



Research Plan | Wood Studio

Personal Information

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Title: Reconstructing **Symbiosis Network** for
Amphibious Community under the floating scenario

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- Amphibious architecture
- Symbiosis system
- Regenerative design
- Landscape-based architecture

Problem Statement

Shifting relation between WATER and HUMAN

The Amsterdam waterbody is a living palimpsest. Shifting relation between WATER and HUMAN with ARCHITECTURE as intermediary has been witnessed throughout history. In most vernacular cases, water acts as the heart of the living habitat for transportation and social activities. "Amphibious culture" was described as a system of interconnected elements allowing the village to grow in symbiosis with natural and social dynamics. (Casimiro, 2023)

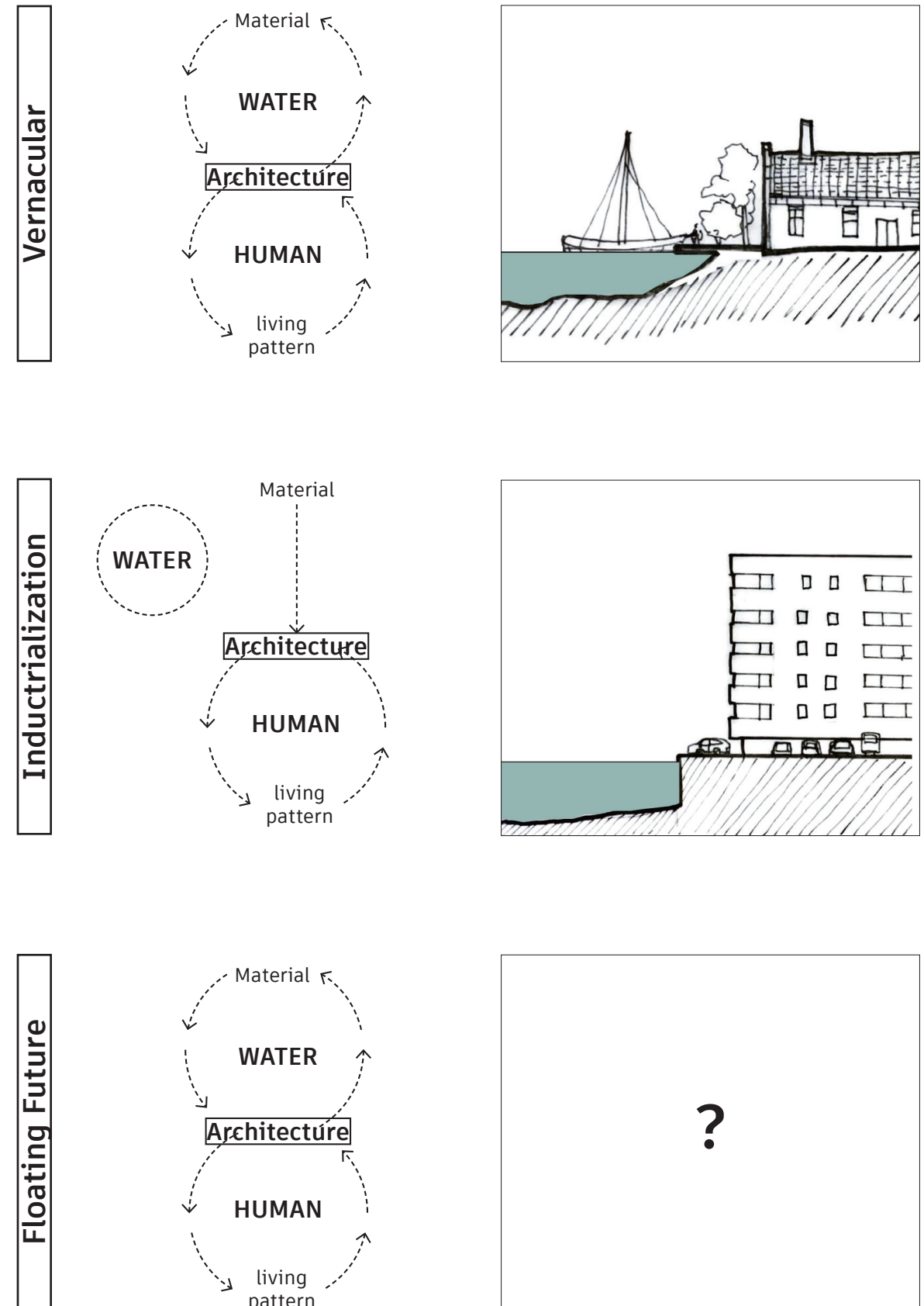
However, following WWII, deindustrialization altered this balance, weakening the connection between social and natural system. Water is no longer the heart of the city with amphibious culture shifting to land culture. Water became backyard of the construction. The shifting relation between social and natural networks also implies the weakening relation between architecture and local material value chain.

