

Research Plan



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Architectural Engineering
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Q1 2024-2025 - 08.11.2024

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Studio

Name of studio: Architectural Engineering
Design tutor: Thomas Offermans
Research tutor: Pierre Jennen

Argumentations of Choice of the Studio

This year is the last time I can explore the question, 'What is architecture, and what should it be?' in such a free way before working within an existing system. This studio gives me the creative freedom to think about what the world should be and how architecture can contribute to that vision.

Keywords

Human-Nature Connection, Indigenous Wisdom, Ecological Design, Urban Environment, Participatory Design, Living Architecture

Glossary of Keywords

Human-Nature Connection

In Biophilia by Edward O. Wilson (1984), this connection refers to humanity's kinship with nature, where people have an intrinsic psychological need to interact with the natural world.

Indigenous Wisdom

Rooted in Braiding Sweetgrass by Robin Wall Kimmerer (2015), this is the understanding and practices passed down through generations that honor reciprocity, respect, and coexistence with the natural world, seeing humans as active participants in nurturing ecosystems.

Ecological Design

Kallipotti (2024) described ecological design as the seamless integration of human activities with natural processes in fields including architecture, industrial ecology, sustainable agriculture, and water treatment.

Urban Environment

Day & Gwilliam describe cities as hubs of human activity, where there exists a distance between inhabitants and the ecosystems that sustain them.

Participatory Design

In Habraken's work (2020), participatory design emphasizes the involvement of people in shaping their own built environment. Rather than passive users, individuals become active participants, with a sense of ownership and control over the spaces they inhabit.

Living Architecture

As described by Ludwig, living architecture are buildings as adaptive entities, responding to environmental and human influences over time. Rather than static structures, these buildings operate like organisms within their ecosystem.

Introduction

Disconnection between humans and nature in urban areas.

In the **urban environment**, there seems to be a growing disconnection between humans and the natural world. Cities, as hubs of human activity, have distanced their inhabitants from the **ecosystems** that sustain them (Day & Gwilliam, 2019), (Kimmerer, 2015), (Bloemink, 2021), (Rousseau, 1755). Young people are increasingly less able to recognize common birds, plants, and animals, and have limited knowledge of the systems behind their food, water, and waste (Persoon, 2024). For many, the animals or processes behind daily essentials remain unseen. Despite this disconnect, that external ecosystem remains crucial to survival, supplying food, materials, and resources. The natural world is increasingly viewed as greenery rather than as the foundation of all life, a perspective reinforced by the construction industry, which often labels buildings as sustainable based solely on the presence of natural elements, without addressing deeper ecological connections. Brazilian **indigenous** leader Ailton Krenak describes this gap between humanity and the ecosystems it depends on as a key factor in the gradual transformation into a “zombie” existence—individuals who perceive themselves as separate from the Earth, avoid responsibility, and focus solely on consumption (Bloemink, 2023). This belief in a separation between humans and nature is seen as a root cause of the ecological crises currently unfolding. Architect Hundertwasser conceptualizes the environment in terms of “the five skins of humanity”: the epidermis, clothes, house, identity, and Earth (Restany, 2000). In modern urban settings, however, a barrier seems to have formed between the last two. Identity, represented by the built environment of houses, buildings, and parks, is disconnected from the larger ecosystem of the Earth, the totality of organisms and elements, and the functioning of the whole environment.

Urban environment: The built landscape of cities and towns, shaped by human activity and infrastructure.

Ecosystem: A community of living organisms interacting with their physical environment as a dynamic system

The need for a renewed connection with nature.

It is becoming increasingly clear how climate change is affecting the Earth, with human activity being a significant contributing factor. Cities, which occupy only 3-4% of the Earth's surface, are responsible for two-thirds of global emissions (Day & Gwilliam, 2019). 77% of the emissions generated by humans are influenced by individual choices (Day & Gwilliam, 2019). This creates a responsibility to the surrounding world to make conscious choices. Living in an urban bubble, separated from the world that produces so much, reduces awareness of how these choices affect the ecosystem beyond. Disconnection from this ecosystem leads to decisions being made without understanding that they can harm the very system essential to life. Unknown makes unloved and unloved makes unprotected (Biesemans-Hoogewijk, 2024). By becoming more aware of the place within this larger ecosystem, a stronger intrinsic motivation may arise to make choices that positively influence it. Recognizing the role as part of a greater whole could lead to a desire to contribute to the continuation of that whole. As Kristine McDivitt Tompkins (2024) says in her TED talk about rewilding earth: ‘We know that when people reconnect with nature, it inspires them to protect it’.

