Revitalising Post-War Mass Housing Through Sustainable Conservation

AR3AH105 Heritage Graduation Studio:
Resourceful Housing, Adapting 20th Century Heritage

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Glossary

Urban Renewal
Urban renewal refers to the process of redeveloping urban areas which have become disused or have fallen into decay. This can involve replacing ageing buildings, intensifying the land use through densification, or redesigning the public space. Urban renewal is often seen as being at odds with heritage preservation.

Gentrification
Gentrification is a form of urban renewal whereby traditionally low-income neighbourhoods are gradually transformed through the development of new more expensive housing, resulting in the displacement and exclusion of low-income households. Gentrification takes different forms depending on the context: van Gent (2013) shows how it has developed in Amsterdam and its exclusionary effects were demonstrated by (Hochstenbach & Musterd, 2021).

The Right to Housing
Defined by the UN Human Rights Committee (1991) as the right to adequate shelter which includes: security of tenure, availability of services and infrastructure, affordability, habitability, accessibility, location and cultural adequacy.

Doughnut Economics
Doughnut Economics is a framework for sustainable development (Raworth, 2017), which proposes a 'safe and just space for humanity' that exist between an 'ecological ceiling' and a 'social foundation'. This model proposes to measure the performance of an economy not in terms of GDP growth, but by the extent to which it meets the needs of people, without overshooting the earth's ecological carrying capacity.

Ecological Ceiling
The ecological ceiling is based on the the Planetary Boundaries framework (Rockström et al., 2009), an attempt at defining and measuring the limits and boundaries of the Earth's ecosystems and natural resources. It represents the maximum levels of human activities that can be sustained without a high risk of triggering significant ecological degradation or exceeding the planet's capacity to regenerate (Hill-Hansen & Jensen, 2023).

Social Foundation
The social foundation is based on the social and economic SDG's proposed by the UN, defining the minimum set of social standards and conditions that are considered necessary for human well-being and a dignified life. The social foundation provides the basis for ensuring social equity and distributive economic development (Hill-Hansen & Jensen, 2023).

Planetary Boundaries
The planetary Boundaries framework (Rockström et al., 2009) defines nine planetary systems within which humanity must stay within to ensure a stable earth system. When planetary boundaries are exceeded, there is an increased risk of large scale, abrupt or irreversible environmental changes. As of 2023 six of the nine boundaries have been crossed.

Heritage
"The resources inherited from the past that communities wish to pass on to future generations. It is an ecosystem that includes tangible and intangible dimensions resulting from the interaction between nature, fabric, and people through time." (Gonçalves et al., 2021)

Sustainability
"The state of equilibrium in which the components of the ecosystem comprised by nature, humans and built environment, and its functions are maintained for present and future generations." (Gonçalves et al., 2021)

Heritage Environment
"Heritage environment concerns the irreplaceable and non-renewable resources that form the overall urban ecosystem, with natural, tangible and intangible elements. It is an economic asset, knowledge capital and it ensures a better quality of life for present and future generations" (Gonçalves et al., 2021)

Sustainable Conservation
"The processes of management of change of the ecosystem inherited from the past, so its resources can benefit present generations while retaining its value for future generations." (Gonçalves et al., 2021)

Figure 1.1

1 Introduction

This research is focussed on the large-scale urban renewal taking place in the post-war neighbourhood of Amsterdam Nieuw-West. This neighbourhood was once planned to become one of the largest urban renewal projects in the world. In 2001 the municipality of Amsterdam released a document called 'Richting Parkstad 2015' (Gemeente Amsterdam, 2001) in which they proposed to demolish 13.300 of the post-war dwellings and build 24.300 new dwellings, in the period leading up to 2015. Due to the 2008 financial crisis these numbers were never realised, instead around 7000 dwellings were demolished, and 9500 new dwellings were constructed. After the 2008 financial crisis an apparent shift towards refurbishment did occur, along with an increased recognition of the heritage significance of the area (Havinga et al., 2020, p. 4). However, after two decades of steady urban renewal, the challenges of overdue maintenance and an urgent need to improve energy performance remain, while the demand for affordable housing continues to grow. At the same time, socio-spatial inequality has only increased, particularly between blocks that have been extensively renewed and those that have seen hardly any improvement (Nio et al., 2016, p. 174). This current approach to urban renewal appears increasingly unviable as it leads to [1] **gentrification and displacement**, results in an unnecessary amount of [2] **material waste**, and erases the unique [3] **identity and history** of neighbourhoods.