Shifting Material Value Chain

Many historic vernacular architectures relied on locally extracted bio-based material (Dall, A, et al.2024), however, this culture was also reshaped due the industrialization relying on transnational supply chains. As highlighted in "*Copenhagen lesson*", when sourcing materials for construction, local renewable materials come first. Shifting architecture towards a post-carbon future implies bio-based materials extraction and locally driven value chain for resources.

Floating Scenario WHAT_IF: Netherland 2100

The KNMI Climate Scenarios show that, by 2100, the sea level in the Netherlands could be more than a metre higher than it is now. (Ministerie van Infrastructuur en Waterstaat, 2023) Under such floating scenarios, low-lying western parts of the Netherlands, including Amsterdam, would no longer be protected from the sea. This projected scenario raises urgent questions: How will the relationship between humans and water evolve under these conditions? And how might architecture adapt as an intermediary, fostering a sustainable material value chain that supports symbiosis between people, water, and the built environment?



Problem Statement

Challenges under floating scenario

HUMAN

Infrastructure would be reshaped under such a scenario. Self-sufficient amphibious community would be needed to tackle energy, food shortage as well as housing issues.

WATER

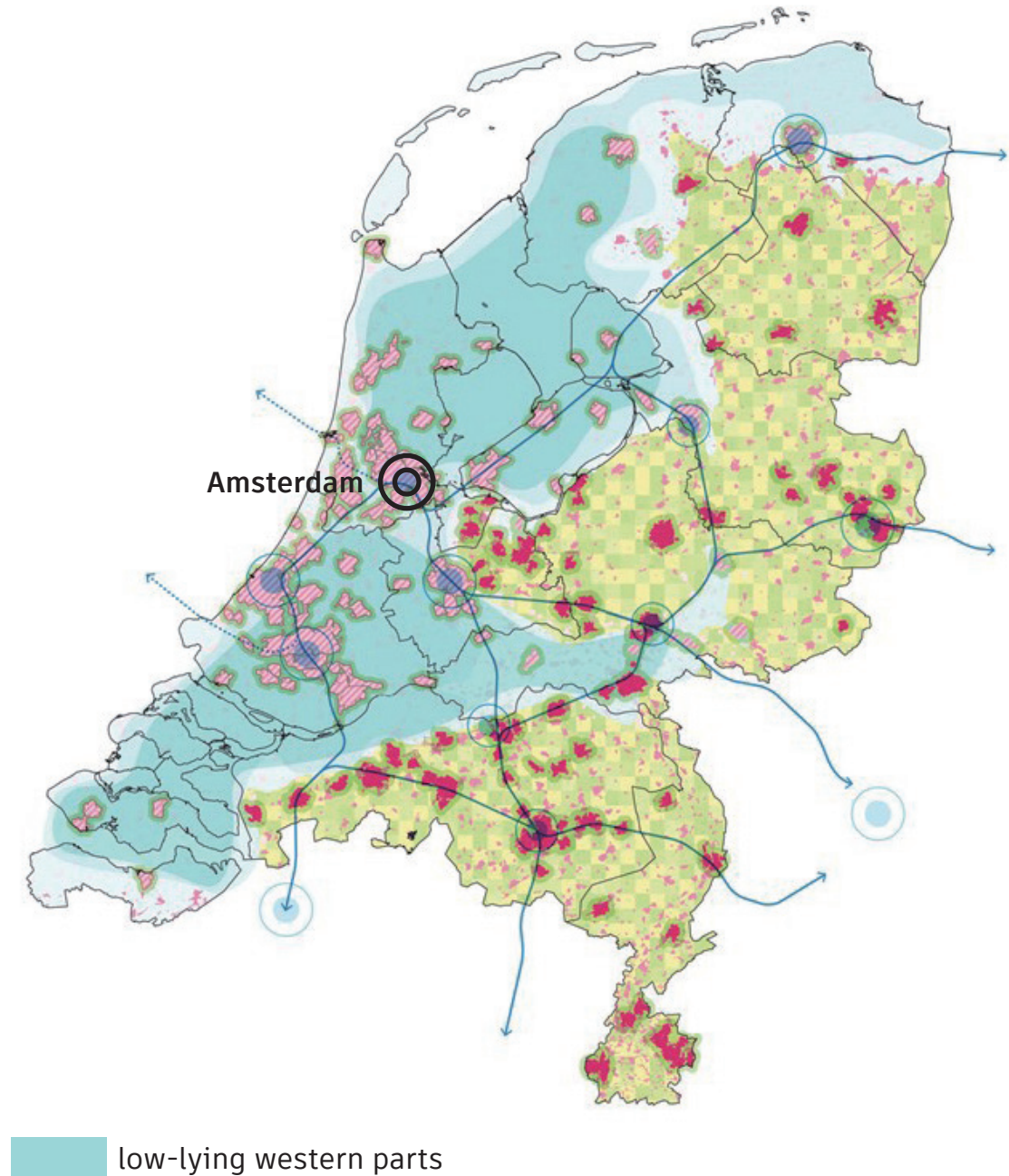
Under this floating scenario, water would be again brought to the context of the city. Stormwater overflow would largely challenge the water quality and the amphibious eco- system. Reconstruction of wetland system would function as a natural filter. (Dordio et al., 2008)

