges. The design of streets determines both the diversity and efficiency with which these exchanges can be transacted.”^[26]

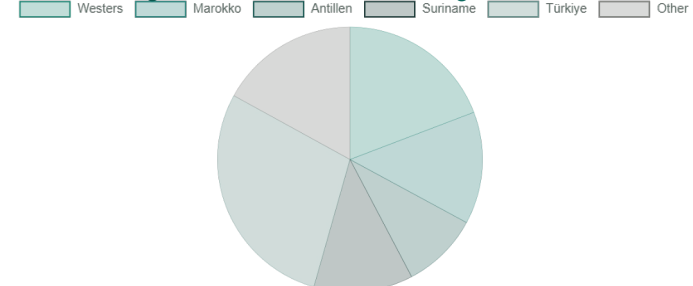
ethnic background

Almost 80% of Bloemhof inhabitants have a non-Dutch background, representing more than 150 different nationalities. This rich diversity is reflected in the variety of cultural influences present in local businesses, cuisine, and community events. The neighbourhood is home to significant communities of Turkish, Moroccan, Surinamese, and Antillean descent, among others.

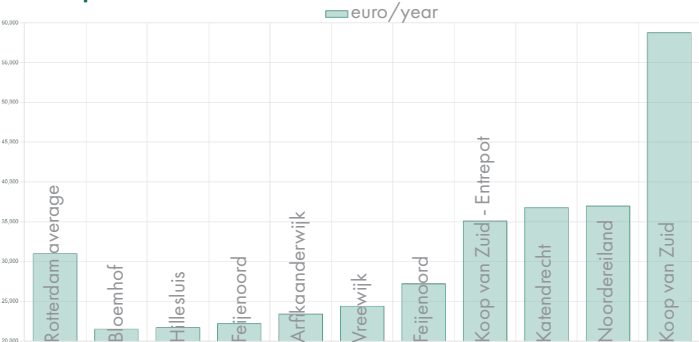
Ethnic background of Bloemhof’s residents: ^[5]



Ethnic background of Bloemhof’s migrant residents: ^[5]



Average income per year for each neighbourhood in the Feijenoord district: ^[5] ^[27]



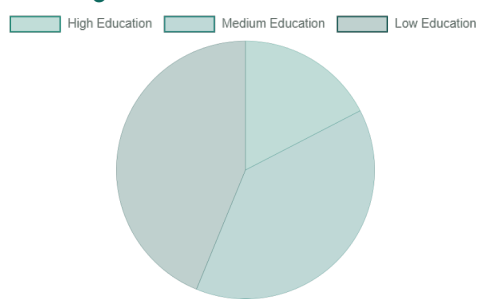
references:

- [26] D. Engwicht, Street reclaiming: Creating livable streets and vibrant communities. Philadelphia, Pa: New Society, 2000.
- [5] “Buurt Bloemhof (gemeente Rotterdam) in cijfers en grafieken.” [Online]. Available: <https://allecijfers.nl/buurt/bloemhof-rotterdam/>. [Accessed: 24-Feb-2025].
- [27] “Gemeente Rotterdam in cijfers en grafieken.” [Online]. Available: <https://allecijfers.nl/gemeente/rotterdam/>. [Accessed: 24-Feb-2025].

economic background

Economically, Bloemhof faces several challenges. The average income per resident is lower than the citywide average in Rotterdam. A significant portion of the population relies on social welfare benefits, and unemployment rates are higher compared to other parts of the city. These economic difficulties are partly attributed to lower educational attainment levels among residents, which can limit employment opportunities. Efforts are being made to address these issues through community programs focused on education, job training, and employment support to enhance economic prospects for residents.

Education background of Bloemhof’s residents: ^[5]



The average income per inhabitant of nearby Bloemhof is C21.500, which is 30% lower than the national average of C31.000. Additionally, 20% of households in the Bloemhof area have an income at or around the social minimum. Student households and households with incomplete annual income are not included.

Of the 13,930 inhabitants, about 54% are in paid employment, which is 7,522 people. This is 11% lower than the national average of 65%. The majority of employees are employed (84%), while 16% are self-employed. In Bloemhof, 24% of residents receive benefits.

safety

”Sidewalks busy with pedestrians are a crime deterrent. More people on the street—including on bikes—creates safety in numbers, a human system of indicators, signs, and signals.” [28]

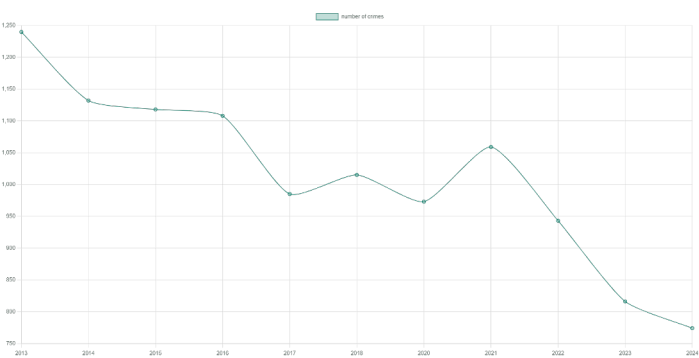


• [2] "Wijkprofiel Rotterdam." [Online]. Available: <https://wijkprofiel.rotterdam.nl/nl/2024/rotterdam>. [Accessed: 21-Feb-2025].

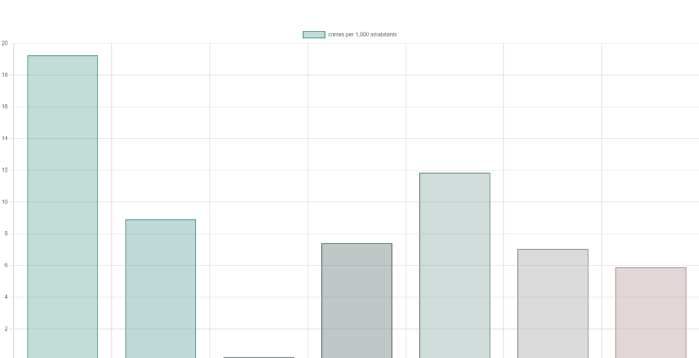
safety concerns

Safety remains a critical concern for Bloemhof residents. The Safety Index is rated at 83, suggesting that while certain areas meet acceptable standards, others require attention. The Social Index, which measures aspects like self-reliance, participation, and social cohesion stands at 69, indicating room for improvement. [2] Subjective perceptions of safety vary, with residents expressing concerns about theft, vandalism, and public disturbances. The neighbourhood has implemented community policing and neighbourhood watch programs to mitigate these issues.

Number of registered crimes in Bloemhof per year: [5]



Number and type of crimes per 1,000 inhabitants in Bloemhof in 2024: [5]



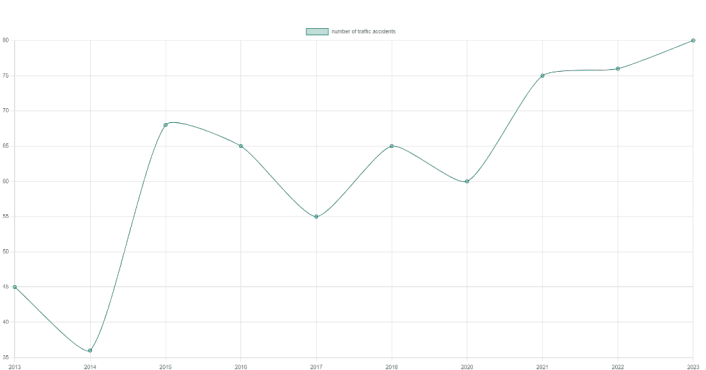
references:

- [28] J. Sadik-Khan and S. Solomonow, Streetfight: Handbook for an urban revolution. New York, New York: Penguin Books, 2017.
- [2] "Wijkprofiel Rotterdam." [Online]. Available: <https://wijkprofiel.rotterdam.nl/nl/2024/rotterdam>. [Accessed: 21-Feb-2025].
- [5] "Buurt Bloemhof (gemeente Rotterdam) in cijfers en grafieken." [Online]. Available: <https://allecijfers.nl/buurt/bloemhof-rotterdam/>. [Accessed: 24-Feb-2025].
- [29] P. Groenendijk, "In deze Rotterdamse wijken mogen geen nieuwe slijterijen meer komen: teveel overlast door alcohol," 12-Apr-2023. [Online]. Available: <https://www.ad.nl/rotterdam/in-deze-rotterdamse-wijken-mogen-geen-nieuwe-slijterijen-meer-komen-teveel-overlast-door-a>. [Accessed: 28-Feb-2025].
- [30] Rotterdam, "Aanwijzingsbesluit alcoholoverlastgebieden Bloemhof en Oud-Mathenesse," 24-Jul-2023. [Online]. Available: <https://zoek.officielebekendmakingen.nl/gmb-2023-322833.html>. [Accessed: 24-Feb-2025].

traffic

One of the significant aspect of this neighbourhood is the dependence of its residents on cars. As the communication and infrastructure around is not the best class, most of the residents commute with cars. Another factor that might play a role in that is the distance they have to travel to their work, which might be longer than for other neighbourhoods.

Number of traffic accidents in Bloemhof per year: [5]

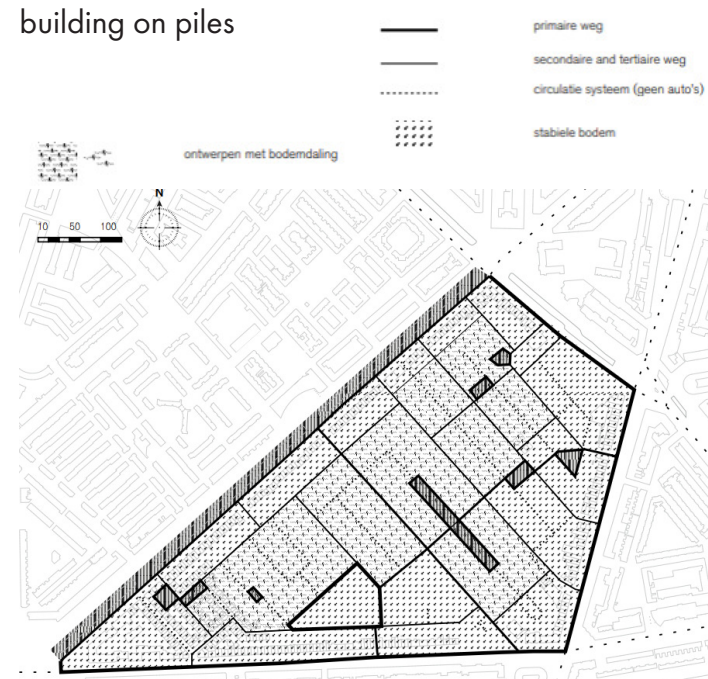
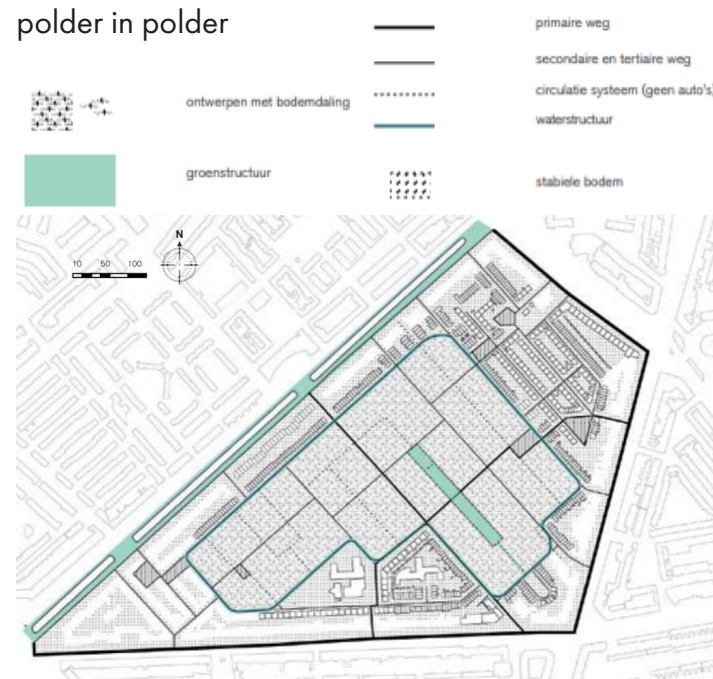