[1]   Gentrification and displacement. In the 90s, social housing increasingly started to be seen as problematic, it became associated with poverty concentrations and social disorder. To combat this, the government encouraged the construction of owner-occupied and private rented housing to promote socio economic diversification (Musterd & Ostendorf, 2008), a process which became known as state-led gentrification (van Gent, 2013). At the same time the housing corporations, that own most of the housing stock in Nieuw-West, were privatised. As such, they became dependant on market activities, such as selling off their existing stock, converting social-housing to private rent, and building owner occupied housing, to generate the income needed to build new social housing (Teernstra & Pinkster, 2016). The shift to market lead development has been associated with the displacement and exclusion of low-income households to the suburbs around the city (Hochstenbach & Musterd, 2021). Nieuw-West has also seen a notable decrease in ratio of social housing units, from 76% in 2000, to 53% in 2016 (Nio et al., 2016, p. 19), and remaining tenants are increasingly and disproportionately affected by energy poverty compared to homeowners (Mulder et al., 2022).

[2]   Material waste. Construction and demolition waste (CDW) is responsible for over a third of all waste generated in the EU (Bilsen et al., 2018), and the Duch building sectors material use is responsible 11% of total carbon emissions (Hekma, 2021). The Netherlands has one of the highest per capita CDW generation rates in the EU, at 1390 kg per person in 2014 (Villoria Sáez & Osmani, 2019). It does however, also have the highest material recovery rate

of all EU countries, with only 1% of mineral CDW ending up in landfill (Villoria Sáez & Osmani, 2019). Unfortunately, most of this re-use is in the form of downcycling, and the use of secondary materials for housing and utility buildings in particular was only 7% in 2014 (Arnoldussen, 2022). The national housing construction goal of 100.000 dwellings per year, and commitments to the Paris agreement are incompatible with the current approach. If the Dutch construction industry continues businesses as usual, it will exceed its carbon budget for a 1,5-degree warming scenario by 2027 (Bosch et al., 2023). Areas like Nieuw-West, where much of the material demand is used to replace existing dwellings rather than adding to the total supply, hold significant potential for building and material re-use.

[3]   Loss of identity and history. Despite a complex and extensive system of heritage listings, most buildings outside the historic canal belt have very little concrete legal protections, and demolition and new construction remains the de facto method for urban renewal. Gonçalves (2023) found that one of the reasons practitioners generally prefer demolition is that there is an emphasis of economic criteria in decision-making, while less tangible values like inhabitants' health, maintenance costs, the environmental impact of the intervention, and heritage value are often under-represented in the decision-making process. Floor Milowski argues that in Amsterdam specifically, the economic function has taken precedence over the social cultural function, and that this is leading to a loss of diversity and of unique identities of districts, causing the city to become increasingly homogenised (Milowski, 2022).

The thing that unites these problems is the way in which the value of cities and buildings is conceptualised and measured. Under the current system, housing has become increasingly commodified, and the exchange value of buildings has been prioritised over the use value. To combat this, it is necessary to move away from market lead development, with its overemphasis on the rights of private property and profits, towards new forms of development and governance which once again serve the public interest, and in which existing values are collectively managed and preserved.

1.1 Linking Heritage to Sustainable Development

There has been an ongoing effort amongst Amsterdam policymakers to better protect and retain the value of existing urban areas. For example, by integrating (intangible) heritage values into sustainable development goals (Gemeente Amsterdam, 2021, p. 222). These ideas are elaborated in the 'CGO (circular area development) framework' (Gemeente Amsterdam, 2019), based on the Doughnut Economics Model (Raworth, 2017). The CGO framework proposes a systematic approach to circular development which starts with the identification of existing forms of value, both tangible and intangible (Gemeente Amsterdam, 2019, p. 56). While some existing values are proposed, concrete indicators to measure these values are yet to be defined.