Unknown
makes unloved
and unloved
makes
unprotected

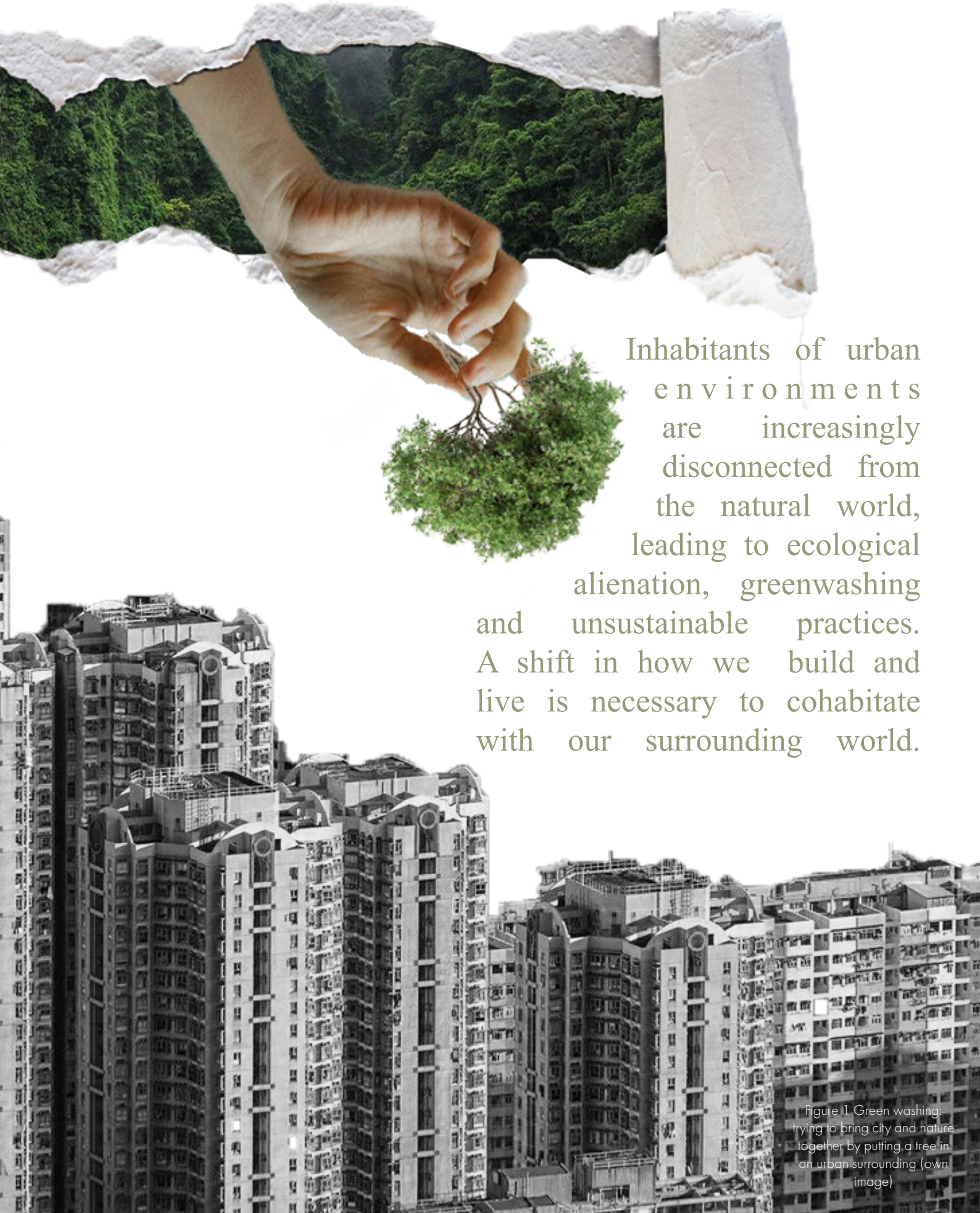
Kaat Biesemans-Hoogewijk



Problem of the city: it made a barrier - adaptation on Hundertwasser's five skins of humanity (own image)

Indigenous: Native people with deep-rooted cultural and environmental connections to their lands.

Problem Statement



Inhabitants of urban environments are increasingly disconnected from the natural world, leading to ecological alienation, greenwashing and unsustainable practices. A shift in how we build and live is necessary to cohabitate with our surrounding world.

Figure 1 | Green washing: trying to bring city and nature together by putting a tree in an urban surrounding (own image)

Objective

This research seeks to define a new approach to architecture in which people play an active role within their ecosystem. The goal is to increase awareness of the broader ecosystem they are part of, fostering a more conscious and respectful interaction with it. This study aims to find ways for people to move beyond a sense of superiority over nature, recognizing instead their intrinsic connection to it. In doing so, it responds to the current climate crisis, which is partly rooted in dualistic thinking (Maris, 2021), (Bloemink, 2023), (Watson, 2020). Ultimately, the research aspires to explore how people can engage in a reciprocal relationship with their environment, where individuals shape their surroundings and, in turn, are shaped by them. By analyzing case studies and relevant literature, this study aims to reveal design strategies that enable buildings to function as adaptable, living systems, creating a dynamic bond between urban inhabitants and the natural world around them.