alcohol consumption

Bloemhof has a high concentration of alcohol sales points, with six liquor stores serving 14,000 residents—far above the citywide average. This contributes to frequent alcohol related disturbances. [29] Despite an alcohol ban, violations are common, and police recorded 166 incidents of public intoxication and drug use from November 2021 to 2022. Alcohol consumption also affects public spaces, with intoxicated individuals and discarded bottles creating an unsafe and unkempt environment for residents. [30]

chapter - 3

theory analysis



urban scenarios

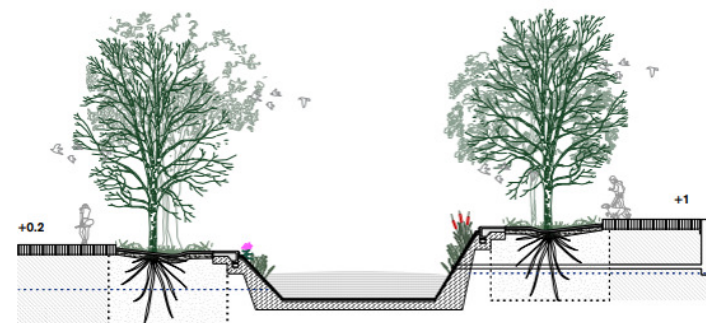
“The physical design of cities and their economic functions are secondary to their relationship to the natural environment and to the spiritual values of human community.” [31]

two scenarios

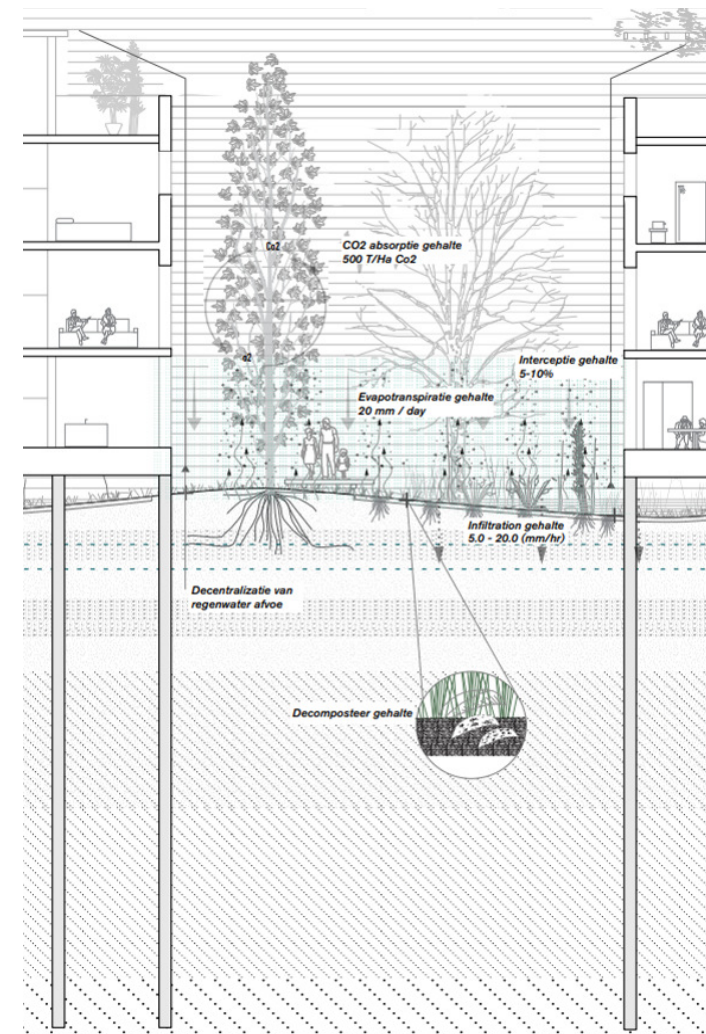
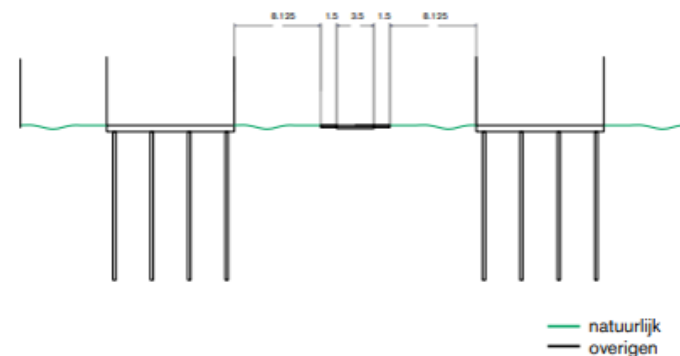
There already exist a study on this neighbourhood that addresses the issue of sinking buildings from both technical and urban perspectives. [32] Building on its insights, I aim to expand and refine some of its ideas. Two contrasting scenarios are proposed, both of which accept subsidence as a reality but respond to it in fundamentally different ways.

The first scenario, referred to as “polder within a polder,” tackles the water issue through micromanagement. This approach has significant spatial implications, as it requires dedicated space for water management systems. In this scenario, the groundwater level can drop in the central area, allowing buildings there to remain supported by steel foundations. [32]

Polder in polder constructie van de doorsnede



Woningen in het midden van voor- en achtertuin.

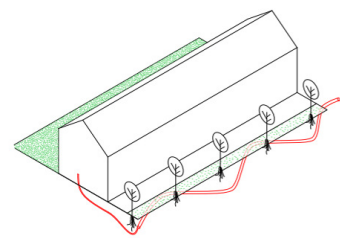


the choice

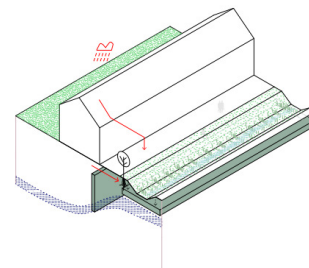
Given my focus on phased renewal and community concerns, I am more inclined toward the “on piles” scenario, as it allows for gradual implementation. Under this approach, all new construction would be built on piles at the dike’s level, where existing structures are already stabilised. While the public spaces would continue to subside, this could be leveraged to enhance the area’s ecological framework. Designing connections between fixed and subsiding zones emerges as a key task.

Unlike the authors of the referenced paper, I am not convinced of the need to preserve the neighbourhood’s village-like character. [32] Factors such as poor spatial planning, a lack of green spaces, and the urgent housing crisis call for densification in such areas. [33] These considerations outweigh the value of retaining its current form.

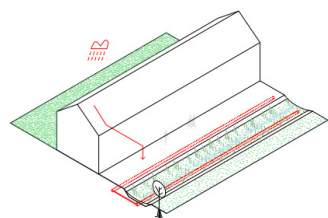
Flexibele rioolbuizen



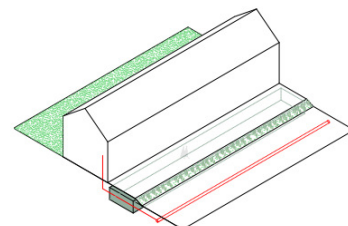
Soseal



Smart Piping



Smart Soil (BioGrout)



references:

- [31] R. T. LeGates and F. Stout, The city reader, Seventh edition. Abingdon, Oxon New York, NY: Routledge, 2020.
- [32] F. Hooimeijer, F. Lafleur, E. Yap, J. Dobbeltstein, and T.-T. Trinh, “Intelligent SubSurface Quality 003 Bloemhof-Zuid,” 2018.
- [33] “Rotterdam tenants fight demolition of 20,000 low-cost apartments | NLTimes,” 03-Mar-2016. [Online]. Available: <https://nltimes.nl/2016/03/03/rotterdam-tenants-fight-demolition-20000-low-cost-apartments>. [Accessed: 23-Feb-2025].



urban theories review

“I like ruins because what remains is not the total design, but the clarity of thought, the naked structure, the spirit of the thing.” [34]

Henri Lefebvre

idea:

Lefebvre advocates for equitable access to urban spaces and the right of residents to participate in decisions shaping their environments. [35]

relevance:

Prioritises the inclusion of marginalised groups in redevelopment discussions. Encourages public spaces and housing that reflect the community’s diverse needs and aspirations.

example:

The redevelopment of Medellín, Colombia, incorporated community participation to transform violent neighbourhoods into vibrant urban centres.

Jane Jacobs

idea:

Jacobs championed the role of vibrant, diverse neighbourhoods in creating resilient cities, advocating for small-scale, human-centred urbanism.[25]

relevance:

Preserves and enhances the social fabric of the community by supporting mixed-use development and active public spaces. Prioritises bottom-up approaches where local knowledge shapes redevelopment.

example:

Jacobs’ principles inspired the revitalisation of New York City neighbourhoods, balancing development with community needs.

Toni Griffin

idea:

Toni Griffin emphasises the concept of the “Just City,” advocating for planning that prioritises equity, inclusion, and social justice. She argues that cities should be designed to address systemic inequalities. [36]

relevance:

Design urban spaces that actively combat inequality and promote social justice. Prioritise inclusive planning processes that ensure equitable access to housing, transportation, and public amenities.

example:

The Detroit Works Project, led by Toni Griffin, focused on revitalising Detroit through equitable urban planning, including community engagement strategies that empowered residents to shape their neighbourhoods.