In academia, the integration of heritage and sustainability has been a topic of investigation for some time (Appendino, 2018; Berthold et al., 2015; Guzmán et al., 2017; Landorf, 2011; Norrström, 2013; Zamperini & Cinieri, 2013, 2017).

However, these tend to focus on only one of the dimensions of sustainability; social, economic, or environmental, at a time. Comprehensive frameworks integrating heritage across all three dimensions have been proposed (Gonçalves, 2023; Pereira Roders, 2007), but there remains a gap in the transfer of knowledge to professional practice (Gonçalves, 2023, p. 97).

This research attempts to bridge this gap between theory and practice by exploring the potential application of sustainable conservation methods to rehabilitate decaying Dutch mass housing neighbourhoods, with a particular focus on the post-war housing in Nieuw-West. The research into renewal in Nieuw-West is substantial, and extensive mapping of socio-spatial changes at various scale levels has been done in the past (Hoog & Wit, 2022; Nio et al., 2009, 2016). However, the link between heritage and sustainability was not a focus in these works. Therefore, the contribution of this research comes mainly from the way it maps the impact of urban renewal across both social and environmental dimensions. To this end, it will focus on a smaller case study area, the Kolenkitbuurt, that has received less attention in the existing literature. It will compare different approaches to renewal, to demonstrate the potential of heritage conservation for achieving social and environmental sustainability.

1.2 Research Questions

The main research question of this thesis is:

How can the post-war mass housing heritage of Amsterdam Nieuw-West facilitate sustainable urban renewal practices?

The main question is broken down in to sub-questions, and the research will consist of several phases:

1 **Analysis of spatial changes and resource flows through a case study neighbourhood**

RQ1.1: What physical and socio-spatial changes have occurred as a result of the urban renewal process and what has been their environmental and social impact?

2 **Defining key indicators for heritage environment values**

RQ2.1: How can we measure the impact of urban renewal interventions on the heritage environment?

3 **Comparative analysis of renewal methods and values through case study projects**

RQ3.1: How do different approaches to renewal compare in terms of heritage values, social outcomes, and environmental impact?

RQ3.2: How are the different values and stakeholders represented in the decision-making process?

4 Values based redesign of a heritage environment in Amsterdam Nieuw-West

RQ4.1: What would urban renewal look like if all inherited values, physical, social, and environmental, were represented in the decision-making process and the benefits of renewal were distributed among the community in an equitable way?
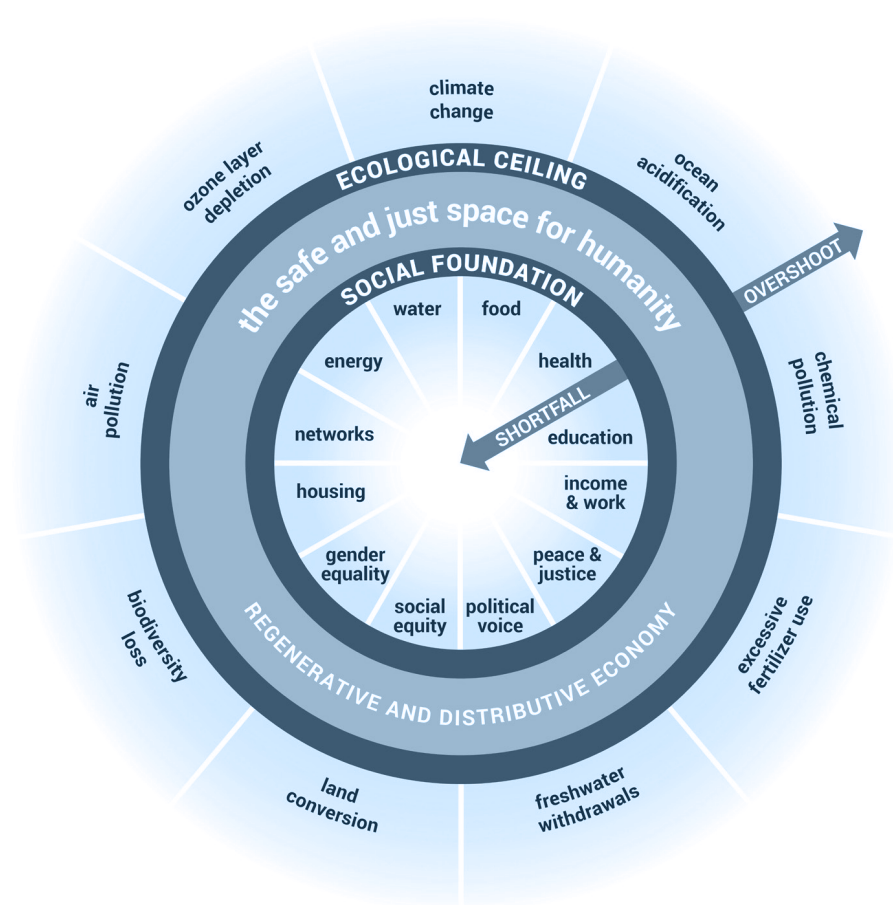
Figure 2.1, doughnut of social foundation and planetary boundaries (Raworth 2017) adapted from (Hill-Hansen & Jensen, 2023).