‘The first step in saving nature is the rewilding of our own mind’

Kristine McDivitt
Tompkins



Questions

Research Question

How can architectural elements in an urban environment facilitate reciprocal relationships between people and their environments, leading to a living system with human engagement and heightened commitment to ecological care and preservation?

Design Question

The design seeks to inspire a generation to rethink their role within the ecosystem. Young people who are learning to find their place in the world are, therefore, an ideal target group. For this reason, the choice was made to design a school. A school also provides an opportunity to experiment with spatial concepts innovatively. Therefore, the design question will be as follows:

How can the design of a school integrate natural elements in ways that require students' active involvement, promoting a deeper connection to and understanding of local ecosystems?

Hypothesis

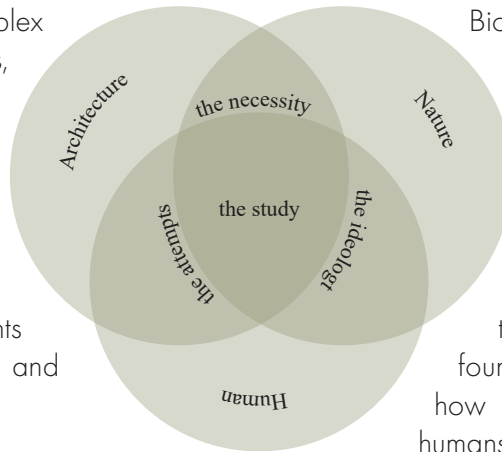
I hypothesise that a relationship can only grow through a reciprocal, co-dependent connection. The architectural elements could then create a dependent, living, growing, and changing building that requires effort to inhabit. With a reciprocal relationship between humans and their surroundings, people will feel more pride, develop a greater sense of ownership, and know the stories behind the building.



Hypothesis: living, growing building with proud people that have a reciprocal relationship with it

Theoretical Framework

This framework explores the complex relationships between humans, nature, and architecture through four primary themes: Human-Nature, Human-Architecture, Architecture-Nature, and Human-Nature-Architecture. Each theme draws on both supportive theories and critiques to examine how urban environments can foster ecological awareness and sustainable design.



Biologist Edward Wilson's Biophilia Hypothesis (1984) shares the idea of the interconnectedness of humans and nature, which supports both physical and psychological health. This view is also shared by Rousseau's (1755) philosophical work, which suggests that humans thrive when connected with nature. This foundation provides an understanding of how natural environments can encourage humans to care for and protect ecological systems.

Nature – Human

The Ideology

The **indigenous perspective** defines an **interconnectedness** between humans and nature, offering valuable insights into mutual respect and ecological relationships. Bloemink (2021, 2023), a journalist, and Kimmerer (2015), an Indigenous biologist, highlight the tradition of circular thinking, the dissolution of human-nature boundaries, and the intelligence of nature. This interconnected worldview has been part of indigenous cultures for centuries. This worldview can be adapted in the modern Western world, as Kimmerer states; anyone who makes the effort can become indigenous to a place, provided there is enough time spent observing, listening to, and forming a reciprocal relationship with the land where one lives.

Architects and theorists such as Watson (2020), Schittich (2019), and Ludwig & Schönle (2023) explore how these indigenous values can shape the built environment, producing structures that integrate perfectly with their surroundings. The living root bridges of the Khasi tribe in northern India are a striking example: these structures, formed by living roots, connect humans and nature. Rooted in the earth and growing slowly, they show patience and ecological symbiosis, blending culture with nature.

Indigenous perspective: A view that sees humans and nature as interconnected and inseparable.

Interconnectedness: The concept that all elements within a system are dependent and influence each other.

Critique: Virginie Maris (2021) critiques the movement toward human-nature fusion. Those who emphasise the integration of man into nature essentially make nature the habitat of man and are no longer able to recognise and protect it in its otherness. As a result, nature protection runs the risk of contributing to its downfall.

In this research, the indigenous perspective of humans as connected to nature, shared by Wilson and Rousseau, will serve as a framework. By viewing this human-nature relationship as an essential ideology within urban contexts, this framework promotes a counter-movement to the disconnection often present in modern urban environments.

Architecture – Nature

The Attempts

Ecological design theories integrate architecture with nature in the built environment. Kallipotti (2024) describes ecological design as integrating human and natural processes through architecture, a view shared by Kellert (2018), an architect, who combines architecture and nature with **biophilic design**—an approach that uses living and mimetic natural elements in architecture. Hundertwasser as an architect has never been officially associated with the

Ecological design theories: Design principles that integrate buildings with natural processes to support sustainability.