Jan Gehl

idea:

Jan Gehl champions the design of cities for people, not cars. He emphasises the importance of human-scale urban design, prioritising walkability, public spaces, and the quality of life for residents. [37]

relevance:

Design cities and public spaces that prioritise pedestrian-friendly environments, encourage social interaction, and improve the quality of urban life. Reduce car dependency and create vibrant, accessible public spaces that invite people to linger and connect.

example:

Copenhagen’s transformation into a pedestrian and cyclist-friendly city, guided by Gehl’s principles, has become a global model for people centric urban design.

references:

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- [37] J. Gehl, “Home.” [Online]. Available: <https://www.gehlpeople.com/>. [Accessed: 02-Mar-2025].



nature theories review

“Nature and culture are reworked; the one can no longer be the resource for appropriation or incorporation by the other.” [38]

| Donna Haraway | Rosi Braidotti |
|---|---|
| <p>idea:</p> <p>Haraway emphasises the need to embrace complexity and advocates for multispecies justice, collaboration, a rejection of anthropocentric thinking. [39]</p> <p>relevance:</p> <p>Haraway’s call to include non-human actors can inspire integrating green solutions that support more-than-human life. Haraway encourages collaborative problem-solving that includes diverse human and non-human stakeholders. Subsidence could be used as an opportunity to rethink urban relationships with land, water, and the environment.</p> <p>example:</p> <p>The project in Bogotá, Colombia, which reintroduced wetlands as part of urban water management.</p> | <p>idea:</p> <p>Braidotti’s posthuman philosophy challenges the idea of human exceptionalism and advocates for an ethics that considers humans as part of a larger web. [40]</p> <p>relevance:</p> <p>Braidotti’s vision supports ecological solutions such as reusing building materials (e.g., bricks, windows) and implementing energy-efficient housing designs to minimise environmental impact. Braidotti advocates for profound shifts in how cities are designed and governed, encouraging a move away from extractive practices toward regenerative models.</p> <p>example:</p> <p>The urban regeneration project in Malmö, Sweden, green roofs and renewable energy systems were implemented in redeveloped areas.</p> |
| Arne Naess | Bruno Latour |
| <p>idea:</p> <p>Deep Ecology promotes a shift from the anthropocentric (human-centred) to the ecocentric (naturecentred) thinking, emphasising the interdependence of humans and nature. [41]</p> <p>relevance:</p> <p>Advocates for integrating green infrastructure, such as wetlands and Miyawaki forests, into the urban fabric. Encourages sustainable urban systems that harmonise with ecological processes.</p> <p>example:</p> <p>The Hammarby Sjöstad eco-district in Stockholm demonstrates an integrated approach to sustainability.</p> | <p>idea:</p> <p>Actor-network theory posits that humans and non-humans are entangled in networks of influence and agency. [42] He argues for more inclusive governance that incorporates ecological concerns. [43]</p> <p>relevance:</p> <p>In Latour’s framework, urban planning must address the agency of the other than human ‘objects’. His work encourages recognising the interconnectedness in urban systems. This perspective could promote integrated infrastructure, where its systems, greenery, and housing function cohesively.</p> <p>example:</p> <p>The “Room for the River” program in the Netherlands, which redesigns urban and rural landscapes to give rivers more space.</p> |

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community theories review

“Urban regeneration is at the end of the day always about people, including the most marginalised” [44]

definition

Social resilience refers to the capacity of individuals, communities, and systems within a city to anticipate, adapt, and recover from stresses or shocks, such as environmental challenges, economic crises, or social disruptions. [45]

key components of social resilience

social capital

definition:

The networks of relationships, trust, and cooperation among individuals and groups within a community.

relevance:

Strong social capital helps communities mobilise resources, share information, and collectively solve problems.

example:

In New Orleans, post-Hurricane Katrina, neighbourhoods with high levels of social capital were better equipped to organise recovery efforts. [46]

community participation

definition:

Opportunities for residents to actively participate in decision-making processes that affect their lives and neighbourhoods.

relevance:

Empowered communities are more likely to advocate for their needs, leading to more inclusive and equitable urban planning.

example:

Participatory budgeting initiatives in Porto Alegre, Brazil, have empowered citizens to allocate municipal funds for community-driven projects. [47]

equitable access to resources

definition:

Ensuring all residents have fair access to housing, education, healthcare, and public amenities.

relevance:

Equitable access strengthens a community's ability to adapt to and recover from challenges.

example:

Vienna's social housing program provides affordable, well-designed housing to over 60% of its population, promoting social equity and community resilience. [48]

cultural and social cohesion

definition:

A sense of belonging and shared identity among community members.

relevance:

Cohesion fosters mutual support during crises and facilitates collective action.

example:

Community cohesion initiatives in Rotterdam's Afrikaanderwijk have reduced social tensions and strengthened local identity through cultural festivals and shared spaces. [49]

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fourth nature

“Nature in cities is not only a remnant of the past but also a novel ecosystem that has emerged under the influence of urban conditions.” [50]

context

The redevelopment of Bloemhof, reflects broader discussions within the Anthropocene — a period of profound human influence on Earth, characterised by industrialisation, agriculture, and fossil fuel use, leading to the destruction of ecosystems and a dramatic reduction in untouched land—only 3% of Earth’s surface remains free from human interference. [52] In response to these changes, there is a growing push for non-anthropocentric design approaches that foster sustainable relationships between humans and other species. This shift is reflected in the idea of “Fourth Nature,” where urban wastelands and abandoned spaces, overtaken by plants and wildlife, demonstrate the potential for biodiversity in areas often seen as neglected or degraded. [53] [54] In this context, Bloemhof’s renewal is not just about stabilising its sinking foundations, but also about rethinking urban space in a way that fosters long-term sustainability.

theory

Philosophers like Martin Heidegger have long emphasised the need for a responsible relationship with nature. [55] Contemporary thinkers such as Bruno Latour and Timothy Morton advocate for recognising nature’s agency and interconnectedness [56] [57], while Donna Haraway’s concept of “natureculture” emphasizes the inseparable link between culture and the natural world. [58] This philosophy challenges traditional views of nature and encourages a more integrated approach to human-environment interactions. There is a great example of such intertwined relations in the city of Wrocław in Poland. The history of two hills in that city also strongly resonates with the concept of Fourth Nature, introduced by Ingo Kowarik, which highlights how spontaneous vegetation in urban wastelands can contribute to biodiversity. [53] Gilles Clement’s “Third Landscape” similarly celebrates the value of neglected, wild spaces in fostering ecological resilience. [51] These concepts urge us to reconsider human intervention, suggesting that abandoned spaces can become crucial areas for ecological recovery.

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in the anthropocene

”The Third Landscape is the space left over by man to landscape evolution—to nature alone.” [51]

history

Wrocław, Poland, offers a compelling example of how history, nature, and urban development intersect. Two of its southern hills—Wzgórze Gajowe and Wzgórze Andersa—were shaped by the devastation of World War II. [59] Once a wasteland and war ruins, these hills gradually transformed as nature began to reclaim the space. Over time, both sites became symbols of urban resilience, showing how nature can regenerate even in the most challenging environments. Wzgórze Gajowe shows an interesting process where a post-industrial area, with a rich history, becomes wasteland and then from this waste the hill is build. [60] Later it becomes an important point on the ecological map of the city and lively place for city’s citizens. [61] [62]

Wzgórze Andersa’s development reflects the tension between urban commercialisation, community activism, and ecological preservation. In the 1970s the war ruins of old tenement houses were transformed to a hill and in the late 1990s, the Wrocław City Council envisioned a “southern route” to connect it with surrounding green spaces. The subsequent development of the Wrocław Water Park in 2005, while commercially successful, sparked protests due to concerns about the loss of green space. [63] Poor urban planning near the site raised further concerns over accessibility and safety, yet grassroots initiatives continue to shape the hill’s future. [64]

Over time, Wzgórze Andersa has become a space for both ecological preservation and urban activity, though its development remains somewhat fragmented. [65] [66] It is a great example of interconnectedness of nature agency but more so of a clash of top-down and bottom-up initiatives.

conclusion

The example of Wzgórze Gajowe and Wzgórze Andersa offer key lessons for new urban developments. These hills illustrate how nature can transform even the most neglected spaces, providing valuable insights for areas where old buildings must be demolished to make way for new construction. Rather than simply clearing land, urban planners can embrace the concept of Fourth Nature by leaving flexible, “unplanned” green zones. [53] These spaces allow nature to shape the environment, fostering biodiversity and enriching the urban landscape.

Additionally, the materials from demolished buildings—such as stones, bricks, and other remnants—can be repurposed for landscaping or creating “undesigned” parks and green spaces. This approach not only reduces waste but also integrates the past with the present, blending ecological and cultural continuity, which plays along the idea of sustaining Bloemhof’s community and evolving it architectural identity. It can result with a deeper connection between people, nature, and the built environment while embracing spontaneity in the development of urban spaces. [67]

It can be a guide for Bloemhof to design more adaptive redevelopment strategy. Instead of viewing the ground’s instability solely as a technical challenge, integrating nature’s agency into the renewal process can turn the issue into an opportunity. Green corridors, spontaneous vegetation, and repurposed materials from demolished structures—such as stones, bricks, and wood—could help create new landscapes that support both ecological and social resilience.

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chapter - 4

case studies

personal case

“A good city is like a good party — people stay longer than really necessary, because they are enjoying themselves.” [68]

civic studio
My experience in the Civic Studio - Plac Grunwaldzki Renewed project was transformative, offering a deep dive into community-driven urban development. The project, which spanned two years, aimed to increase community participation in shaping the future of the Plac Grunwaldzki neighbourhood in Wrocław. [69]

Our goal was to empower local leaders active in ecology and sustainable development to shape the area’s functionality through collaboration with the wider community. This project highlighted the power of humble, community-centred approaches to urban transformation, where local leaders, with the support of community centres, can lead positive change. [70]



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finding community leaders
The process involved creating a group of specialists and community leaders who worked together to research the neighbourhood’s spatial needs. We conducted workshops, meetings, and walkarounds to better understand residents’ concerns and desires. It became clear that the local community knows its needs best, but we learned that it’s crucial not to ask directly what they need. Instead, we needed to ask what they do in their everyday lives and what annoys them. This subtle shift in approach led to valuable insights that guided our work.

building bonds
Building bonds among community members was vital for the success of the project. We connected them through a series of festivals and events, offering opportunities to come together and share their perspectives. To engage a broader audience, we promoted our efforts in local hubs like churches, schools, and culture centres, ensuring that we reached diverse segments of the community.

language and design
One of the most important lessons learned was the need to find the community’s language. By using the language of benefits—focusing on how improvements would positively impact their daily lives—we were able to create a sense of ownership and involvement in the process. The culmination of our work was the development of a design and campaign for the city’s participatory budget, which will continue to benefit the neighbourhood.

participation cases

Hammarby Sjöstad
background:
Hammarby Sjöstad, once a polluted industrial area in Stockholm, was redeveloped into a sustainable urban district starting in the 1990s. [71]
transparent consultation:
The project emphasised early and continuous engagement with residents through public forums and workshops, allowing for input on design and sustainability goals. [71]
citizen panels:
Regular citizen panels were established to facilitate feedback, ensuring that residents’ concerns were addressed throughout the planning process. [72]
interactive planning:
Planners utilised interactive models and visual aids during consultations to help residents understand proposed changes and contribute meaningfully. [71]
inclusive housing policies:
The development included a mix of housing types—rental apartments, cooperative housing, and privately owned homes—to ensure affordability and accessibility for various income levels. [73]
relocation assistance:
Residents affected by the redevelopment were offered financial compensation, priority access to new housing within the area - minimising displacement. [72]
commitment to equity:
By balancing market-driven development with public housing initiatives, the project minimised socio-economic displacement, enabling low- to middle-income families to remain in or return to the area. [73]

| Aspect | Hammarby Sjöstad | Favela-Bairro |
|---------------------------|---|---|
| Planning Approach | Top-down but participatory workshops and citizen panels | Bottom-up, emphasizing local leadership and input |
| Housing Diversity | Mixed-income housing with public housing inclusion | In-situ improvements with no forced evictions |
| Focus Areas | Sustainability, eco-friendly design | Basic infrastructure, legal land ownership |
| Dealing with Displacement | Relocation assistance and inclusive housing policies | Upgrading without relocation or gentrification |