ARCHITECTURE

Architecture would be on one hand reshape due to the human activities relying on water and on the other hand, limited to available material, which could be harvested regionally and transported through water.

Lessons could be drawn from vernacular cases of how material is harvested at a regional level and transported through water leading to a certain construction framework. In those cases, social and natural layers are interconnected, encouraging a symbiosis and regenerative mode of development at community scale. How can we translate those mutually-benefit symbiosis systems into the floating urban context by abstracting certain design principles? And how landscape-based material enhance symbiosis living in amphibious community under a floating scenario with the implimentation of those design principles?

Research Focus



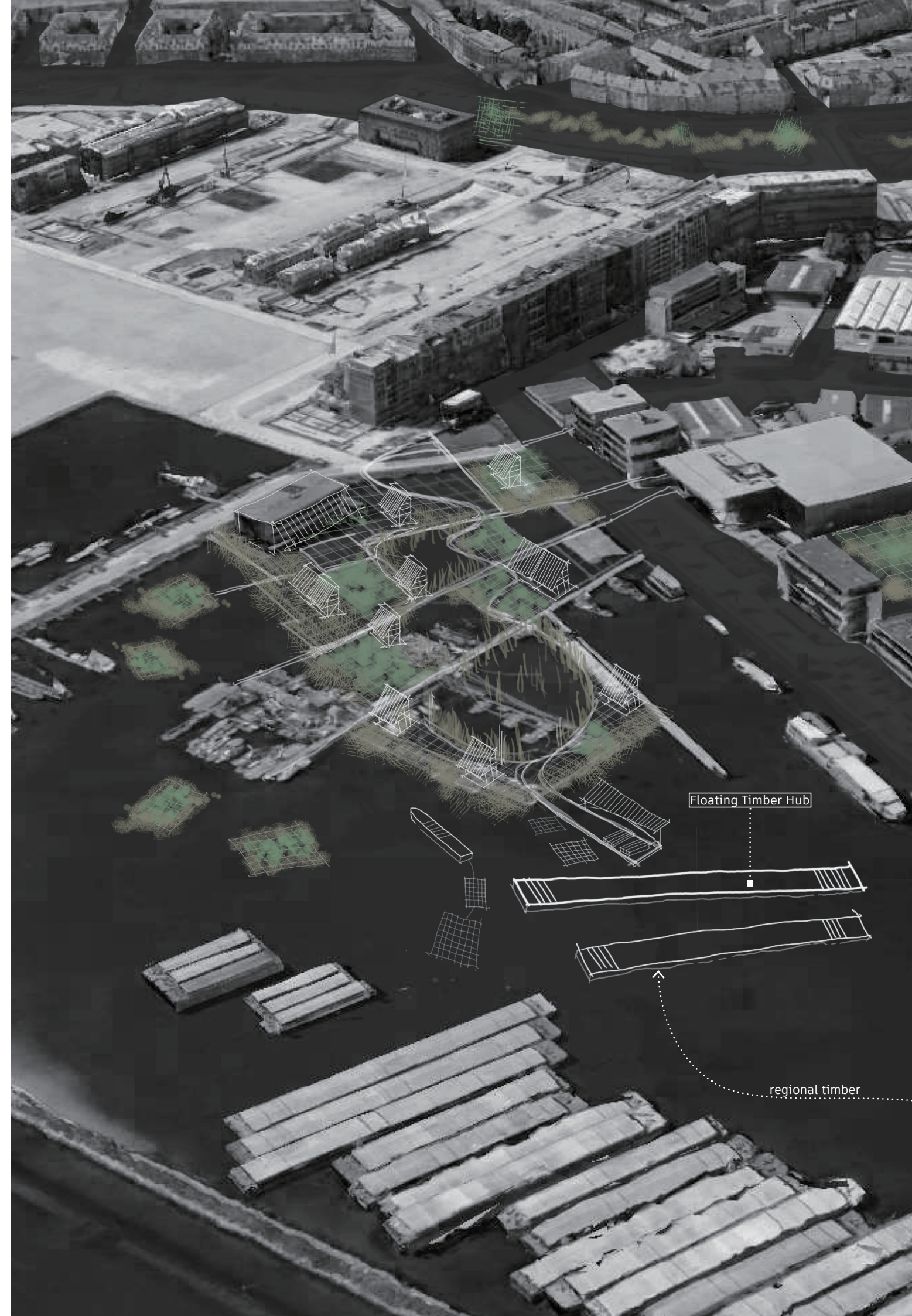
Objective

The design objective of the graduation project is to develop a methodology for symbiosis living with water within a flood-prone urban context. The vision centres on creating an