Biophilic design theory: Architectural approaches that foster human-nature connections for health and well-being.

term biophilic design. Yet Restany (2000) identifies design principles that align with biophilic ideals and make combinations with architecture and nature. Ludwig (2023) takes this further as an architect, promoting **growing architecture**- designs where nature is not mimicked but forms part of the structure, supporting direct human-nature interaction.

Critique: Day & Gwilliam (2019) critique many **“green” design** efforts as greenwashing, where designs display ecological elements as mere decoration rather than fostering meaningful connections with nature. This criticism could also be applied to both growing architecture and biophilic design when such design is merely exterior without fostering a deeper, functional relationship between architecture and natural systems.

In this research, ecological design principles will be explored, with a focus on designs that avoid superficial greenwashing and instead promote an active human-nature relationship within the urban environment.

Human – Architecture

The Necessity

The **impact of architecture** on human behaviour and perception is essential to developing sustainable urban environments. Gifford (2007), a professor of psychology and environmental studies, argues that architecture influences more than function—it shapes behaviours, perceptions, and a sense of belonging. Architect Habraken (1972) promotes participatory architecture, stating that when people have control over their environment, they develop greater ownership and responsibility, deepening their relationship with the space. Similarly, Lockton (2010) theorizes that participatory design can guide human behaviour, encouraging active engagement with the environment. Mang & Reed (2020) expand on this by emphasizing

that an active user role is crucial for a sustainable relationship within built spaces.

Critique: While participatory architecture seems promising for getting people more actively involved in their environment, it can be argued that the sustainability of this involvement is uncertain. When a design depends on the active engagement of residents, there is a risk that the project will fail as soon as residents lose their involvement or find the engagement too demanding.

Drawing from participatory and behavioural influence theories, this research uses the foundation that people will care more for their environment when there is active human engagement. The goal is to understand how architecture can encourage humans to become active in urban ecosystems, moving beyond passive occupation.

Nature – Human - Architecture

The Study

Though various studies explore elements of human, nature, and architectural interactions, few address this combination in depth, especially in the urban environment. Studies of ecological design often consider humans as passive users. Nature’s influence on humans view nature simply as greenery, rather than integrating nature as a crucial component. This research will use case studies to examine how architecture can foster a mutual relationship among humans, nature, and the built environment in urban spaces.

Drawing on the frameworks of each section, this study aims to identify designs where humans are active participants in their ecosystem. By understanding how these environments foster ecological awareness and ownership, the research seeks to develop a design strategy that strengthens the urban human-nature relationship through architecture.

Growing architecture: Architecture that adapts and evolves, often incorporating living elements that grow over time.

“Green” design: Design that aims to be sustainable by incorporating eco-friendly elements.

Architectural impact: The influence of design on human behaviour, environment, and social structures.