Figure 2.2, uniting the concepts of heritage and environment in three layers: intangible, tangible and natural (Gonçalves et al., 2022).

2 Methodology

2.1 Theoretical Framework

This research uses the 'Doughnut Economics' approach of sustainable development (Raworth, 2017), which proposes that a 'safe and just space for humanity' exist between an 'ecological ceiling' and a 'social foundation'. This model proposes to measure the performance of an economy not in terms of GDP growth, but by the extent to which it meets the needs of people, without overshooting the earth's ecological carrying capacity. This model has been adopted for use in urban planning policy by the municipality of Amsterdam in the 'Environmental Vision 2050' (Gemeente Amsterdam, 2021). Others have proposed specific indicators for its use in urban development (Hill-Hansen & Jensen, 2023). However, in this framework the value of the existing built environment is not fully considered. In the context of existing urban areas, there are already many material and immaterial resources which could be used to achieve positive social outcomes with minimal impact on the environment. For this the heritage values framework (Pereira Roders, 2007), and the concept of the 'heritage environment' are used. The heritage environment includes "the irreplaceable and non-renewable resources that form the overall urban ecosystem, with natural, tangible and intangible elements" (Gonçalves et al., 2021).

2.2 Methods and Sources

This research uses a mixed methods approach. First, to better understand the relationship between the social and environmental impact of urban renewal, the socio-spatial changes and associated resource flows in the case study area are mapped at a neighbourhood level. This scale was chosen because it is small enough to study physical changes to the environment in detail, but large enough to compare these changes against publicly available social indicators. This is done using statistical data from Amsterdam's O&S (research and statistics) department, maps and plans from the city archive, and GIS data from the cities open data platform. Second, a literature review of existing sustainable development and heritage frameworks is done to define a set of indicators to measure tangible and intangible values in the heritage environment that is relevant to the context and scale level of the case study. For this, it draws primarily from sustainable heritage indicators developed by (Gonçalves et al., 2022) and circular development indicators by (Hill-Hansen & Jensen, 2023). Third, to compare the impact of specific intervention strategies at the building level, a selection of case studies from Nieuw-West, representing various approaches to renewal, are analysed using the previously defined indicators. The findings from the research phase will be used to redesign a residential building, in the case study neighbourhood, by leveraging the values and resources from the heritage environment.

2.3 Scope and Limitations

The case study area of the Kolenkitbuurt will be constrained to zones ED01 and ED02. ED03 & 04 are technically part of the Kolenkit but will be excluded as they have a very different character and history. ED03 is separated by the

Methodology	Expected Results

P1 Socio-Spatial Mapping

Mapping of social and physical changes in the case study area between 2005 and 2022 using opensource databases

R1 Impact of Contemporary Renewal

Drawings, models, and alluvial diagrams showing social and environmental outcomes of urban renewal in the Kolenkit

P2 Literature Review

Review of the state-of-the-art on heritage value frameworks relating to sustainable development

R2 Sustainable Heritage Indicators

A set of indicators to measure the degree to which tangible and intangible values in the heritage environment are preserved

P2 Comparative Analysis

Comparing performance of different interventions in the case study area based on heritage value indicators

R3 Impact of Specific Interventions

Comparison matrix and gravity map showing what sustainable heritage values were applied in case studies

P3/4 Values Based Redesign

Applying the findings of P1&2 to design of an intervention to demonstrate the benefits of sustainable conservation

R4 Sustainable Conservation Plan

Proposal that adapts existing situation to current needs while preserving key parts of the heritage environment

P4 Impact Assessment

What has been the impact of the intervention and how does it compare to case study interventions?