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Favela-Bairro Program
background:
Initiated in 1994, the Favela-Bairro program aimed to integrate informal settlements (favelas) into the formal city structure by improving infrastructure and services without displacing residents. [74]
participatory planning workshops:
Workshops allowed residents to discuss redevelopment goals, propose solutions, and review plans alongside architects and urban planners. [75]
local employment:
The program prioritised hiring residents for construction and infrastructure work, creating jobs and fostering a sense of ownership in the process. [74]
cultural projects:
Planners incorporated community spaces, playgrounds, and art projects designed by residents, emphasising the social and cultural identity of each neighbourhood. [76]
in-situ improvements:
A core principle of Favela-Bairro was upgrading settlements without relocating residents. Planners improved existing homes, roads, and infrastructure instead of demolishing and rebuilding. [74]
land regularisation:
Efforts were made to provide residents with legal land titles, giving them ownership and stability. [76]
avoiding gentrification:
By focusing on basic infrastructure and public services rather than high-end redevelopment, the program avoided the influx of wealthier outsiders, preserving the fabric of the neighbourhoods. [75]

conclusions
Both cases highlight the importance of community involvement, thoughtful planning, and balancing development goals with equity. Hammarby Sjöstad demonstrates how sustainability and modernity can coexist with inclusion, while Favela-Bairro exemplifies grassroots-driven urban improvement.



participation toolbox

“Public Space is for living, doing business, kissing and playing. Its value can’t be measured with economics or mathematics; it must be felt with the soul.” [77]

organising the community

identify stakeholders

- Map the Community: Identify residents, local leaders, businesses, schools, cultural institutions, and NGOs.
- Ensure Representation: Include marginalised groups such as low-income families, minorities, and non-homeowners who are often overlooked.

build relationships

- Engage Early: Reach out before plans are finalised to build trust.
- Leverage Local Leaders: Partner with respected community figures who can act as liaisons and advocates.

establish structures for participation

- Create Committees: Form representative groups to facilitate dialogue between the community and planners.
- Appoint Coordinators: Designate point persons for communication and logistics.

building community capacity

education and awareness

- Provide Transparent Information: Use accessible language and visuals to explain project goals, timelines, and impacts.
- Host Workshops: Educate residents on urban planning processes, their rights, and how they can influence decisions.

skills training

- Empower Local Leaders: Train community members in negotiation, advocacy, and public speaking.
- Facilitate Peer Learning: Encourage knowledge-sharing among residents who have experience with similar initiatives.

design the participation process

use diverse engagement methods

- Public Meetings: Organise town halls for open dialogue. Offer childcare and accessible locations to ensure participation.
- Small Focus Groups: Facilitate intimate discussions with targeted groups to capture specific concerns.
- Surveys and Polls: Distribute digital and paper surveys for broad input.
- Participatory Design Workshops: Involve residents in co-creating plans with planners and architects.

ensure inclusivity

- Culturally Sensitive Communication: Provide multilingual materials and interpreters.
- Flexible Scheduling: Hold events at varied times to accommodate diverse schedules.
- Technology Access: Use online tools but provide alternatives for those without internet access.

provide feedback loops

- Update Regularly: Share progress updates through newsletters, social media, and public forums.
- Show Impact: Highlight how community input has shaped decisions.

sustaining engagement

build trust and transparency

- Set Clear Expectations: Outline what aspects of the project are open to influence.
- Acknowledge Challenges: Be honest about constraints and trade-offs.

foster long-term relationships

- Community Partnerships: Collaborate with local organisations for continued engagement.
- Celebrate Successes: Host events to mark milestones and achievements, reinforcing the community’s role in the project.

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material re-use

“Reuse and recycling are more than practical solutions. By reusing materials, we connect the past with the future, creating buildings that are not only more sustainable but also tell compelling stories.” [81]

potential and examples

The structural challenges in areas like Bloemhof have necessitated the demolition of numerous houses. However, this process presents an opportunity to salvage and re-purpose building materials, aligning with sustainable construction practices. Elements such as bricks, windows, and window frames can be carefully extracted and reused in new constructions, reducing waste and conserving resources. [82]

A notable example of this approach is the Waste House project in Brighton, UK. Constructed using approximately 85% waste materials, including reclaimed bricks and windows, the building demonstrates the potential of re-purposed materials in creating functional and sustainable architecture. [83]

In the Netherlands, initiatives like New Horizon Urban Mining, founded by Michel Baars, focus on deconstructing buildings to harvest materials for reuse in new construction projects. This method not only reduces waste but also lowers the carbon footprint of new buildings by minimising the need for virgin materials. [84]

Additionally, the City of Richmond in Indiana, USA, successfully deconstructed its old hospital, achieving a 96% material recovery rate. Materials such as concrete and metal were recycled or reused, diverting significant amounts of waste from landfills and saving the city substantial disposal costs. [85]

By adopting similar practices, areas like Bloemhof can more sustainably address structural issues.

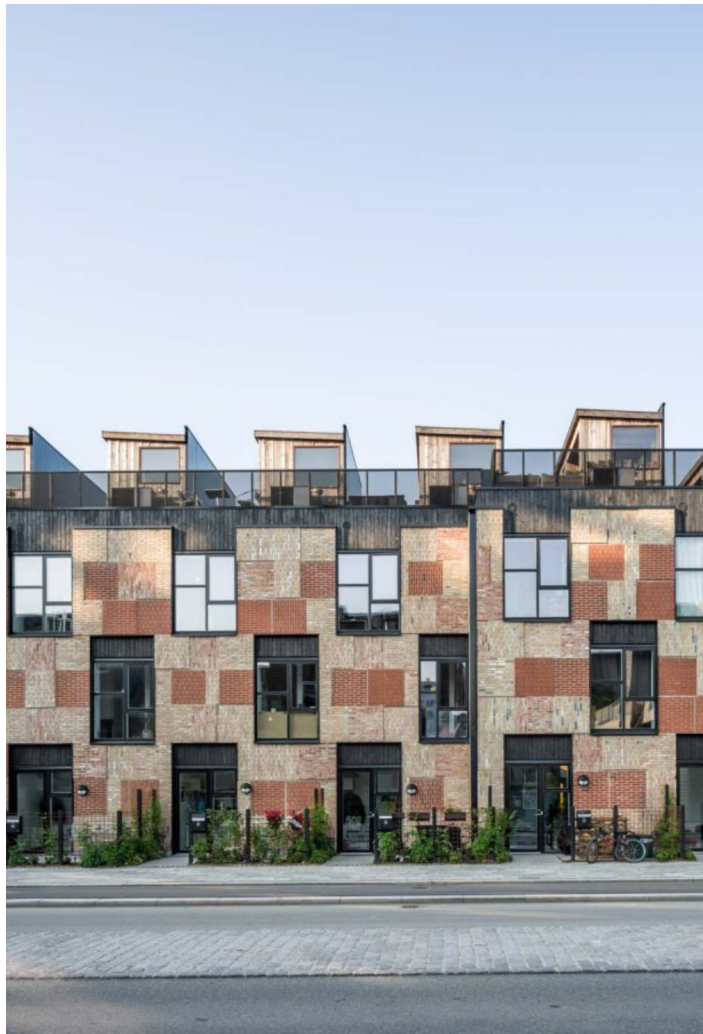


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circularity

The transition to a circular built environment demands radical shifts in material reuse, stakeholder collaboration, and systemic innovation. Drawing on pioneering case studies and interdisciplinary research, this chapter explores how experimental projects and policy frameworks are reshaping construction practices to align with sustainability goals.

resource rows

The Resource Rows housing complex in Copenhagen exemplifies circularity through upcycled materials and hybrid design. [86] Facades incorporate reclaimed concrete from demolished buildings, while timber structures reduce embodied carbon. This project highlights the technical feasibility of integrating waste streams into high-quality architecture, as emphasised in studies on circular material flows. [90] However, challenges persist: material standardisation and supply chain coordination remain barriers, as noted in the FCRBE project [94], which advocates for digital platforms to track reusable components. The social dimension is equally critical; research on tenant engagement underscores the need to involve residents in circular transitions, ensuring affordability and inclusivity—a balance Resource Rows achieves through mixed-income housing. [93]

collaboration and systemic change

Both case studies reveal that circularity thrives on collaboration. Resource Rows partnered with demolition firms to secure materials, reflecting findings on architect-contractor synergies [88]. Similarly, TESTBEDS bridges academia, industry, and policymakers, fostering knowledge exchange critical for systemic change. Co-creation with marginalised communities to avoid “circular gentrification” is emphasised in. [93] For example, integrating tenant feedback loops—as explored in [90]—can ensure equitable access to circular housing benefits.

challenges and forward pathways

Despite progress, hurdles persist. Material passports and life-cycle assessments (LCAs), as proposed in [92], require broader adoption to quantify environmental savings. Moreover, the RIVM report warns of “circular rebound” effects, where efficiency gains spur increased consumption. [89] Policy must address these risks through stricter waste regulations and tax incentives for reuse, as seen in Northwestern Europe’s FCRBE network. [94] TU Delft’s “Next Steps Towards Circular Renovation” also advocates for integrating circular principles into education [95], empowering to design for disassembly.

conclusion

The circular transition is socio-technical. Projects like Resource Rows and TESTBEDS demonstrate that innovation flourishes at the intersection of design, policy, and community engagement. As the REHAB project concludes, the goal is clear: buildings must become “material banks” for future generations, where waste is obsolete and sustainability is systemic. [88]

testbeds

The TESTBEDS initiative adopts a living-lab approach to test circular solutions in real-world settings. [87] By prototyping modular systems and reversible building techniques, the project aligns with findings from TU Delft’s REHAB project [88], which stresses adaptability in existing building stocks. For instance, design strategies like prefabrication and disassembly, enabling future material recovery, are highlighted in. [91] TESTBEDS also mirrors insights from the RIVM report [89], which calls for policy incentives to scale pilot innovations. Yet, regulatory fragmentation—such as conflicting building codes—often impedes progress, a challenge echoed in governance gap analyses. [92]

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neighbourhood stories

Rotterdam’s urban renewal efforts have modernized infrastructure, transforming historically working-class areas.

Feijenoord

background:

Another district in Rotterdam Zuid, Feijenoord is home to a diverse population with significant immigrant communities. [96]

urban renewal:

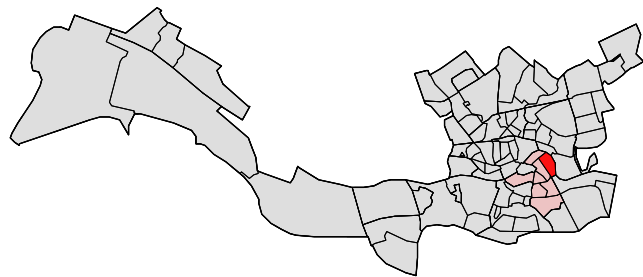
The area has seen investments in public housing upgrades, new schools, and parks under NPRZ. Emphasis has been placed on improving employment opportunities and education for residents. [97]

challenges:

Gentrification has begun to creep into parts of Feijenoord, with rising property values and increased pressure on affordable housing. The community has expressed concerns about losing its cultural identity as wealthier newcomers move in.

outcome:

While improvements in infrastructure and services are evident, the community remains wary of the long-term impacts of gentrification.