interconnected network that integrates wetland landscape and self-sufficient human living. This will be approached by focusing on a detailed study of the Amsterdam Houthaven area towards the floating scenario in 2100, with an attempt to reimagine the self-sufficient living system and the locally harvested value chain for construction material under such extreme situations.

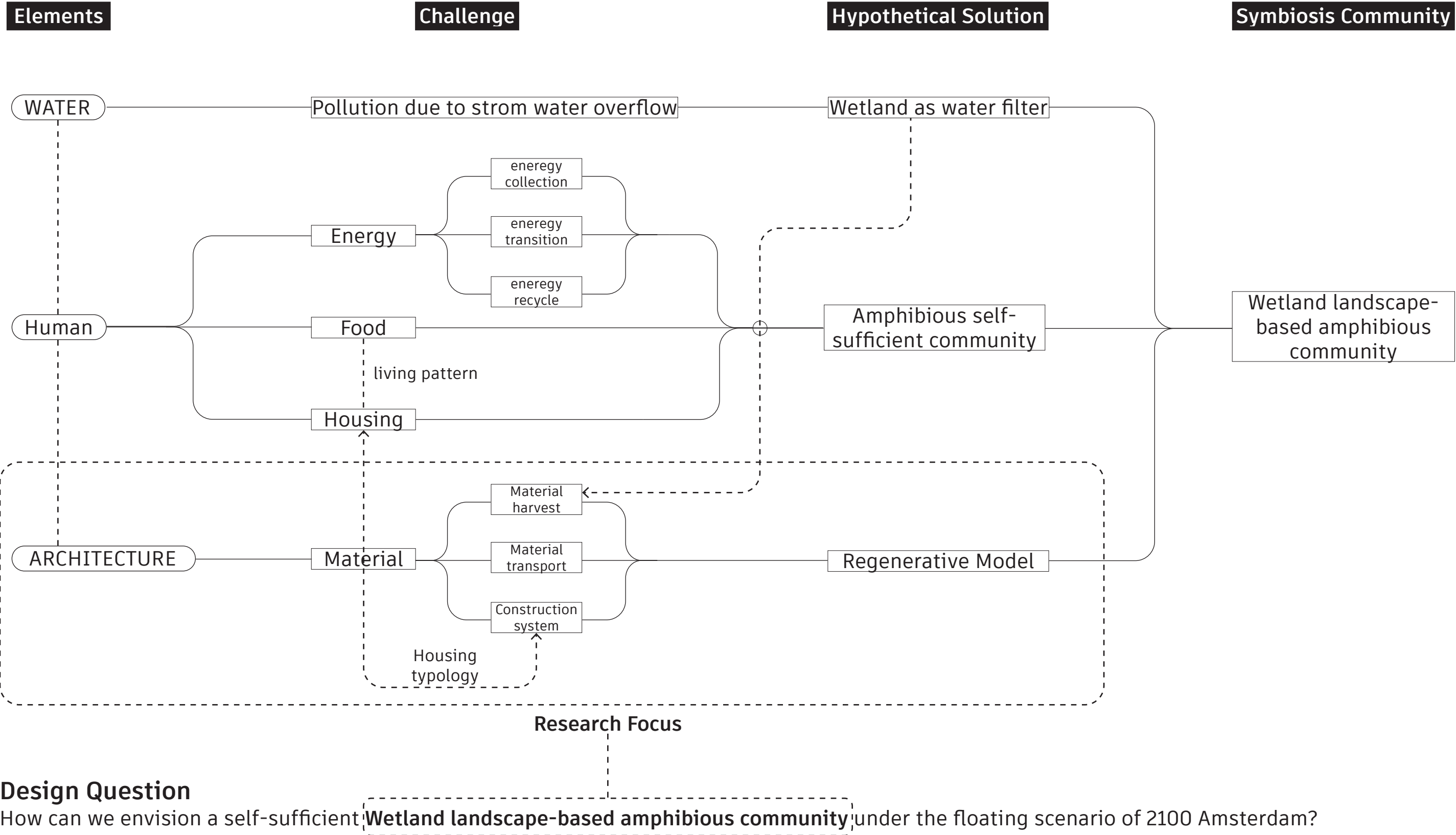
The research aims to adapt vernacular knowledge of using local, landscape-based construction materials for future scenarios that incorporate wetland-based resources, ultimately developing an optimal construction system. This study will serve as a foundation for deeply understanding the potential of these materials in a symbiotic living model. The first part of the research uses a case study methodology, examining traditional amphibious structures to understand how materials are harvested, transported, and used in construction systems. From these analyses, design principles will be drawn to guide the use of wetland-based materials in a future urban context.