R5 Validity of Solution

Scenarios showing how the intervention performs compared to other methods & implications for future urban renewal
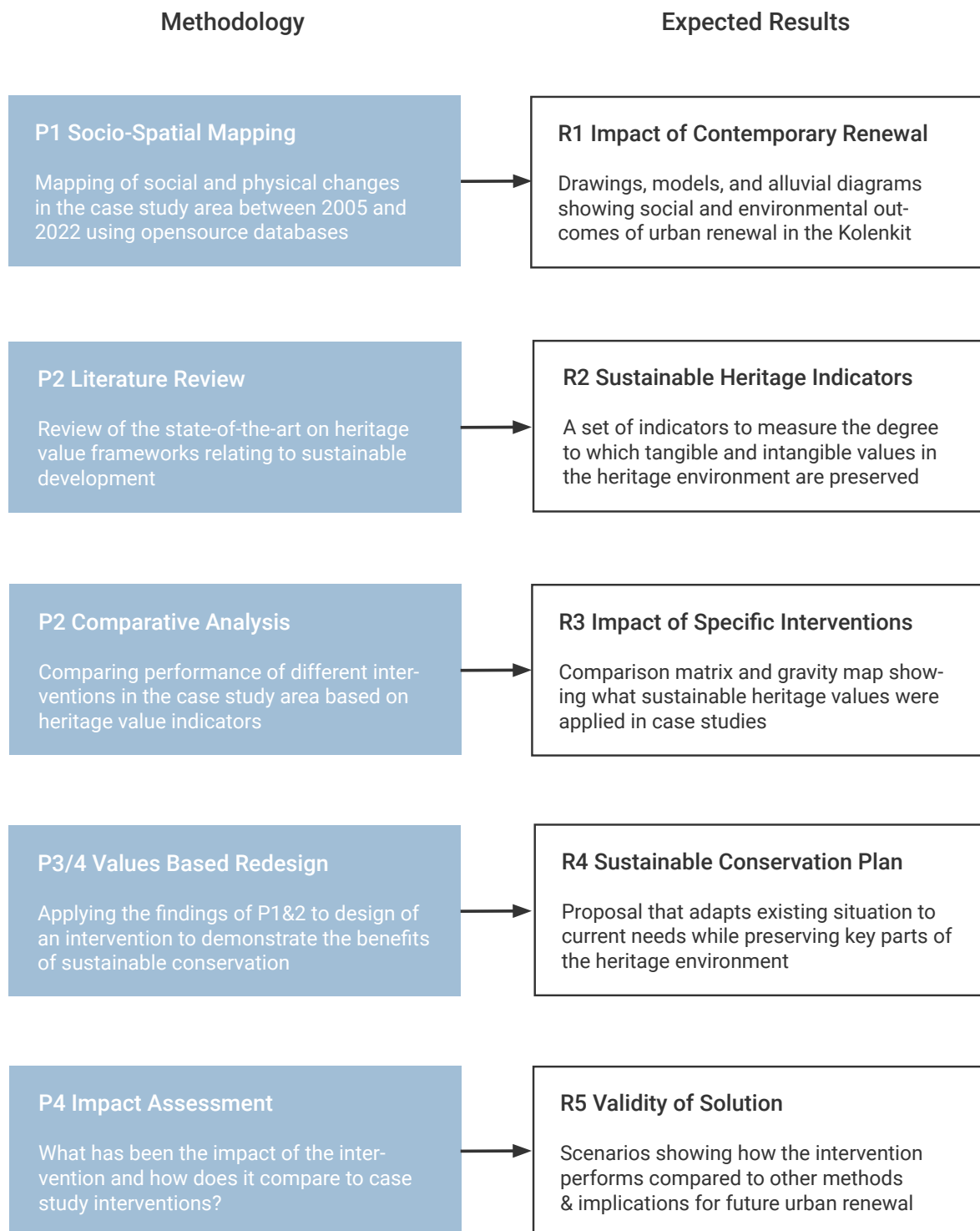
Figure 2.3, research methods and expected results.