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Nieuw Crooswijk

background:

Nieuw Crooswijk, a historic working-class neighbourhood in Rotterdam, faced significant socio-economic challenges by the late 20th century, including poverty and housing degradation. [98]

urban Renewal:

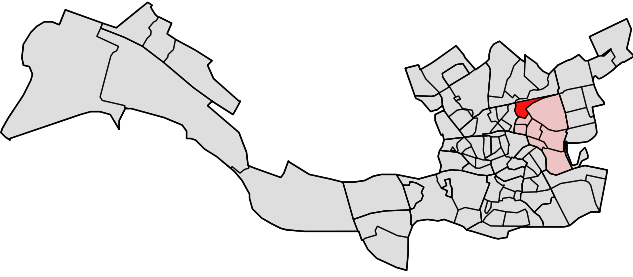
In response, a large-scale urban renewal project was initiated in the early 21st century, aiming to modernise the area with mixed-income housing and improved public spaces.

challenges:

The project led to the displacement of long-term, lower-income residents, many of whom could not afford to return due to rising housing costs. Critics highlighted the lack of community participation in decision-making. [99]

outcome:

Now it features modern housing, attracting wealthier residents. Debates continue regarding the social impact of the renewal, particularly concerning the displacement of the original community.



neighbourhood stories

These projects spark debates over gentrification, displacement of residents, and the erosion of cultural and social identity.

Katendrecht

background:

Once known as a working-class neighbourhood with a reputation for poverty and crime, Katendrecht has undergone a dramatic transformation. [100]

urban renewal:

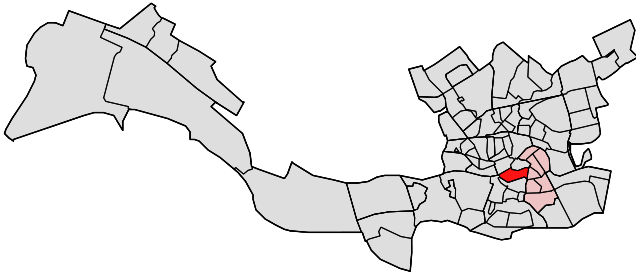
The municipality invested heavily in redeveloping Katendrecht, focusing on turning it into a vibrant area for young professionals and families .The addition of the iconic Fenix Food Factory and upscale housing projects, such as the redevelopment of the Fenix warehouses, has attracted wealthier residents. [101]

challenges:

Displacement of long-term, lower-income residents due to rising rents and property values. The loss of Katendrecht’s historical identity as a diverse, working-class neighbourhood. Resistance from community groups advocating for affordable housing and preservation of the area’s culture. [102]

outcome:

Katendrecht is now considered a successful example of urban renewal, but critics point to its gentrification as a model of exclusionary development.



references:

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Spangen

background:

Once considered one of Rotterdam’s most problematic neighbourhoods, Spangen faced issues of poverty, crime, and housing deterioration. [103]

urban renewal:

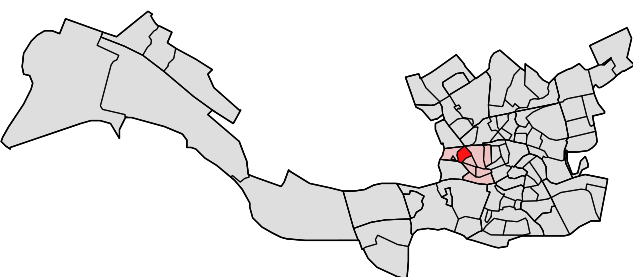
Large-scale housing renovations, such as the transformation of the Justus van Effen complex into modern apartments, have been central to Spangen’s renewal. Focus on improving public spaces, adding greenery, and fostering community initiatives. [107]

challenges:

Rising rents and property prices have made it difficult for lower-income families to remain. The renewal process has led to a socio-economic shift in the neighbourhood, with wealthier residents replacing working-class families.

outcome:

Spangen is now regarded as a revitalised and desirable area, but the socio-economic changes have sparked debates over displacement and equitable urban planning.



neighbourhood case study

The redevelopment of Tweebosbuurt in Rotterdam has encountered significant challenges and controversies.

displacement and social impact

resident evictions:

The plan to demolish social housing units led to the displacement of many long-term residents, predominantly from low-income and immigrant backgrounds. Some residents resisted eviction, resulting in legal battles. In January 2020, the Rotterdam sub-district court ruled in favour of certain residents, referencing the fundamental right to housing. [104] However, subsequent appeals and legal actions continued, with housing corporation Vestia initiating new eviction processes.

loss of community:

The strong sense of community in Tweebosbuurt was disrupted by the redevelopment plans, causing dissatisfaction and emotional distress among residents. Protests and resistance movements emerged in response to the perceived threat to the neighbourhood's social fabric. [105]

cultural and historical preservation

loss of heritage:

The demolition of older homes was seen by many as erasing the neighbourhood's cultural identity. Efforts to preserve historically significant facades were viewed as insufficient to maintain the area's heritage. [106]

resistance movements:

Local activists and residents organised protests and occupied buildings to oppose the demolition and advocate for alternative approaches that would preserve the community. [107]

references

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legal and political controversies

court rulings:

Legal disputes arose as residents challenged the municipality's decisions. While some initial rulings favoured residents, subsequent appeals often sided with the municipality, allowing the project to proceed. These legal battles highlighted the tension between urban renewal initiatives and residents' rights. [104]

gentrification concerns:

Critics labelled the project as a move toward gentrification, accusing authorities of prioritising middle- and upper-income groups over the existing low-income population. The reduction in affordable housing stock and the introduction of more expensive units intensified these concerns. [107]

environmental concerns

sustainability questions:

Although the redevelopment emphasises sustainability, critics argue that demolishing existing structures and constructing new ones may have environmental costs that outweigh the benefits. [106]

community engagement

limited consultation:

Residents felt excluded from the planning process, with decisions made by authorities and developers without sufficient input from those directly affected. This lack of engagement led to mistrust and opposition to the redevelopment plans. [107]

tweebosbuurt renewal

Issues were particularly concerning displacement, gentrification, and community disruption.



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broader urban policy criticism

Nationaal Programma Rotterdam Zuid:

While NPRZ aims to revitalise Rotterdam Zuid, critics argue that its top-down approach often excludes local communities from decision-making processes, leading to policies that may not align with residents' needs. [107]

socio-economic divide:

The project is seen as exacerbating the socio-economic divide in Rotterdam, with wealthier newcomers benefiting from urban renewal projects while long-term, lower-income residents are displaced. [107]

conclusion

The challenges in Tweebosbuurt underscore the complexities of urban renewal, where the drive for modernisation and economic growth often conflicts with the needs and rights of existing communities. The controversies highlight the importance of equitable and inclusive urban planning that prioritises the well-being of all residents.



chapter - 5

field work



stakeholders

“Rotterdam tenants fight demolition of 20,000 low-cost apartments” [33]

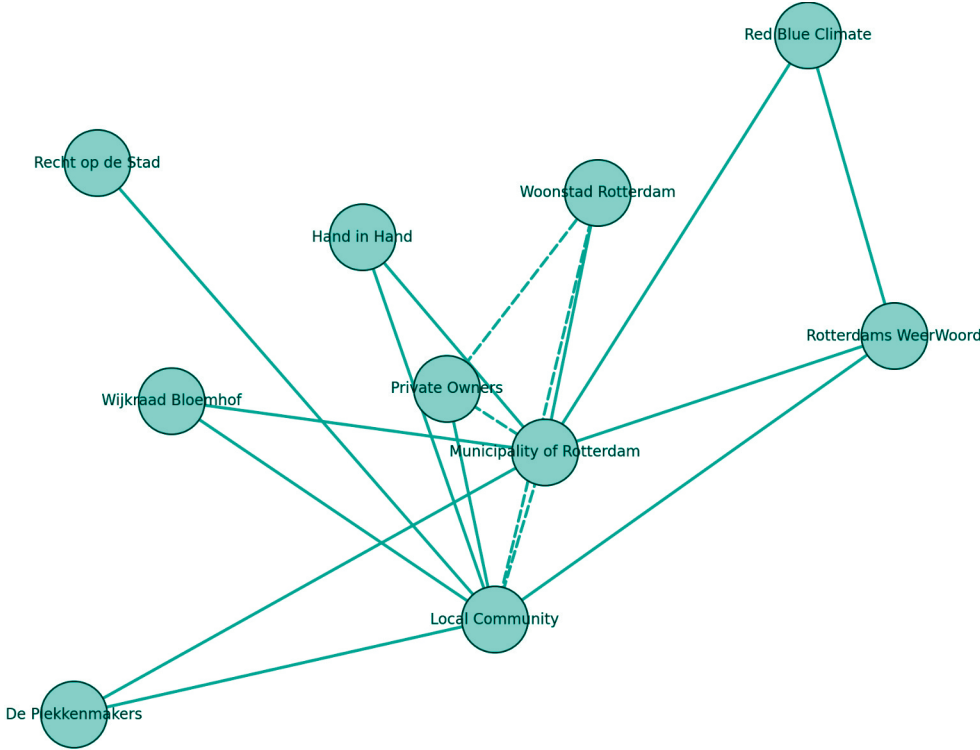
In Rotterdam's Bloemhof neighbourhood, a diverse array of stakeholders work to enhance the area's livability, sustainability, and resilience. These actors include:

- Woonstad Rotterdam
- Municipality of Rotterdam
- De Plekkenmakers
- Hand in Hand
- Red Blue Climate
- Recht op de Stad
- Rotterdams WeerWoord
- Rooftop Revolution
- Wijkraad Bloemhof
- Private Owners
- Local Community

The parties chosen are the ones that connect, work or are in direct relation with the subsidence and renewal problem in Bloemhof.

While collaboration between those is essential, tensions can arise when development plans proposed by the municipality or housing corporations do not fully align with residents' interests. Advocacy groups may challenge such plans to ensure that urban development is inclusive and equitable. On the other hand private interest of individuals can highly influence community's possibilities to enhance spatial qualities of the area.

In the following diagram I mapped connections between those stakeholders. Dashed lines are where I find most clashes happens, thus those are the relations I want to work with the most.



references

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bottom-up initiatives

Local Community

At the heart of Bloemhof’s transformation are its residents. The local community plays a crucial role in shaping the neighbourhood through participation in events, initiatives, and decision-making processes. Residents bring diverse perspectives and cultural richness, making them an indispensable part of Bloemhof.

