# Progress through Heritage: Integrating Adaptability in the design process of outer dike Industrial Riverine site transformation

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## Introduction & Problem statement

Since the start of the first Industrial Revolution, the River deltas played a significant role in the economic formation of port cities like London, Rotterdam, and Hamburg. This relation between riverine industries[1] and big ports was tightly connected in the 19th century and until the late 20th century, dwindling with the development of maritime engineering and shipping needs of a globalized world in the late 20th century (den Boer, A. 2020). The Riverlands, once housing various steelworks, industrial plants, and other supporting facilities, began to lose their economic value because of geographical constraints (shallow water, expensive labor force). This therefore led to the river industries losing the link to big ports, consequently creating a period of economic uncertainties. Companies like Nedstaal, Kloos, Oude Werf. were either closed or bought off by other companies. Neglection and decay would tower over most of these plants.

In the 20th century, Dutch industrial halls represented a whole amplitude of feelings for the settlements around them[2]. In the case of Alblasserwaardt, the sentiment towards industries transcended into multiple attitudes, them being seen first a source of income, followed by a negative attitude after the factories migrated to cheaper countries and finally, culminating in a sentiment of nostalgia and pride for the older times and accomplishments[2]. In the case of Sliedrecht, the dredging industry molded the inhabitants' identity, household culture and belief, every family having at least one member that employed in dredging[2]. The same occurrence is discussed in Ivan Nevzgodin's paper on adaptive reuse of industrial architecture (2016).

When it comes to riverine industry, one of the main development factors was water management, industries being normally located in the outer-dike landscape. Besides the fact that water represented a geographical opportunity (efficient transport of goods), it was still the main threat for industry because of potential floods. With the rising sea levels and threat to the Dutch delta regions[3], outer-dike industrial zones experience an elevated risk of flooding and deterioration (KNMI, 2014). Therefore, it

1. Riverine heritage - (definition) Industrial heritage that interacted and was positioned on a river.
2. Taken from the discussion with Kees Wim and other members of the Sliedrecht visit on September 8th 2023
3. Sea Level: Dutch Coast and Worldwide, 1890-2014 | Environmental Data Compendium, n.d.)

is pivotal to adopt an architectural transformation strategy conscious towards the flood risk. This research will delve into the design strategy that tends to the possibility of repurposing the industrial building into another function and notably residential. The reason for this function adaptation is based on two reasons: housing shortage and need to reuse. The decades-old housing shortage, together with the need to reuse the current building stock (Meurs, 2021) show a practical option to link both problems and generate a suitable solution. The book River Space Design by Martin Prominski describes multiple design opportunities when it comes to an environmentally friendly and sustainable integration of housing in riverine environment (Prominski et al., 2012). Additionally, Han Meyer underpins the importance of thinking towards mitigation, adaptation and uncertainty when it comes to landscape transformation (Meyer, H. 2020).

While undertaking a literature review using the keywords Dutch River Heritage, abundant information was found regarding such topics as: waterfront heritage revitalization; Port cities transformation and coastal heritage. However, little to no information is present regarding riverine industrial heritage and the importance of rivers on a smaller scale (the relation between the river and local industry or settlement).

In this research, riverine heritage is defined as architectural industrial heritage located on the river shore, which interacted with it as a transport medium or connection to other riverine industrial shores.

It is important to underline the meaning of heritage, this will however be more developed in the methodology section.

For this research, the position of an architect is taken that would provide a design guideline for riverine heritage transformation with regards to adaptability. Given that the potential new function is located in the outer-dike zone, adaptability to disaster and new ways of living in case of flooding becomes fundamental. Therefore, the research will focus on tackling the problems and adopts the subsequent question:

***How can architects integrate Adaptability in the transformation process of Dutch outer dike industrial riverine heritage for housing development?***

With the following sub questions:

1. What challenges are posed when designing housing in outer dike regions?
2. What is the current state of affairs regarding outer-dike industrial heritage?
3. How is the perception of water influencing riverine architecture?
4. What functions can be interconnected with residential in outer dike zones to enhance project adaptability?

# Methodology

Three fields of focus can be distinguished for this research: Industrial Heritage value assessment, Perception of water and Adaptable riverine residential architecture. For these subsequent topics, different kinds of sources and data collection methods are needed.