The second part involves prototyping. By applying the derived design principles to the local context with available materials and their physical characteristics, this phase aims to adapt and refine these principles under a regenerative model. The goal is to explore construction systems that can effectively support symbiotic living in a floating scenario.

The design goal is to envision innovative applications of landscape-based materials—such as timber, reeds, and hemp—as sustainable construction materials that support a vibrant, floating lifestyle by 2100.



Overall design question



Thematic Research Question

How **wetland landscape-based material** enhance **symbiosis** living in **amphibious community** under a floating scenario?

Research Hypothesis

By analyzing the local material value chain and understanding the properties of wetland-based materials, it will be possible to develop **design guidelines** and **construction systems** within the framework of **regenerative model** meeting the needs of a self-sufficient floating community.

Sub-questions:

What is the value chain of locally sourced wetland materials, from harvesting and processing to construction?

What construction techniques and structural systems are most effective for using wetland-based materials in a floating context?

- Structural stability
- Adaptation to Water Dynamics
- Compatibility of Materials

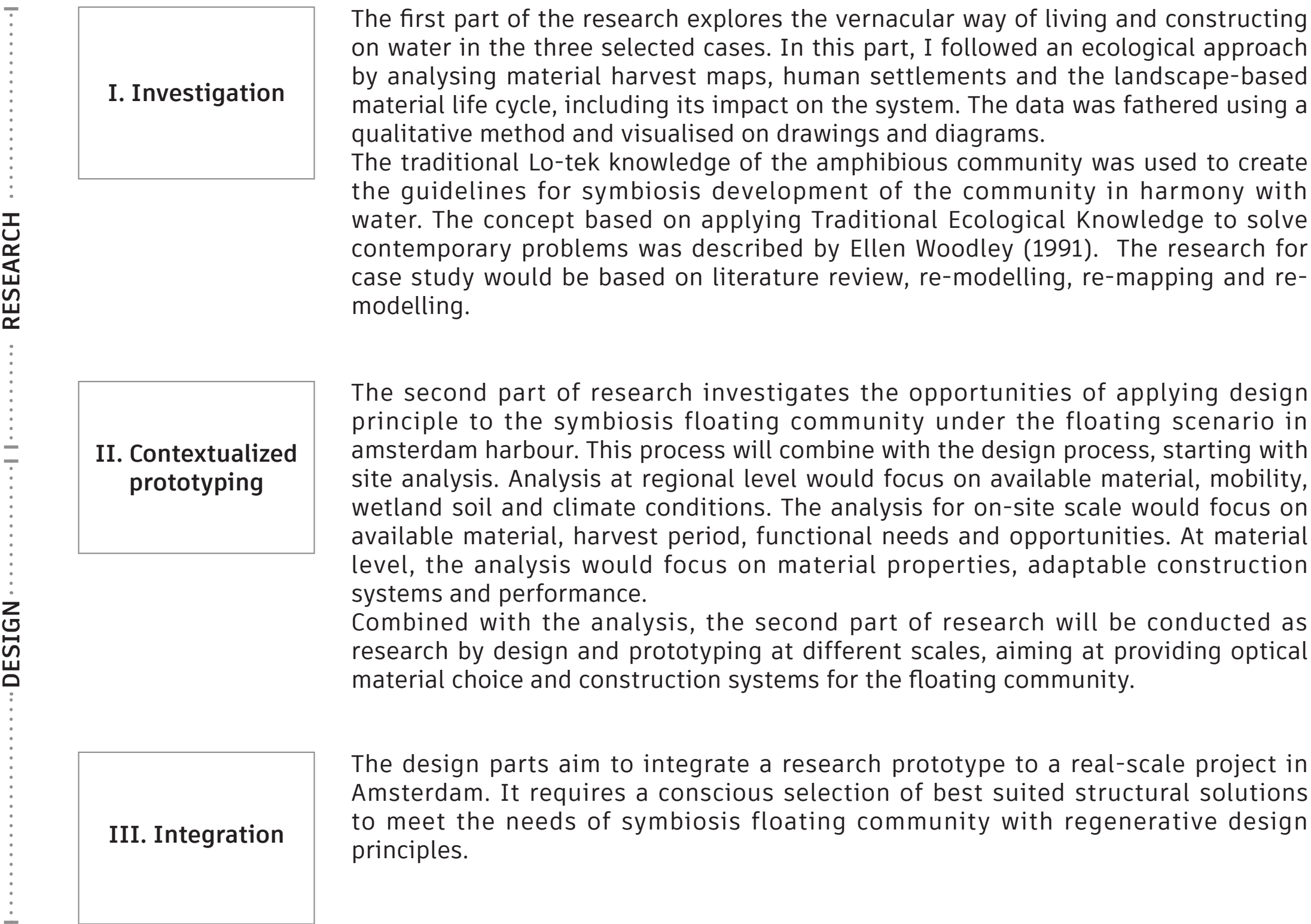
What architectural or design principles can enhance adaptation of local-material based component to symbiosis living?

- Disassembly
- Modularity
- Ecological integration



Floating school on a Nigerian lagoon by architecture studio NLÉ

Research Methodologies



RESEARCH METHODS

Case studies research:

- re-drawing
- re-modelling
- re-mapping
- literature review

Research by design

Prototyping

Site investigation

Design research

- site and concept specific concept development

Research Structure

Part I | Investigation

Community Scale
Module for symbiosis circle



Floating fishery village, China



Giethroon village, Netherland



Totoro reed floating island, Peru

KEY MATERIAL

Material Harvest

Material Transport

Construction framework

HOUSING TYPOLOGY

Structural framework

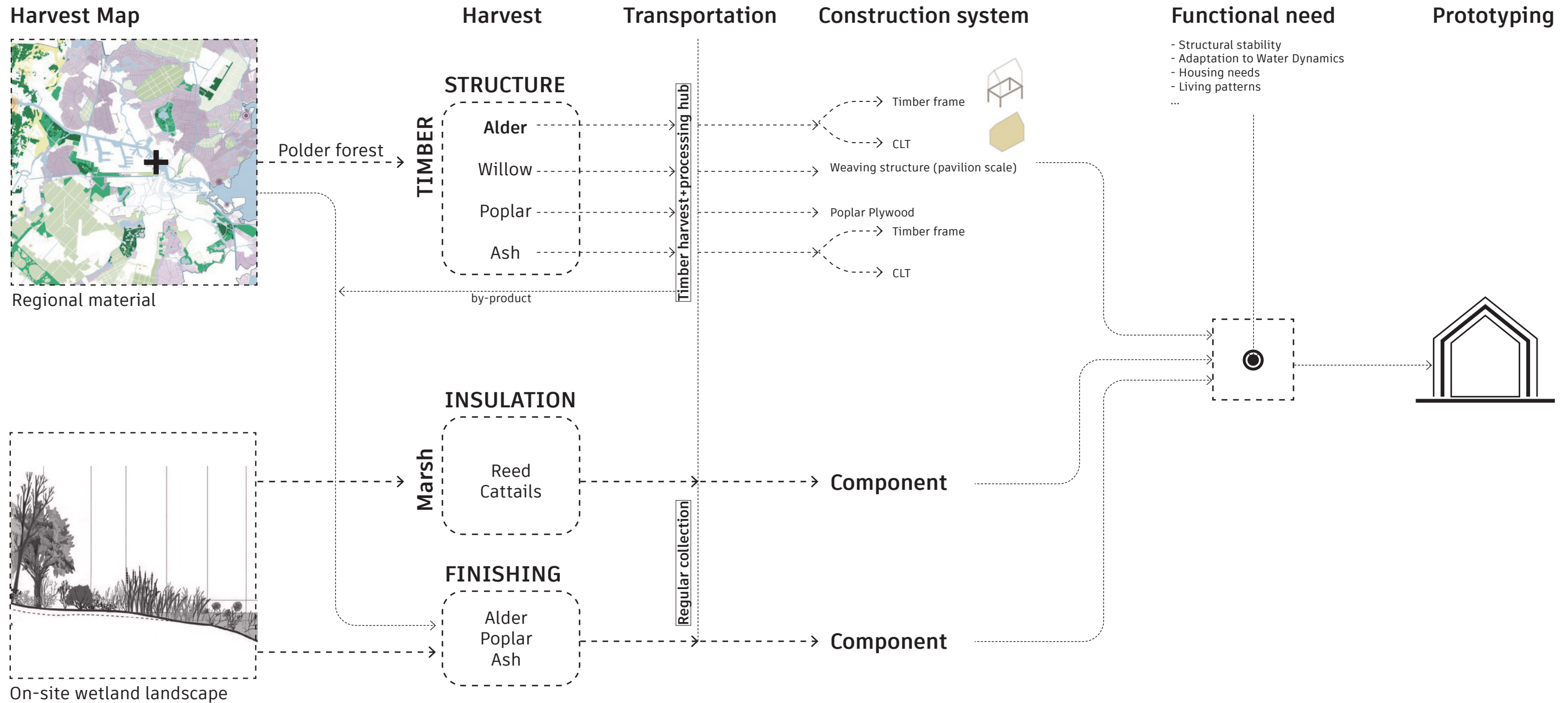
Functional organization

Part I | Investigation

This part aims to examine how materials are harvested, transported, constructed and how they shape the housing typologies in the three selected vernacular cases. By analyzing these cases, design principles that enhance symbiotic living would be extracted.

Research Structure

Part II | Contextualized prototyping



Part II | Contextualized prototyping

The second part of research investigate the opprtunities of applying design principle to the symbiosis floating community under the floating scenario in amsterdam harbour. Combining with the site analysis, the second part of research will be conducted as research by design and prototyping at different scale, aiming at providing optical material choice and construction system for the floating community.