De Plekkenmakers

De Plekkenmakers is a creative consultancy specialising in place-making and community engagement. In Bloemhof, they collaborate with residents and other stakeholders to create vibrant, functional spaces that reflect the neighbourhood’s identity. Their participatory approach ensures that the voice of the community is central to urban development projects. [108]

Hand in Hand

Hand in Hand is a grassroots organisation committed to fostering social cohesion and solidarity in Bloemhof. They focus on connecting residents, organising cultural and educational activities, and addressing social issues such as poverty and inequality. Their work strengthens the neighbourhood’s sense of unity and shared purpose. [109]

Recht op de Stad

Recht op de Stad is an advocacy group that fights for the rights of residents in urban areas, including Bloemhof. They focus on ensuring that urban development benefits the community rather than displacing or marginalising residents. Their efforts include campaigns for affordable housing and inclusive urban planning. [110]

references

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top-down parties



Municipality of Rotterdam

The Municipality of Rotterdam is a key player in urban planning, public services, and policy implementation in Bloemhof. They work on initiatives ranging from infrastructure development to social programs, with a strong focus on sustainability and inclusivity. Their efforts are aimed at addressing challenges like housing, employment, and public safety in the area. [111]

Woonstad Rotterdam

Woonstad Rotterdam is a housing corporation dedicated to maintaining and improving the quality of housing in the neighbourhood. They play a vital role in managing and renovating social housing, ensuring affordability, and fostering a sense of community among residents. Their work directly impacts the living conditions and overall appeal of Bloemhof. [112]



Red Blue Climate

Red&Blue (Real Estate Development & Building in Low Urban Environments), is a five-year transdisciplinary knowledge agenda and impact program focused on the development of integrated real estate and infrastructure climate risk strategies for the Dutch delta and beyond. Its a group of partnering research institutions and societal partners. [113]

Rotterdams WeerWoord

Rotterdams WeerWoord highlights the impact of climate change on daily life in the city, from flooding to extreme heat and drought. The initiative encourages residents, businesses, and organisations to take action—like greening roofs, adding rain barrels, or creating gardens—to make Rotterdam safer, greener, and more climate-resilient. [11]

references

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talk with woonstad

Violier en Rozemarijstraat

I had the opportunity to speak with Hannan Mataich from Woonstad Housing Corporation, who introduced me to their new development project - Violier en Rozemarijstraat. The project is a housing complex primarily designed for elderly residents. While its architectural features are noteworthy, our discussion focused on the development process and the challenges they encountered.

When the demolition of the previous building on the site was announced, it sparked significant protests from the community. These protests stemmed from various concerns, primarily related to the corporation's communication approach. The community felt excluded from the decision-making process and was deeply concerned about relocation options and the future of displaced residents. Additionally, several businesses expressed their desire to remain in the area.

After extensive sessions with protesters, the corporation reached an agreement that included modifications to the original plans and improved communication. They provided the community with clearer information about their situation and offered suitable relocation options.

conclusions

From our discussion, I gathered that this experience was a learning opportunity for Woonstad. They gained valuable insights into managing renewal projects and have since introduced new guidelines and policies to prevent similar issues in future developments.

Regarding the situation in the south of Bloemhof, Woonstad is aware of the severity of the challenges there. They are actively working to keep the community informed. However, they currently do not have a concrete solution, particularly due to the complexity of ownership in the area, as many properties are privately owned. It appears they are awaiting further action from the Municipality.

Woonstad has expressed a willingness to collaborate on addressing this issue and is open to sharing the information and resources they have.

talk with community

community observations

The approach to gathering information from the community does not involve formal interviews, as these can create a power imbalance and influence responses. Instead, I engaged in informal conversations while walking around the neighbourhood. While these interactions provided useful insights, I acknowledge their informal nature may limit reliability.

communication gaps

Many residents feel uninformed and uncertain about ongoing developments. Some received letters with insufficient details, leaving them unsure about the seriousness of the situation or how to respond. Others lack the time or capacity to seek clarity on their own, increasing their sense of fear and confusion.

structural issues

Residents reported severe subsidence problems, such as uneven sinking of homes and structural damage. One resident described her kitchen and bathroom sinking significantly, with water entering the bathroom through the toilet during heavy rain. The housing corporation's response—to replace the flooring—was seen as a temporary and inadequate fix. Uneven subsidence (houses sinking at angles) poses significant risks to buildings' structural integrity.

affordability concerns

Long-term residents paying low rents, around €300 per month, worry they will be unable to afford the higher rents of redeveloped social housing, those start from about a double of what they pay now. Many feel this is unfair and fear displacement.

These insights highlight pressing community concerns, but further systematic research is needed to fully understand and address these issues.

talk with municipality

preliminary communication

Prior to speaking with someone from the municipality, I exchanged emails with Astrid Overvoorde. From this exchange, I learned an important piece of information: the municipality collaborates with the consortium Red & Blue. I reached out to the consortium, but I have not yet received any information from them. Later, I had the opportunity to speak directly with Nienke Riemersma

discussion

Together with my two colleagues, I held a discussion with Nienke Riemersma. The conversation focused on various insights about the neighbourhood, particularly regarding safety and new developments. We addressed multiple aspects of safety, including perspectives specific to women. One key observation was that very few people are out and about in the neighbourhood, especially during the evening. Contributing factors include insufficient lighting, very dark areas, and narrow pavements, which create challenges for people with disabilities or those with children in strollers

lack of realisation

Interestingly, many residents seemed accustomed to these conditions and did not explicitly recognise a sense of insecurity unless it was pointed out to them. Some residents mentioned that they avoid going out after certain hours or shared anecdotes, such as witnessing someone urinating on a front door. However, they generally appeared unbothered by such incidents unless prompted to reflect on them.

eyes on the street

A major concern we identified is the lack of natural surveillance., as Jane Jacobs would call it 'eyes on the street'. Most buildings in the neighbourhood are residential, with no active street-level engagement. The absence of commercial spaces results in fewer people on the streets, contributing to a heightened sense of isolation and insecurity. As one person remarked, "If I scream for help here, no one is going to notice."

ownerships challenges

Do I have the right to perform suicide by consciously staying in deteriorating house and being crushed by its ruins?

the divide

The ground is sinking, causing buildings to crack and collapse, and many of these properties are now beyond repair. While most of the affected buildings are owned by housing corporations like Woonstad, some are privately owned, leading to a fragmented ownership structure. This divide has left many homeowners unable to afford repairs, and even if they could, the damage is irreversible. The result is a dangerous situation where homes continue to deteriorate, threatening the safety of residents and their neighbours.

at what point?

Many privately owned homes are surrounded by properties managed by corporations, creating additional tension. Homeowners face mounting financial strain, while their homes risk causing further damage to neighbouring buildings. At what point does ownership cease to be a right and become a public concern? Should the municipality step in, potentially taking ownership of properties to protect public safety?

joint effort

One solution could involve the municipality intervening to purchase or take control of these homes, especially when they become structurally unsafe. This approach would ensure that the neighbourhood's renewal doesn't depend on the financial viability of every individual owner but rather on the collective need for safety and redevelopment. The municipality could provide compensation, but this raises questions about fairness and how to calculate the value of homes that are sinking and losing their worth.

support

Cooperatives could play a supporting role in the larger redevelopment plan. These cooperatives could be incorporated into a government or housing corporation initiative, where local citizens may have a chance to manage parts of the neighbourhood, ensuring that redevelopment aligns with their needs. However, this model would require significant support and oversight from the municipality or housing corporations to ensure it integrates into the broader plan for renewal. They could help manage sections of the neighbourhood, but the larger-scale renewal and ownership decisions would likely need to remain with the municipality or housing corporations to ensure comprehensive, coordinated development.

the future

The future of Bloemhof will require a concerted effort from the municipality, housing corporations, and the residents themselves. While cooperatives can be part of the solution, they must work within the framework of a broader government-led or corporation-driven plan. The municipality should consider taking over unsafe homes, providing compensation to owners, and leading the way in rebuilding the neighbourhood. In addition, the renewal process should prioritise community involvement, transparency, and inclusivity to ensure that all residents have a stake in shaping the future of their neighbourhood.

figures

- The picture of the map on the was taken by the author in Wijkhub of Bloemhof thanks to the kindness of Nienke Riermersma.



ownership possibilities

The traditional model of private homeownership is increasingly being challenged by alternative forms of collective housing ownership.

| housing cooperatives | baugruppen |
|--|---|
| definition <p>Housing cooperatives (co-ops) are organisations owned and managed collectively by their members, who live in the housing provided. Instead of individuals owning separate units, the cooperative owns the entire property, and residents have shares that grant them rights to occupy a specific unit.</p> | definition <p>A baugruppe is a collaborative housing development model where a group of individuals jointly finance, design, and construct their housing projects, often without a developer.</p> |
| examples <p>Andelsboliger (Denmark)</p> <ul style="list-style-type: none">The Danish Andelsbolig system allows people to buy shares in cooperative housing associations rather than purchasing individual properties. This system keeps housing prices lower than in the private market, offering a buffer against speculation. [114] <p>Bostadsrättsförening (Sweden)</p> <ul style="list-style-type: none">Swedish co-op housing, known as bostadsrätt, allows residents to buy a right to use a flat, they collectively manage the property through a democratic process. [115] <p>FUCVAM (Uruguay)</p> <ul style="list-style-type: none">One of the largest cooperative housing movements in the world, FUCVAM promotes mutual aid housing, where members contribute labour (sweat equity) to reduce construction costs. [116] | examples <p>Spreefeld (Germany)</p> <ul style="list-style-type: none">Spreefeld is a cooperative-led development in Berlin where residents collectively manage their buildings and prioritize ecological sustainability. [117] <p>Vauban (Germany)</p> <ul style="list-style-type: none">The Vauban district in Freiburg, developed largely through Baugruppen, is a model of sustainable urbanism, featuring energy-efficient buildings, car-free zones, and co-housing initiatives. [118] <p>Sargfabrik (Austria)</p> <ul style="list-style-type: none">A self-managed cooperative that integrates housing with cultural spaces, Sargfabrik offers communal living while maintaining affordability. [119] |

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ownership possibilities

These alternatives aim to provide affordability, security, and community cohesion while reducing speculation in housing markets.

| co-housing | community land trusts |
|---|--|
| definition <p>Co-housing involves privately owned homes with extensive shared spaces, fostering community living. Residents collectively design and manage the property.</p> | definition <p>Community Land Trusts (CLTs) are non-profit organisations that own land collectively, ensuring long-term affordability. Residents purchase homes at below-market prices and agree to resale price restrictions.</p> |
| examples <p>Centraal Wonen (Netherlands)</p> <ul style="list-style-type: none">A nationwide network of co-housing projects where groups of people live in clusters, sharing communal facilities and social responsibilities. [120] <p>Settedammen (Denmark)</p> <ul style="list-style-type: none">One of the first modern co-housing communities, established in 1972, emphasising shared responsibility and collective decision-making. [121] | examples <p>CLT Brussels (Belgium)</p> <ul style="list-style-type: none">CLT Brussels provides affordable housing on collectively owned land, ensuring low-income residents can remain in gentrifying neighbourhoods. [123] <p>London CLT (United Kingdom)</p> <ul style="list-style-type: none">This model has been successfully applied in London, where CLTs help protect against real estate speculation. [124] <p>OFS-BRS (France)</p> <ul style="list-style-type: none">The French CLT model ensures housing remains permanently affordable by separating land and property ownership. [125] |
| mutual home ownership societies | |
| definition <p>This system enables collective mortgage financing, where residents pay monthly contributions that build equity in the property over time.</p> | |
| examples <p>Lilac (United Kingdom)</p> <ul style="list-style-type: none">The Low Impact Living Affordable Community (Lilac) operates on an MHOS model where members' payments are income-adjusted. [122] | |