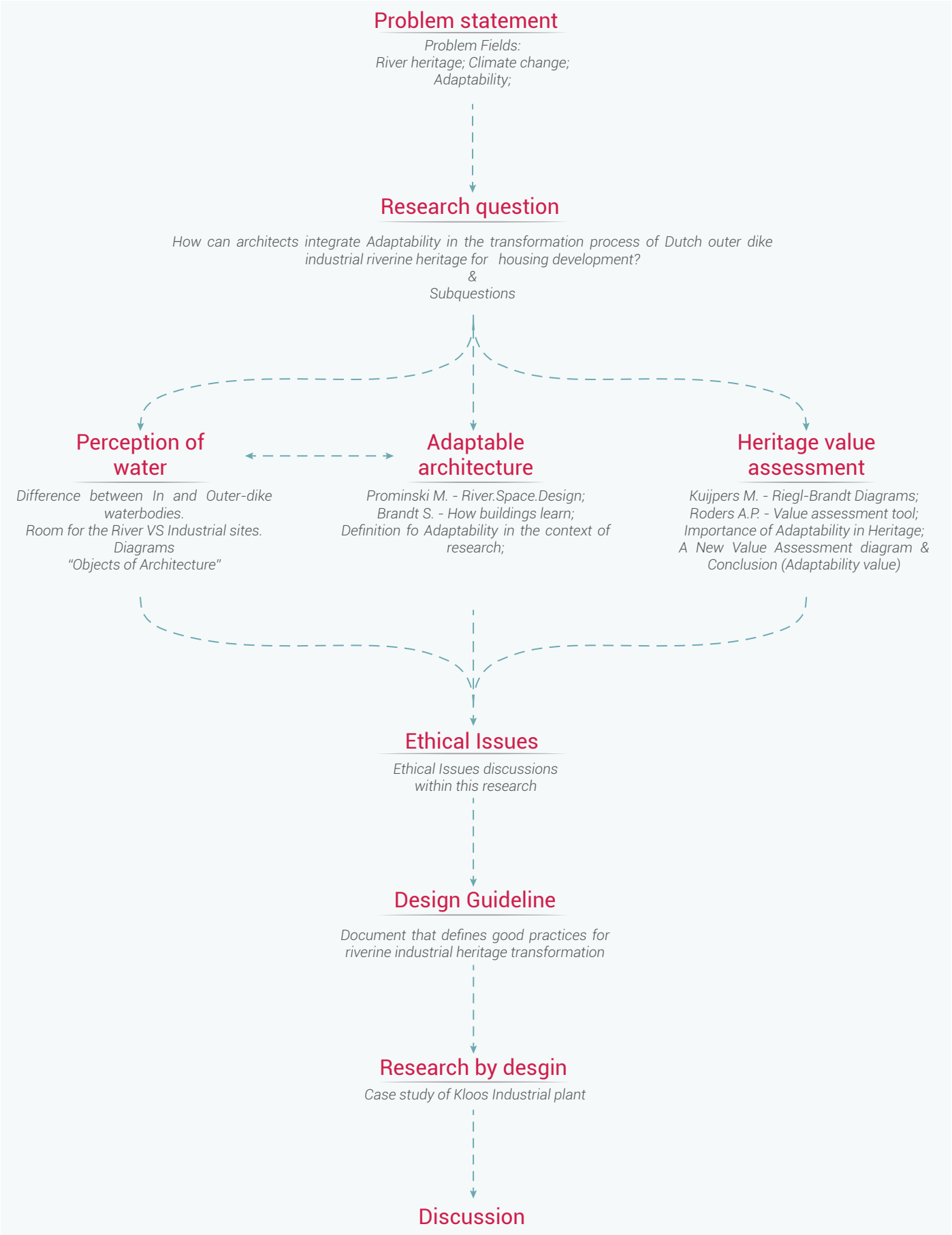


fig. 1 Research Plan Diagram

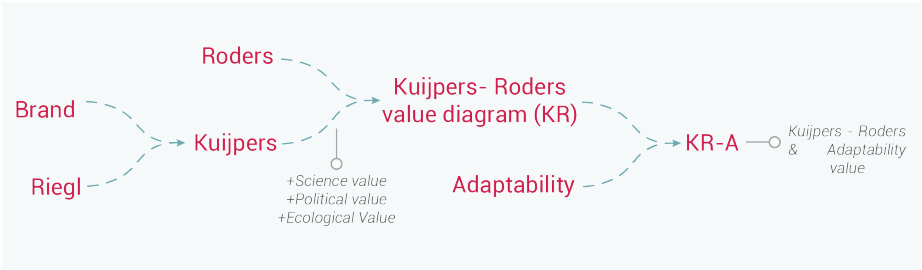


fig.2 Heritage Value Assessment process diagram

## Heritage Value Assessment

Regarding Industrial heritage value assessment, a definition of industrial heritage is introduced, followed by an explanation of the current state of affairs in heritage value assessment. Subsequently we will investigate the reason some industrial complexes/ buildings were turned into heritage sites and how this could influence other industrial sites.