Erasmusgracht and was only developed in the last 10 years, and ED04 is separated by the A10 highway and contains a lot of pre-war housing more similar in character to Amsterdam West, than Nieuw-West.

For the building case studies, it is helpful to use a larger sample size and a wide range of indicators to make generalisations about the overall urban renewal process. To achieve this in the scope of this research, it will rely mainly on quantitative methods. This limits the available data on intangible heritage values which would benefit more from qualitative methods like surveys or interviews.

2.4 Expected Results

The literature will help produce a set of indicators to measure the social and environmental impact of renewal interventions on the heritage environment. The socio-spatial mapping will result in drawings and models, showing spatial changes in the case study area between 2005 and 2023, and alluvial diagrams, showing changes and flows resources including number and tenure of dwellings, the size of units and use of building materials. This will be compared against social outcomes, such as neighbourhood and dwelling appraisal scores, percentages of overcrowded dwellings, and availability of social housing. Essentially, what is the environmental cost & how did it achieve social outcomes.
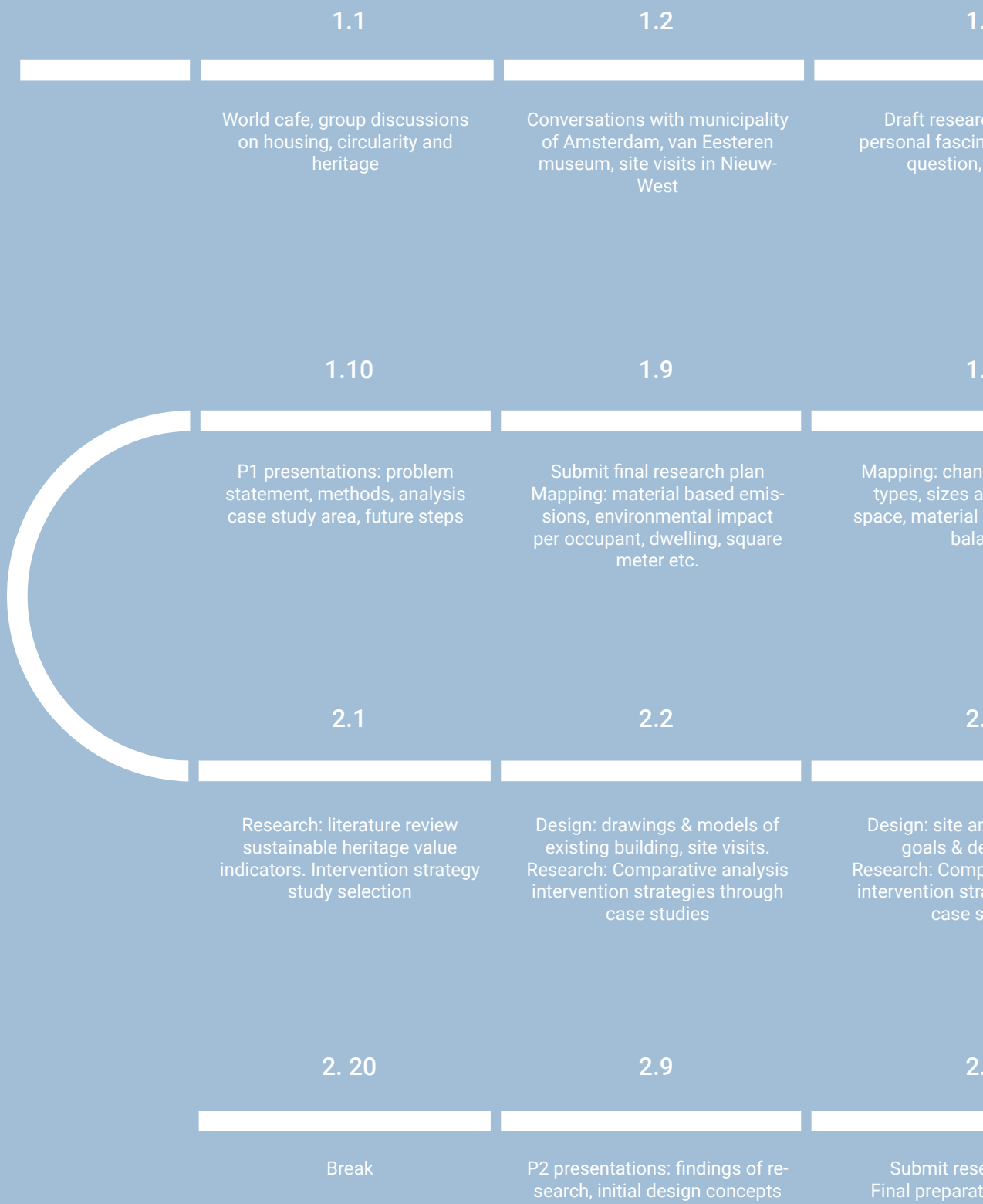
The comparative analysis will result in matrix comparing case study buildings based on social and environmental indicators created in the literature review. This could then be used to create a gravity map showing which values are represented most in the redesign of heritage buildings, and which need more consideration.
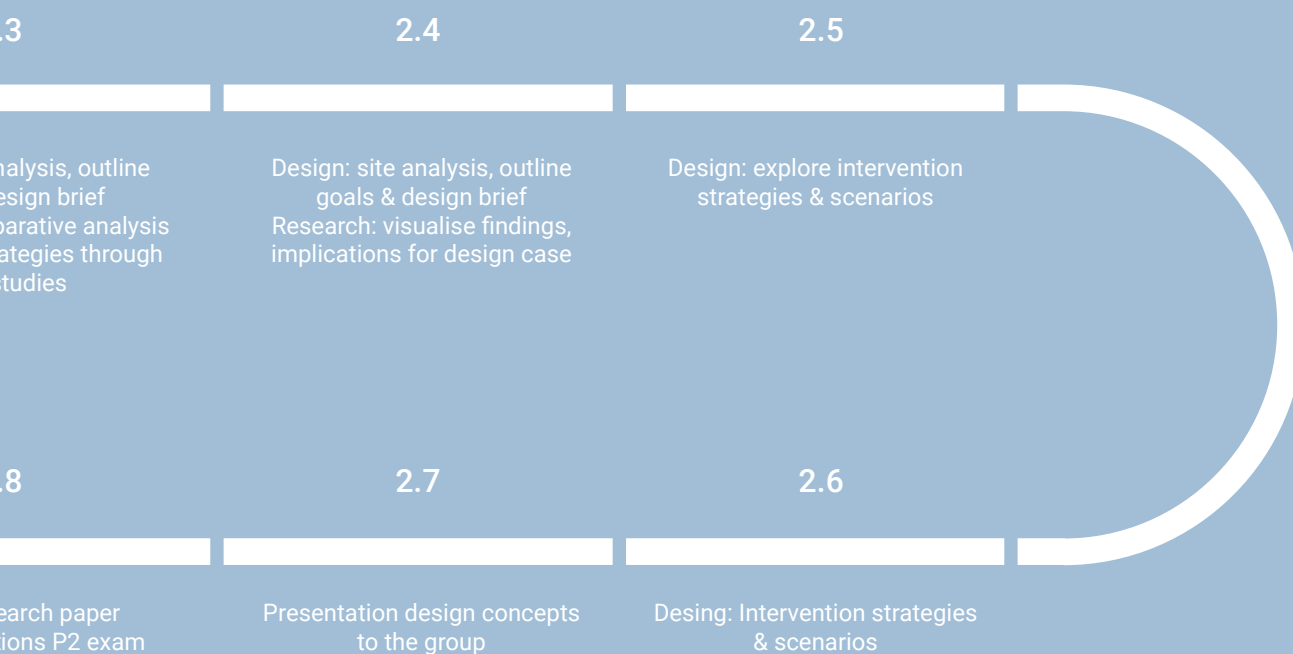
2.5 Relevance

Relevance to the studio: The topic of the studio is 20th century heritage and resourceful housing. This research is interested in how neighbourhoods change and aims to understand how both tangible and intangible resources are used or disused, and will try to relate this to heritage values, and social and environmental impacts.