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ownership opportunities

Each alternative housing ownership model provides unique benefits and challenges.

| housing model | pros | cons |
|---------------------------------|---|--|
| housing cooperatives | <ul style="list-style-type: none">- affordable rents and reduced speculation- democratic decision-making- strong community bonds- long-term housing security | <ul style="list-style-type: none">- requires strong management and participation- limited ability to accumulate personal equity- complex financing structure |
| baugruppen | <ul style="list-style-type: none">- cost savings by avoiding developers- customizable design- high sustainability standards- strong community networks | <ul style="list-style-type: none">- requires upfront capital from participants- long planning and coordination time- not suitable for large-scale housing needs |
| community land trusts | <ul style="list-style-type: none">- ensures permanent affordability- prevents displacement in gentrifying areas- encourages local control over land- supports mixed-income communities | <ul style="list-style-type: none">- requires significant public or nonprofit support- limited personal equity for homeowners- complex legal and financial structures |
| co-housing | <ul style="list-style-type: none">- strong community support system- encourages sustainable living- shared spaces reduce costs- high social resilience | <ul style="list-style-type: none">- requires significant social commitment- difficult to access traditional mortgage financing- can be costly if not subsidized |
| mutual home ownership societies | <ul style="list-style-type: none">- income-based payments make homeownership more accessible- collective financial security- limits speculation | <ul style="list-style-type: none">- requires government or institutional backing- less financial return for residents- not widely implemented outside the uk |

applying ownership models

Bloemhof, a historically working-class neighbourhood facing housing deterioration, affordability crises, and displacement risks, could benefit from a combination of these models. Below is an analysis of how each model could contribute to the renewal strategy.

housing cooperatives: supporting community stability

what it brings to Bloemhof

- Can help retain affordability and prevent displacement due to rising housing costs.
- Provides long-term housing security for low-income residents.
- Encourages resident participation, fostering stronger community bonds.

challenges:

- Requires initial financial backing from the city or housing associations.
- Needs ongoing community management and governance training.

baugruppen: a model for sustainable urban infill

what it brings to Bloemhof

- Enables cost-efficient, resident-driven development, reducing reliance on speculative developers.
- Encourages sustainable building practices, improving Bloemhof’s environmental resilience.
- Can be used for small-scale urban renewal rather than mass demolition.

challenges

- Requires a group of committed residents willing to co-invest and co-design.
- Long coordination periods may slow the pace of housing delivery.

ownership opportunities

The following table compares these models based on key factors such as affordability, sustainability, community engagement, and scalability.

community land trusts: protecting affordability long-term

what it brings to Bloemhof

- Prevents land speculation and ensures permanently affordable housing.
- Reduces gentrification pressures, ensuring that local residents can remain in the area.
- Encourages local governance over land use.

challenges

- Requires strong public or nonprofit partnerships to establish the trust.
- Can be legally and administratively complex to implement.

co-housing: encouraging social cohesion

what it brings to Bloemhof

- Creates strong social networks, reducing social isolation and fostering a sense of belonging.
- Promotes shared resources and sustainable urban living.
- Supports community-led design to fit local needs.

challenges

- Not all residents may want a highly communal living environment.
- Requires strong resident engagement and self-management.

mutual home ownership societies: affordable ownership model

what it brings to Bloemhof

- Makes homeownership accessible for lower-income residents through incomebased payments.
- Creates a balance between renting and full ownership, allowing for equity accumulation.
- Can be adapted to social housing models.

challenges

- Needs government support to kickstart financing models.
- Limited experience with MHOS in the Netherlands, requiring pilot projects.

approach for Bloemhof

Given the housing and social challenges in Bloemhof, the best approach is a combination of different models rather than relying on a single one.

community land trusts + housing cooperatives

- CLTs can own the land, preventing speculation, while co-ops manage the buildings democratically.
- This ensures affordability, stability, and resident control over housing.

co-housing + social housing partnerships

- Some new developments should include co-housing models with shared spaces and sustainability features, ensuring a socially resilient urban renewal.

mutual home ownership societies + baugruppen

- If supported by government-backed financing, MHOS can provide accessible ownership for working-class families in Bloemhof.
- Resident-led Baugruppen projects can be piloted on vacant or redeveloped plots, integrating sustainable housing designs.

conclusion

The renewal of Bloemhof presents an opportunity to break away from traditional speculative housing models and embrace community-driven, sustainable, and affordable alternatives. By implementing a mixed strategy, Rotterdam can ensure that Bloemhof’s transformation benefits its residents rather than displacing them.

Affordable & stable housing

– through cooperatives and CLTs.

Community participation

– through Baugruppen and co-housing.

Sustainability & resilience

– by not-money oriented urban design.

Avoiding displacement

– by protecting affordability and ownership rights.



personal observations

“Stare. It is the way to educate your eye, and more. Stare, pry, listen, eavesdrop. Die knowing something. You are not here long.” [117]

method

One of the key aspects of my method for analysing the site was spending extended periods there, visiting multiple times, and simply wandering around. The goal was to observe and listen to what was happening. Over the course of more than fifteen visits, I walked for hours, took photographs, and immersed myself in the ambience of the neighbourhood. These visits provided me with numerous insightful observations. This page is focused on autumn and winter time, the next one on spring and summer.

silence

The first thing I noticed, particularly during my afternoon visits, was how quiet the neighbourhood is. Apart from the distant sound of cars on the main streets, an unusual silence seemed to pervade the area. This quietness remained a defining feature throughout most of my visits. The only exception was the school and playground located in the western part of the site. Occasionally, I would see two or three children playing there, but the activity was minimal.

traffic and an advice

Another notable observation was the contrast between mornings and evenings. During these times, there was a significant amount of car movement. Despite this, the neighbourhood still felt devoid of people—it was just cars passing through. At times, the streets felt busy, but the area didn't necessarily feel safe. There weren't many walkable spaces, except for the canal area. Speaking of the canal, during one of my walks there, a woman from a nearby group of people commented on my camera, complimenting it but also warning me to be careful, as someone might try to steal it. Fortunately, I didn't encounter any issues.

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worries

Given how few people were outside, I drew some attention during my visits. On one occasion, when I was photographing a building, a concerned woman approached me from the house and asked why I was taking pictures. After I explained my purpose, she was understanding and returned to her home. I think it illustrates certain worries and atmosphere of the site.

fireworks

In the late evenings, I noticed that most of the apartments remained dark, with no lights on. This made me wonder whether the residents worked late hours or if the apartments were unoccupied. I also heard frequent fireworks, which I initially attributed to the New Year season. However, it was still three weeks before, so this seemed unusual—especially as it contrasted with the neighbourhood's quiet atmosphere.

front gardens

The signs of subsidence were evident in several parts of the neighbourhood. I observed multiple cracks in the buildings and uneven ground levels. Another aspect that caught my attention was the individuality displayed in the residents' front gardens. Many were decorated with personal items. During the Christmas season, there was an abundance of decorations and lights throughout the neighbourhood, further highlighting its unique character.



personal observations

“To dwell is to be set at peace, preserved within the free sphere that safeguards each thing in its essence.” ^[127]

seasonal changes

The site visits during early spring differed significantly from those in autumn and winter. Warmer weather likely contributed to increased outdoor activity, with more residents visible across the neighbourhood.

demographic observations

The southeast area had a higher concentration of Dutch residents. Other zones, particularly near the central market, were populated by migrant communities, with languages like Arabic, Turkish, and Surinamese commonly heard. The northwestern part of the site remained the least inviting. Turned off house light and no visible activity of people left me with strange feeling.

social activity

The canal area became a focal point for gatherings. Families, teenagers, and elderly individuals occupied the banks, with children playing loudly nearby. This contrasted sharply with the quieter winter months. Most house gardens appeared unused. Many were overgrown or cluttered with debris, but some showed signs of maintenance or personalisation.

public behaviour

Groups of people were observed drinking at benches along secondary streets deep into the neighbourhood. Their presence highlighted ongoing issues with informal gatherings in public spaces. On the other hand, in different part of the neighbourhood, children played loudly, especially near playgrounds and wider alleys. Football matches on the street and other games were common, creating a lively atmosphere absent in colder seasons.

local complaints

Residents raised specific concerns. A couple criticised the recent removal of mature trees, citing loss of shade. Another person noted parking issues as a lot of cars are parked outside the assigned spots. Additionally, one visit, I was again warned by a local resident to guard my camera, echoing previous cautions about theft in the area. Despite that, nothing happened and I never felt truly worried.

to be continued

These walks significantly broadened my perspective of the neighbourhood. I believe there is still untapped potential in this method of observation, so I plan to continue exploring the site in the future.

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community needs

list of community needs

safe and stable housing

- Address severe soil subsidence causing structural damage.
- Permanent solutions to replace temporary fixes.

affordability and anti-displacement measures

- Ensure redevelopment does not displace long-term residents.
- Maintain affordable social housing options post-renewal.

equitable development

- Avoid gentrification and ensure mixed-income housing to retain socio-economic diversity.
- Legal frameworks to address ownership complexities.

sustainable renewal

- Implement climate-resilient infrastructure.
- Promote circular construction practices.

community engagement

- Adopt participatory planning models to align projects with local priorities.
- Collaborate with grassroots organisations.

improved safety and public spaces

- Reduce crime, vandalism, and alcohol-related disturbances.
- Enhance street lighting, widen pavements, and create pedestrian-friendly areas.
- Develop green spaces and parks to mitigate the urban heat island effect.

cultural sensitivity and social cohesion

- Respect the neighbourhood's multicultural identity.
- Foster community bonds through cultural events and shared spaces.

infrastructure upgrades

- Improve public transportation and reduce car dependency.
- Address traffic safety and pedestrian accessibility.

transparent communication

- Clear, accessible information about redevelopment plans and timelines.
- Active inclusion of residents in decision-making processes to avoid mistrust.

key overarching challenges

ownership divide

Privately owned vs. corporation-owned properties require coordinated intervention.

displacement risk

Minimise risk of displacement by phased implementation and community participation.

phased implementation

Minimise disruptions through gradual renewal while keeping residents informed.

climate resilience

Integrate nature-based solutions to stabilise the environment.

chapter - 6

towards the design



architectural scenarios

“Vrijwel de hele wijk Bloemhof is verzakt, de huizen zakken langzaam de grond in” ^[128]

scenarios

When developing a new architecture for the Bloemhof neighbourhood, multiple scenarios must be considered. If the design prioritises collaboration with and for the community, it is essential to account for varying levels of resident cooperation. This paper examines three primary scenarios: demolition, structure enhancement, and preservation. Additionally, a fourth scenario—flood adaptation—is proposed as a forward-thinking concept to future-proof the design, despite its seemingly distant feasibility.

preservation

This scenario addresses cases where residents decline collaboration. Here, properties remain untouched if owners prefer to independently renovate or reject intervention entirely. However, structural assessments may still be conducted to identify potential hazards, ensuring safety without imposing changes on unwilling participants.

demolition

This scenario evaluates the logistical challenges and societal impacts of demolishing existing structures to rebuild resilient, modern buildings. The approach emphasises phased demolition to reduce disruption to residents and the community. A key consideration is the sustainable reuse of materials from demolished buildings, which aligns with circular economy principles. Salvaging materials not only minimises waste but also preserves elements of the neighbourhood’s architectural heritage.

structure enhancement

This scenario investigates retrofitting and reinforcing existing buildings, particularly those with high architectural value, to improve their resilience. One proposed strategy involves adding new floors atop existing structures. While this may necessitate temporary relocation of residents to nearby housing, efforts will prioritise allowing residents to retain ownership of their properties if desired. The goal is to modernise infrastructure while respecting residents’ autonomy.

flood adaptation

This scenario explores designing buildings to accommodate periodic flooding by allowing ground floors to flood while keeping upper floors habitable. It examines engineering solutions such as flood-resistant materials, elevated foundations, and adaptable ground-floor layouts. For instance, using waterproof materials for ground floors while employing conventional methods for upper levels could mitigate damage. The focus is on creating resilient living spaces that protect residents and property during flood events.

variety

The redevelopment of Bloemhof neighbourhood demands a flexible, community-centric approach that prioritises diverse needs and future uncertainties. By balancing demolition, structural enhancement, preservation, and flood adaptation strategies, the design should accommodate varying levels of resident collaboration while fostering resilience and sustainability. Adaptation to the community needs and variety of possible solutions should be one of the main principles in such renewals.