Research Structure



Research

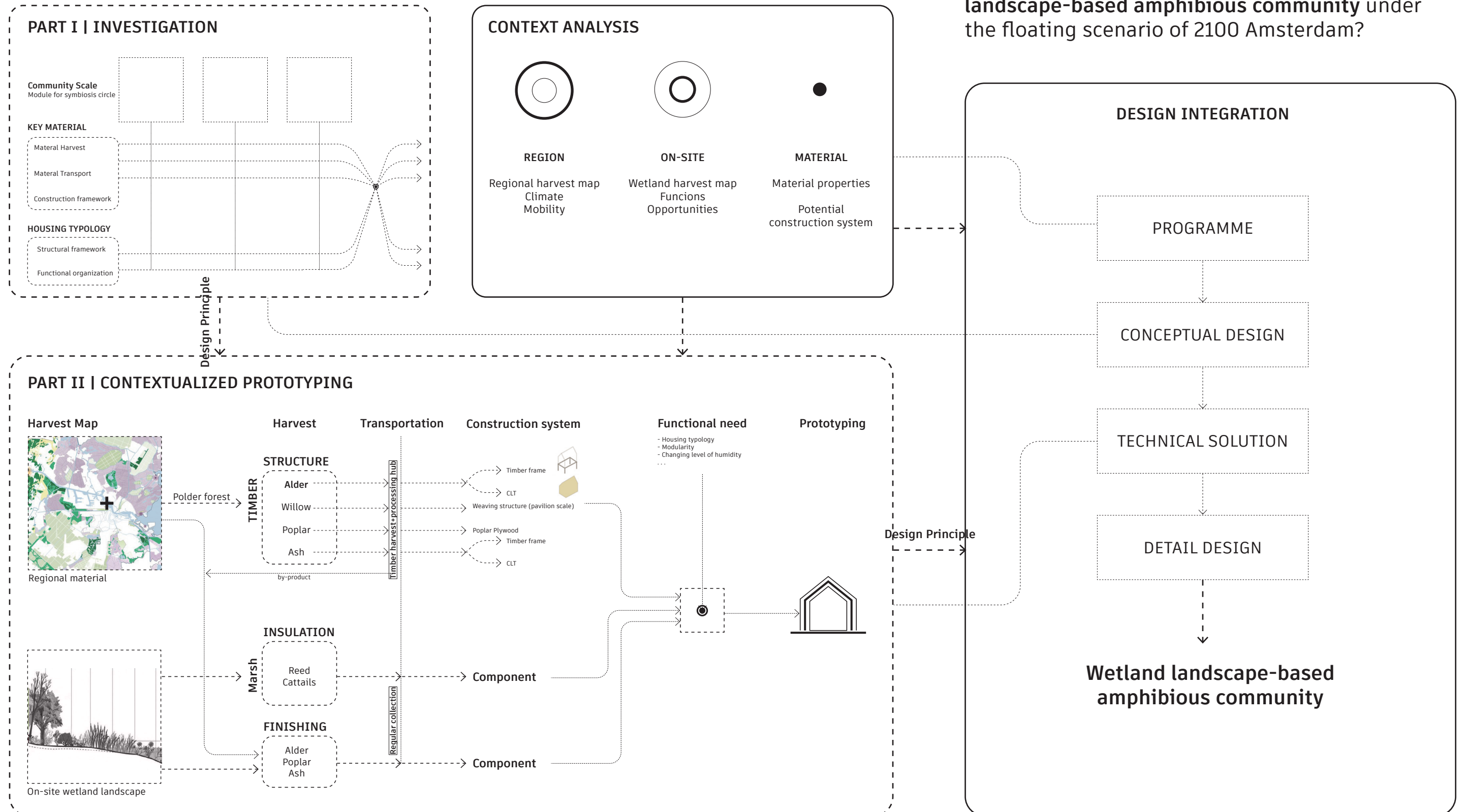


Design

Research Question: How wetland landscape-based material enhance symbiosis living in amphibious community under a floating scenario?

Design Question

How can we envision a self-sufficient **Wetland landscape-based amphibious community** under the floating scenario of 2100 Amsterdam?



Argument on Relevance

As climate change accelerates and sea levels rise, cities worldwide, particularly low-lying areas like the Netherlands, face significant risks of flooding and land loss. Amsterdam, surrounded by water and historically vulnerable to flooding, epitomises this challenge. Traditional urban infrastructure and modern building practices often fall short of adapting to increasingly amphibious environments, highlighting the urgent need for resilient, sustainable design solutions. The main value of the graduation project in the larger social and eco framework will come from an attempt to **re-centering water and nature in urban life through a model of symbiotic living**.

The focused research objective will critically evaluate the role of landscape-based material, especially timber, in demonstrating how locally sourced, renewable resources can support a self-sufficient community on water, lessening the environmental impact while addressing the realities of rising seas.

This approach has broader implications beyond the Netherlands: it offers a blueprint for cities worldwide to rethink urban planning, fostering ecosystems that benefit both nature and human inhabitants. At its core, this research promotes a shift toward coexisting with water—a necessity for resilient urban futures under climate change.

Glossary of Key Terms

Amphibious architecture

Floating and amphibious houses are built to be situated in a water body and are designed to adapt to rising and falling water levels due to river floods and storm surges. Amphibious houses are situated above the water and are designed to float when water levels rise.

Symbiosis system

A closed, prolonged association between 2 or more different element/parties, where parties involved benefit from the interaction.

Regenerative design

Regenerative design is an approach in which human and natural systems are designed to co-exist and co-evolve over time. The value of a regenerative design approach is in its potential to regenerate planetary health and deliver positive outcomes for both people and planet.

Landscape-based architecture

Landscape-based design is considered an important strategy that shapes the physical form of regions using the landscape as the basic condition. It is an transdisciplinary effort to safeguard sustainable and coherent development, to guide and shape changes which are brought about by socio-economic and environmental processes, and to establish local identity through tangible relationships to a region.

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