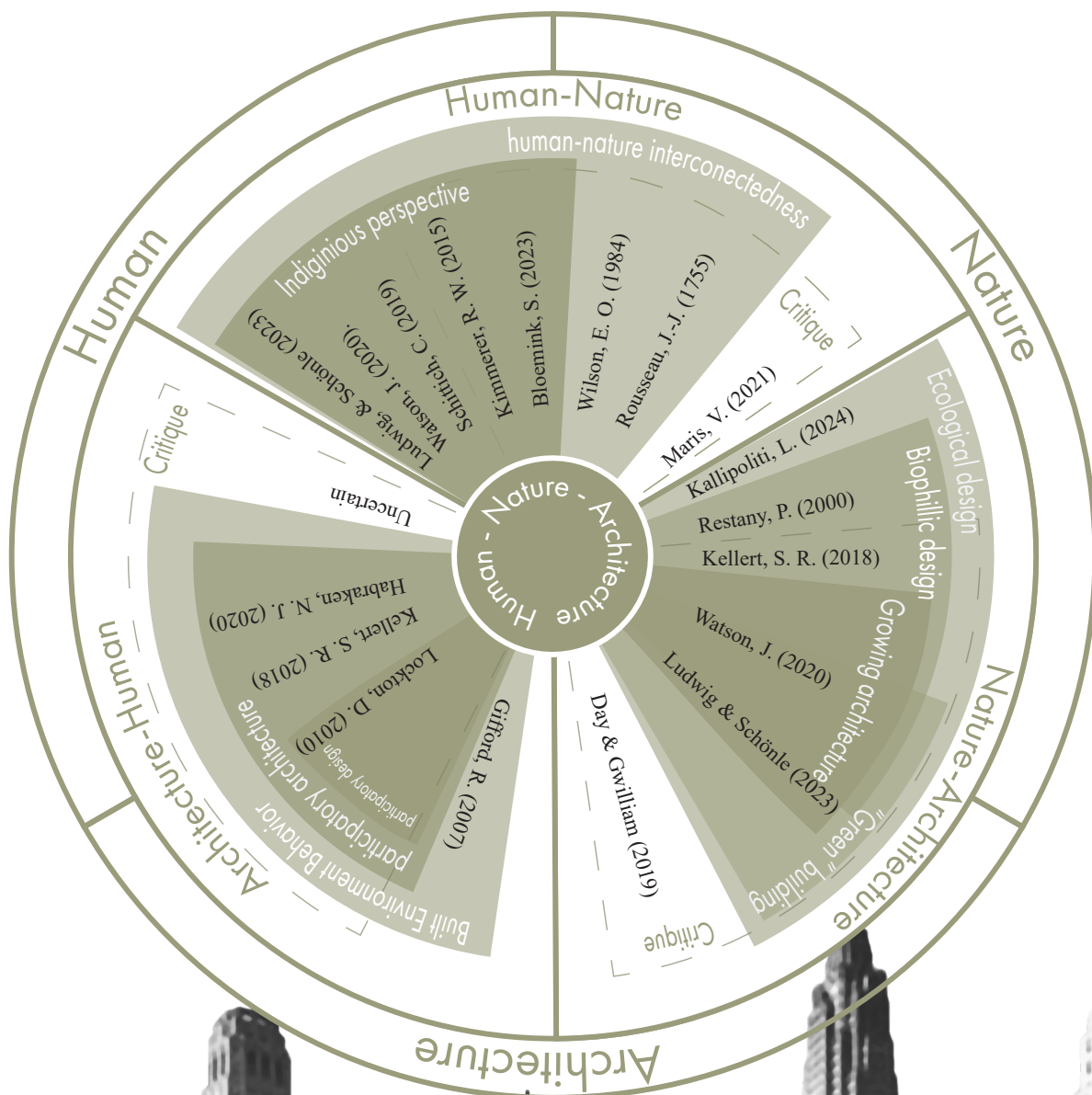
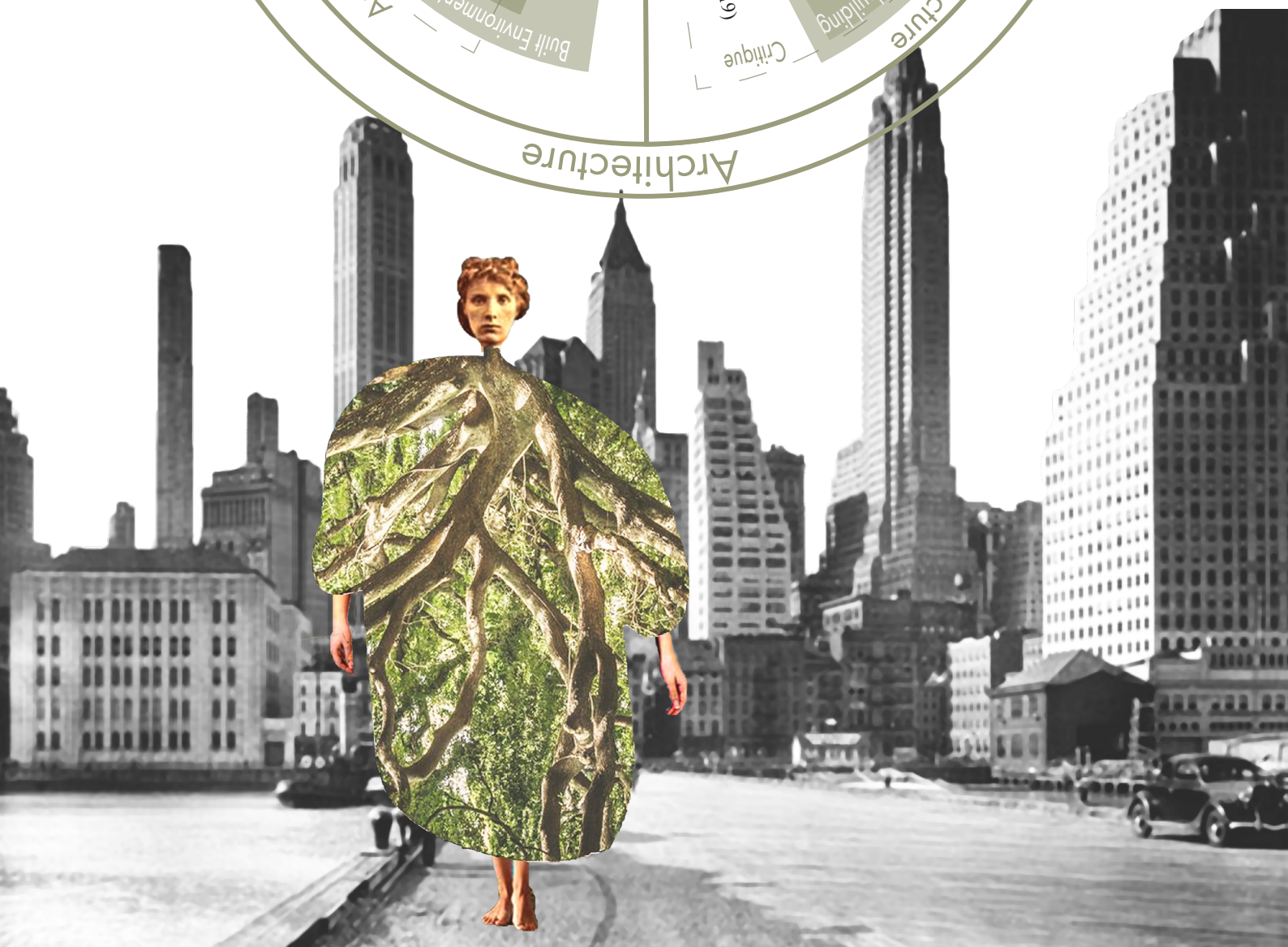