In terms of heritage value assessment, several tools and methods can be shortlisted, notably: Brandt (1994), Riegl (1982) Pereira Roders (2020) and Kuijpers (2017). Kuijpers & De Jonge are combining the first two value assessment methods by creating a Riegl-Brandt diagram. In this diagram, some values are not considered, such as the political, ecological, and scientific values present in Roders' theoretical framework. Thus, a new matrix is proposed that would consist of Brandt's seven layers and Roders' Values that are missing in the framework of Alois Riegl.

Moreover, as this research investigates outer-dike industrial halls, a new value is proposed, notably adaptability value, thus creating a new matrix combined of the work of Pereira Roders, Brand, and the addition of adaptability value of the industrial site (fig.2). This value will be described shortly in the next paragraph.

## Adaptability

There are multiple definitions for the term "Adaptability; Robert Schmidt III (n.d.) Defines Adaptability as "Adaptability as a design characteristic embodies spatial, structural, and service strategies which allow the physical artefact a level of malleability in response to changing operational parameters over time." while Han Meyer (2020) defines it as "adjusting our planning and consumption to the already irreversible effects of climate change, like accelerating sea-level rise" - a definition befitting a research in urban deltas. Nevertheless, it does not do justice to our topic. It becomes obvious that a definition of the term tailored for our research is required, precisely explaining the potential of adaptability in riverine architecture. An important note about this section is that the possibility of developing a residential function will be analyzed.

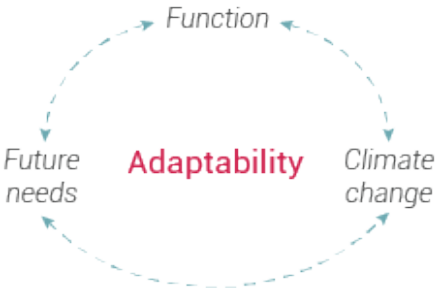


fig.3 Adaptability factors

Therefore, the definition of Adaptability in the current research is "The ability of a design to respond to challenges

associated with riverine and/ or outer-dike industrial locations, such as flooding, climate change and future needs " (fig. 3).

The analysis will subsequently be supported by a series of literature about Architectural reuse by Paul Meurs (2021), Ideas of Adaptability from Han Meyer (2016, 2020), Carola Hein (2020).

### Water Perception

In the case of Water perception, research focuses on answering the question "How is the perception of water influencing the architecture along the river? "Throughout history humans have been trying to tame the water by digging canals, straightening the shoreline, and dredging its bed. This led to the genesis of different objects of architecture thus, a diagram is created to highlight these objects and their perception. Therefore, water is divided into two entities: Water inside and outside the dike. Theory and methods for classification and filtering of the objects will come from the book River.Space.Design by Prominski (2012), Room for the River, Natura 2000, and the analysis of River perception


fig.4 Water perception Diagram by de Buijs (n.d.)

## Ethical Assessment

Given the multitude of industrial typologies located on the Dutch river deltas, it is imperative to consider some ethical issues and considerations.

Heritage & Value Assessment: Preservation vs Development; Restauration,

Perception of Water: Environmental preservation and Impact; Negative vs Positive.

Adaptable riverine architecture: Public vs Private; Single vs Collective ownership.

It is chosen to delve into the ethical issues present in the adaptable riverine architecture, the reason being the polyvalence of this matter for different domains, not only architectural heritage transformation but also housing shortage, climate change and The outcome of the ethical issue assessment together with the focus field research will represent a set of

design and conceptual guidelines that should be taken into account when designing riverine industrial heritage transformation projects. A case study will be introduced with the goal of evaluating the Guideline mentioned above. For this, the Kloos Industrial area is chosen.

## Timeline

Ideally, the research should take no more than two quartiles (excluding the research plan creation), starting from November 13th and ending on April 21st. Most of the research will be planned in the first quartile, kick starting with the heritage value analysis and generation of a reliable theoretical framework. In the first week of 2024, research on Adaptable strategies should start and end in the second week, followed by the analysis on water perception (fig.5).

Thus, in the second half, the main focus of the research will be the creation of the design guidelines and their subsequent application in the proposed case study. It is possible that the work on the case study will start earlier, however this will not undermine the focus of the research. Discussion and reflection will be started in March. Formating and final reviews will be left for the last three weeks in order to ensure a good outcome of the research.


fig.5 Research Timeline

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