Social relevance: Nieuw-West contains many dwellings that are in dire need of upgrading, and there is an overall need for densification. This research will contribute to a better understanding of how this challenge can be approached in a more sustainable way, and could help implement some of the ambitious circularity goals of the 2050 environmental vision and establish a clearer relationship between sustainable development and heritage preservation.

Time Line

1.1
World cafe, group discussions on housing, circularity and heritage

1.2
Conversations with municipality of Amsterdam, van Eesteren museum, site visits in Nieuw-West

1.
Draft resear personal fascin question,

1.10
P1 presentations: problem statement, methods, analysis case study area, future steps

1.9
Submit final research plan Mapping: material based emissions, environmental impact per occupant, dwelling, square meter etc.

1.
Mapping: chan types, sizes a space, material bala

2.1
Research: literature review sustainable heritage value indicators. Intervention strategy study selection

2.2
Design: drawings & models of existing building, site visits. Research: Comparative analysis intervention strategies through case studies

2.
Design: site ar goals & de Research: Comp intervention stra case s

2. 20
Break

2.9
P2 presentations: findings of research, initial design concepts

2.
Submit rese Final preparat

1.3

ch proposal:
nation, research
methods

1.4

Literature review: heritage,
sustainable development and
gentrification. Finding a case
study area

1.5

Workshop LCA simulation
Collecting maps and plans of
case study area & buildings

8

ges in dwelling
nd built floor-
flows and mass
nce

1.7

Submit full draft research plan:
problem statement, methods,
expected results. Peer review
RP colleagues

1.6

Mapping socio-spatial changes
in case study area: renewal,
tenure, livability indicators. Ex-
ploring availability of statistical,
GIS, and archival data

3

nalysis, outline
esign brief
parative analysis
ategies through
tudies

2.4

Design: site analysis, outline
goals & design brief
Research: visualise findings,
implications for design case

2.5

Design: explore intervention
strategies & scenarios

8

earch paper
ions P2 exam

2.7

Presentation design concepts
to the group

2.6

Desing: Intervention strategies
& scenarios

3 Case Study Area

The Kolenkitbuurt in Amsterdam West was chosen as a case study of contemporary urban renewal and regeneration practices of Dutch post-war housing neighbourhoods. It has historically had a particularly poor reputation, and as such it has recently undergone extensive efforts at improving the socio-economic conditions and 'liveability'. It was built right after the Second World War as part of the general expansion plan made by Cornelis van Eesteren, according to the garden city principles proposed by Ebenezer Howard. It consisted of rows of 4-story tenement blocks with mainly social rental apartments of under 60m2, many of them hosting large immigrant families (Miazzo & Kee, 2014). After 50 years, it started to fall into decay: in 2004 it was declared the least popular neighbourhood of Amsterdam and in 2007 it was selected as part of a national program aimed at preventing 'ghettoization' and improving the physical, social and economic conditions (Miazzo & Kee, 2014). Over the next 15 years, large portions of the original neighbourhood were demolished, new owner-occupied housing was constructed, and public spaces were reorganised. Some areas were heavily densified, while others kept with the overall structure. The renewal saw several distinct phases in which variety of approaches were employed: from demolition and new construction to renovation and even reconstruction of existing dwellings.

However, despite these extensive renewal efforts, it is not clear whether the conditions in the neighbourhood have significantly improved. Particularly the northern area, seems to have deteriorated further in some regards and internal inequality has only increased. Based on analysis of data from the O&S (onderzoek & statistiek) Amsterdam, it was found that the neighbourhood appraisal score, despite a marginal absolute increase, fell in relative terms from the bottom 5th percentile, to bottom 1st percentile rank compared to other neighbourhoods in Amsterdam. Meanwhile, issues like poor energy performance, overcrowding and high unemployment persist (Gemeente Amsterdam, 2023). This raises serious questions, both about the effectiveness of this approach to renewal, and about the environmental impact of the interventions have had. This case study will examine those two questions side by side to see what has been achieved, and at what cost.

Figure 3.1, areal photograph of the Kolenkitbuurt, Stadsarchief Amsterdam, June 17th 1983.

Figure 3.2, areal photograph of the Kolenkitbuurt, Stadsarchief Amsterdam, Juli 9th 1957.

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