Diagram Theoretical Framework



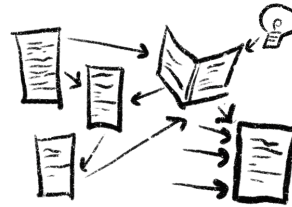
Methodology

Several methodologies will be applied in the study, these will be explained per sub-question.

How can the theoretical foundations inform the design of reciprocal relationship between individuals and their environments?

Method: Literature study
 Type: Qualitative
 Purpose: Gather theories that support architectural design can influence human behaviour

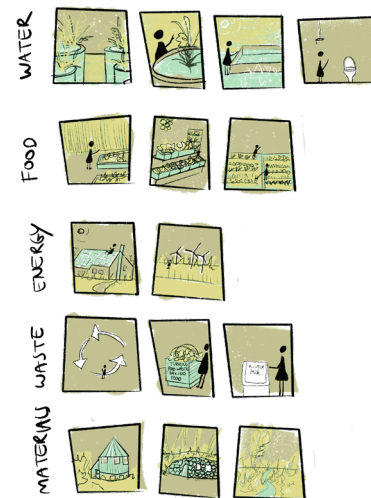
Expected Outcome



Literature review

How do individuals engage with specific architectural elements that encourage reciprocal relationship in the selected case studies?

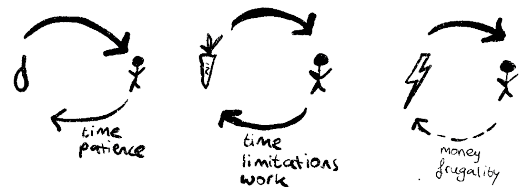
Method: Case studies analysis with comic-style illustrations and diagrams.
 Type: Qualitative- understanding human engagement.
 Quantitative- engagement is measured
 Purpose: Analyse interactions between people and architecture and behavioural and emotional responses to this relation



Comic style illustrations and diagrams

What is the balance between human involvement and the building's "response" in these case studies, and how does it influence ecological awareness and stewardship?

Method: Case studies analysis with comic-style illustrations and investment-gain diagrams. Focus on the temporal aspect, track changes and adaptability over time.
 Type: Qualitative- identifying types of investments and gains,
 Quantitative- frequency and duration of investments are measured.
 Purpose: Identify how efforts prompt a change in a building and how these efforts feature human-ecology relations.



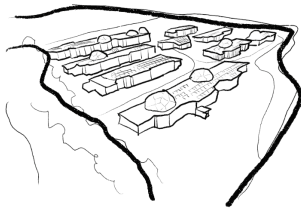
Investment-gain diagrams, see next page for a draft

Methodology Case Studies

The case studies will be projects where people have an active role in their built environment. Case studies of different scales and in different countries are used. Some examples:



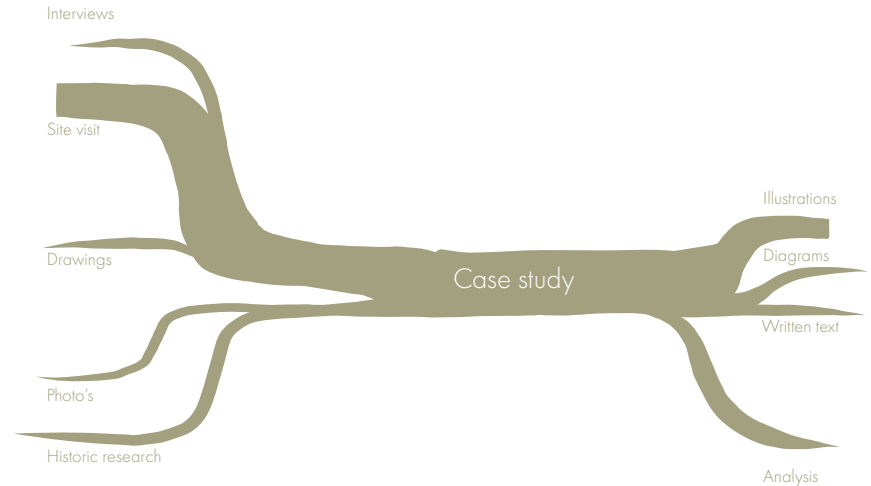
Finhorn - Scotland



Aardewoningen - Olst



Living bridge - India

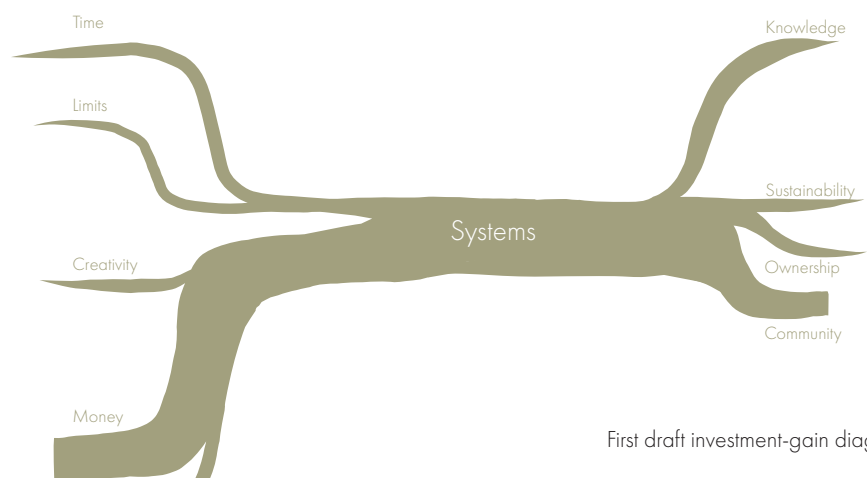


First draft analysis case studies

Case studies will be analyzed by applying various research methods. Site visits will be conducted, interviews held, drawings and photographs made, and a study will be carried out on the changes that history has brought to the building and its residents.

	What	Time	Limits	Money	Merits
Water	Explaining the system	How much per day/month/year	Constraints	Investments, maintenance	What do people get from this
Food					
Energy					
Waste					
Materials					
Natural Elements					