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renewal timeline

This chapter discuss a concept of timeline for Bloemhof’s renewal.

| phase 1: preparatory groundwork (years 1–2) | phase 2: participatory planning & co- design (years 2–5) |
|---|--|
| key actions technical assessments <ul style="list-style-type: none">• Conduct geotechnical surveys to map soil subsidence severity and flooding risks.• Inventory buildings at risk (foundation type, structural integrity, ownership status).• Develop partnerships for climate-resilient infrastructure planning. stakeholder mapping & governance framework <ul style="list-style-type: none">• Identify all stakeholders.• Establish a renewal committee with equal community and institutional representation. community engagement <ul style="list-style-type: none">• Host town halls to explain the renewal’s purpose, scope, and process.• Distribute multilingual surveys to gather priorities (e.g., housing, safety, green spaces).• Coordinate various community interest groups. psychological support infrastructure <ul style="list-style-type: none">• Partner with local NGOs to offer counselling for residents experiencing anxiety about displacement.• Train community leaders in conflict resolution and trauma-informed communication. outcome <ul style="list-style-type: none">• A shared understanding of challenges, priorities, and governance structure. | key actions visioning workshops <ul style="list-style-type: none">• Co-create neighbourhood goals (e.g., “affordable, flood-resistant housing with cultural identity”).• Use interactive tools to visualise scenarios. material reuse strategy <ul style="list-style-type: none">• Audit salvageable materials (bricks, windows) from buildings slated for demolition.• Collaborate with architects, designer, urbanists, NGO’s for circular construction plans. legal & financial frameworks <ul style="list-style-type: none">• Develop compensation models for private owners of sinking homes.• Secure funding from grants and city’s budget. phasing strategy <ul style="list-style-type: none">• Divide Bloemhof into zones for staggered renewal to minimise displacement.• Prioritise areas with the worst subsidence. demolition mapping <ul style="list-style-type: none">• Map with the residents which buildings are going to be demolished and which ones are being protested against demolition.• Decide on architectural scenario for every building. outcome <ul style="list-style-type: none">• A ratified “neighbourhood renewal masterplan” with phased priorities. |

renewal timeline

duration: 8–10 years in phased approach

| phase 3: phased implementation (years 5–8) | phase 4: post-renewal integration & monitoring (years 8–10+) |
|---|---|
| key actions per phase preparation of “snowball effect” <ul style="list-style-type: none">• Map potential free areas to start with, first building.• Build first building in order to relocate residents without community displacement.• Idea behind “snowball effect” and “undisplacement” method is going to be explained in later chapter. relocation support <ul style="list-style-type: none">• Offer residents in temporary or permanent housing within Bloemhof.• Provide relocation stipends and mental health check-ins during transitions. demolition & material harvesting <ul style="list-style-type: none">• Deconstruct buildings using circular methods• Repurpose elements from demolished buildings for new constructions, pavilions, landscaping, or community art projects. rebuilding & infrastructure upgrades <ul style="list-style-type: none">• Construct flood-resistant, pile-supported social housing with ground-floor commercial spaces.• Implement green infrastructure like rain gardens, permeable pavements, urban forests, or Miyawaki forests. community monitoring <ul style="list-style-type: none">• Host monthly “site walkthroughs” for residents to inspect progress and provide feedback.• Use a digital participation platform for real-time updates and grievance reporting. cross-cutting themes safety: <ul style="list-style-type: none">• Install lighting, widen pavements, and design for human interaction and presents at the street. cultural preservation: <ul style="list-style-type: none">• Integrate public art reflecting Bloemhof’s multicultural heritage, like murals, community gardens, pavilions. | key actions community reintegration <ul style="list-style-type: none">• Organise a homecoming festival to celebrate completed phases.• Prioritise original residents for new housing. long-term evaluation <ul style="list-style-type: none">• Annual surveys to assess social cohesion, economic mobility, and satisfaction.• Monitor subsidence and climate resilience. ongoing psychological & economic support <ul style="list-style-type: none">• Establish a community resilience fund for emergency home repairs.• Partner with NGO’s to run job-training programs. outcome <ul style="list-style-type: none">• A stable, socially cohesive neighbourhood with improved housing, climate resilience, and economic opportunities. remarks transparency: <ul style="list-style-type: none">• Publish all decisions, budgets, and meeting minutes in accessible for residents ways. equity: <ul style="list-style-type: none">• Ensure 70% of new housing remains affordable. adaptability: <ul style="list-style-type: none">• Allow the masterplan to evolve based on community feedback and climate data. undisplacement <ul style="list-style-type: none">• Make sure to replace homes, not communities. jwork <ul style="list-style-type: none">• In such a renewal, a lot of people have to be involved, and it can be an opportunity for unemployed citizens. foster grassroots organisation <ul style="list-style-type: none">• Citizens may organise themselves in housing cooperation or other forms of groups. Embrace it and work together with them. |



design idea

undisplacement method

The proposed housing system operates on a phased relocation principle. New modular units are constructed in gaps between existing buildings or atop structurally reinforced structures. Residents move directly into these units, avoiding temporary displacement. Once relocated, their original homes are demolished, clearing space for subsequent phases. This "snowball" approach ensures residents move only once, retaining social and spatial ties to Bloemhof.

modular and adaptive structure

The design employs a flexible grid of prefabricated modules, adjustable to variable plot widths. Modules combine vertically and horizontally, allowing apartments to expand or contract based on household needs—e.g., a single modul for small families, or merged units for growing households. Structural integrity is maintained via a glulam beam-and-column frame, infilled with compressed straw panels for insulation and affordability.

material strategy

organic & low-cost:

Straw panels and glulam reduce costs and carbon footprint.

reclaimed materials:

Salvaged bricks clad the first two floors, blending with Bloemhof's historic fabric. Upper floors use untreated wood cladding, ageing naturally.

circular reuse:

Demolished materials (e.g., tiles, metal) are repurposed as landscaping fill, playground features, or public art.

greenery and privacy gradients

public:

Central courtyard with trees, benches, ponds and communal gardens.

semi-public:

Openwork staircases with spacious landings for casual interaction.

semi-private:

Rooftop gardens divided by pergolas, offering shared growing spaces.

private:

Individual terraces with planter boxes for personal use.

urban integration

contextual fit:

Modules slot between preserved historic buildings or atop retrofitted structures, maintaining Bloemhof's fragmented urban rhythm.

climate resilience:

Green roofs and permeable pavements mitigate flooding, while tree-lined streets reduce heat islands.

safety and accessibility:

Wide, well-lit pavements and visual connectivity deter crime.

scalability and flexibility

Each module functions as a self-contained building, enabling incremental growth. Future phases can incorporate new units or adapt existing ones, ensuring the system evolves with the community. By binding affordability, adaptability, and ecological reuse, the design transforms renewal into a tool for continuity—proving social housing can be both dignified and dynamic.



summary

This research explores the issue of soil subsidence in Bloemhof, a neighbourhood in South Rotterdam, and proposes sustainable and community-centred redevelopment strategies to mitigate its impact. The study emphasises preserving community identity while addressing housing and environmental challenges.

soil subsidence and housing instability

Soil subsidence, the gradual sinking of land, is a major issue in Bloemhof due to the region's soft, marshy ground. Many buildings in the neighbourhood were constructed in the early 20th century with inadequate foundations, often without any foundation at all. The resulting damage includes:

- Cracked walls and uneven floors,
- Flooding issues due to improper drainage,
- Structural instability, leading to large-scale demolitions.

The worst-affected area is the southern part of the neighbourhood, where displacement of residents is becoming a pressing concern.

the concept of “undisplacement”

Research introduces the idea of undisplacement, meaning redeveloping without uprooting the local population. This approach prioritises:

- Architectural continuity, preserving elements of the neighbourhood's character.
- Phased redevelopment, minimising disruption for current residents.
- Snowball effect planning, making sure that residents stay in the neighbourhood.
- Community engagement, ensuring that the transformation reflects local needs.

historical and social context

Bloemhof was developed in the early 20th century as a working-class district for labourers in Rotterdam's expanding port industry. Today, it has become a multicultural neighbourhood that faces various socio-economic challenges:

- Low-income levels and high unemployment,
- High crime rates and social instability,
- Urban heat island effects due to a lack of greenery.

case studies and theoretical frameworks

The research point variety of case studies and philosophies that the author takes inspiration from.

- Ideas as “natureculture”, “dark ecology” and “the nature of the fourth kind” play crucial role in ecological aspect of this paper.
- Jane Jacob's, Jan Gehl's and Henri Lefebvre's ideas play crucial role in the urban and community aspect of this research.
- Works of Henning Larsen and Lendager are main inspiration for circularity and materiality of the renewal.
- The paper also analyses several case studies of similar renewals across the globe, in lookout for community-driven practices.

strategies for sustainable redevelopment

The study proposes set of focus points for Bloemhof's transformation:

- Engaging residents in the planning process.
- Retaining the neighbourhood's distinct identity.
- Integrating public spaces to foster social cohesion.
- Avoiding large-scale demolitions.
- Introducing adaptive infrastructure solutions, such as pile-based construction to counter subsidence.
- Utilising recycled materials from old structures to create affordable housing.
- Building from organic materials to enhance circularity and economy of the development.

vision for Bloemhof's future

The paper argues that the redevelopment of Bloemhof should be seen as an opportunity rather than a crisis. By embracing “undisplacement”, the neighbourhood can undergo environmentally responsible, socially inclusive, and economically viable renewal while preserving its community spirit. The study ultimately seeks to influence broader discussions on urban renewal and inspire sustainable strategies for vulnerable districts.

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