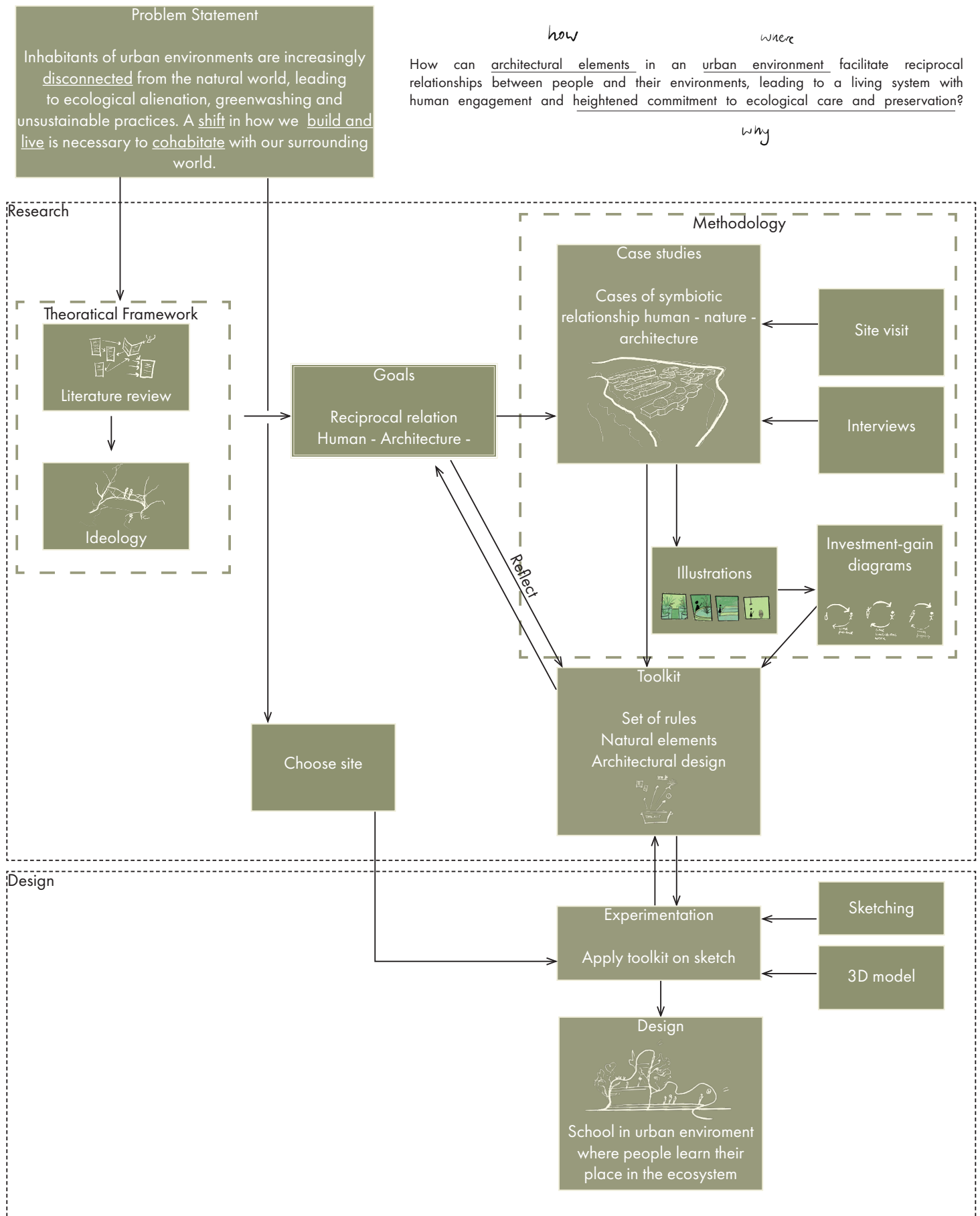
First draft analysis different areas



First draft investment-gain diagram

The relationship between humans, architecture, and the ecosystem will be analyzed through various areas: water, food, energy, waste, materials, and natural elements. This analysis will focus on what residents contribute (time, money, etc.) and what they receive in return.

Visual Research Diagram



Relevance

This study aims to provide an alternative to the current building environment, one where architecture not only exists within an ecosystem, but actively participates in it. This will answer a growing problem for future generations.

The growing gap between humans and nature is becoming a critical challenge, a challenge exacerbated by the fast pace and mechanised methods of contemporary construction. In the built environment, interactions between humans and nature are increasingly sacrificed for efficiency. Buildings are often designed with a focus on convenience and cost-effectiveness, leading to spaces that are disconnected from natural ecosystems and, in turn, also disconnect their occupants.

This research seeks to counter this trend by exploring how architecture can foster a deeper, more reciprocal relationship between people and their environment. By exploring designs that promote active, intentional engagement with the ecosystem, this research aims to develop design methods that inspire people to see themselves as part of nature rather than separate from it. Such architectural strategies can serve as responses to the environmental challenges of our time. As urbanisation and industrialised construction continue to increase, so does the need for buildings that invite connection to and care for the natural world.



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Planning

Week	Date		Important dates	Planning		
				Graduation Plan	Research Paper	Design Project
36	2 -- 8	sep		Developing Theoretical Framework	Collect Data	Graduation Plan
37	9 -- 15	sep				
38	16 -- 22	sep				
39	23 -- 29	sep				
40	30 -- 6	oct				
41	7 -- 13	oct				
42	14 -- 20	oct				
43	21 -- 27	oct				
44	28 -- 3	nov				
45	4 -- 10	nov	P1			
46	11 -- 17	nov		Case Studies & Reference Projects	Visits and Interviews	Edit theoretical framework
47	18 -- 24	nov				
48	25 -- 1	dec				
49	2 -- 8	dec				
50	9 -- 15	dec				
51	16 -- 22	dec				
52	23 -- 29	dec	Holidays			
1	30 -- 5	jan	Holidays			
2	6 -- 12	jan				
3	13 -- 19	jan				
4	20 -- 26	jan	P2	Concept Design	Sketch Design	Write conclusion
5	27 -- 2	feb	P2			
6	3 -- 9	feb	Holidays			
7	10 -- 16	feb				
8	17 -- 23	feb				
9	24 -- 2	mar				
10	3 -- 9	mar				
11	10 -- 16	mar				
12	17 -- 23	mar				
13	24 -- 30	mar	P3?			
14	31 -- 6	apr	P3?	Design		Details
15	7 -- 13	apr				
16	14 -- 20	apr				
17	21 -- 27	apr				
18	28 -- 4	may				
19	5 -- 11	may				
20	12 -- 18	may	P4			
21	19 -- 25	may	P4			
22	26 -- 1	jun				
23	2 -- 8	jun				
24	9 -- 15	jun				Finalising Design
25	16 -- 22	jun	P5			
26	23 -- 29	jun	P5			
						Models
						Prepare P4
						Prepare P5