

Graduation Plan

Master of Science Architecture, Urbanism & Building Sciences



Personal information	
Name	Tereza Lacigová
Student number	5634555

Studio		
Name / Theme	Urban ecology	
Main mentor	Nico Tillie	Landscape architecture
Second mentor	Remon Rooij	Urbanism
Argumentation of choice of the studio	In my opinion, one of the greatest challenges for a landscape architect nowadays is to deal with climate change, the topic of sustainability, and rapid development. Hence, I chose the Urban ecology lab, which focuses on improving biodiversity and ecology in urban areas.	

Graduation project	
Title of the graduation project	The elephant garden
Goal	
Location	Assam, India
The posed problem	<p>In Assam, North-eastern India, the human population has been growing rapidly, which inevitably brings more urbanization and expansion of agricultural lands, leading to deforestation and the disappearance of natural habitats for wild animals. In connection with that, new highways and train tracks are being built, cutting through the already shrinking natural areas. One of the species that especially suffer from these issues is the Asian elephant – the problems that these endangered creatures face have escalated to a serious human-elephant conflict with hundreds of casualties on both sides. (Akhtar, 2021)</p> <p>The Assam state is mostly a rural agricultural landscape, with large rice and sugarcane production, and is also one of the largest tea-growing regions in the world (C. Das, 2021). The tea estates, often located close to the forest edges are the hotspots of human-elephant conflict. To prevent the fragile tea leaves from sunburn and ensure the best quality of tea, shade trees are planted among the tree bushes, making the gardens suitable habitats for forest species such as elephants. (Bhattacharya, 2021; Amarendra & Das, 2022)</p> <p>They come to the gardens to find refuge from the sun, drink water from the ponds used by the tea workers, or just pass through. However, they face many obstacles, as the tea companies try to keep them out by enclosing the estates with fences, electric wires, or trenches, which not only block the elephants' migratory passages but can be deadly to them. (Akhtar, 2021; Amarendra & Das, 2022). The workers that pick and process the tea live in settlements within the tea gardens or adjacent to them, making them the first ones to come in close contact with wandering elephants, and the villagers who own paddy fields close to the tea estates</p>

often lose significant parts of their harvest to elephants that emerge from the gardens to feed on the rice. The locals are mostly dependent on agriculture as their only source of income and they resort to aggressive actions to keep the elephants away from their crops and villages, such as throwing fireworks, poisoning, or chasing the animals. (Bhattacharya, 2021)

This problem is also influenced by the fact that the tea communities are largely composed of immigrants who don't have the traditional knowledge of how to cohabit with elephants.

In addition to that, each year there are many train and highway incidents resulting in elephant deaths reported in the Indian media. The elephants are long-living creatures with good memory and repeatedly take the same routes, even when their corridors have been disturbed and interrupted by human activity.

This problem is especially strong along the boundary of the Kaziranga National Park, where animals migrate annually in large numbers and need to overcome the barrier of the national highway. (Vidhi Centre for Legal Policy, 2020)

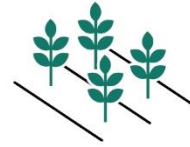
The human-elephant conflict in Assam is a pressing and life-threatening issue for both sides and although there are policies to mitigate it and small-scale spatial interventions (Hati Bondhu, n.d.-b), there is no existing landscape framework and vision to deal with the issue.



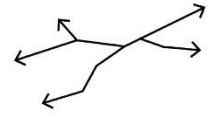
climate change



illegal mining



expansion of agriculture



expansion of road and railway network



water scarcity and pollution



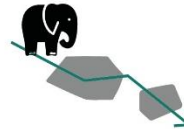
fragmented elephant habitats and obstacles in migratory passages



food scarcity for elephants and other wild animals



elephants come to drink and bathe in tea garden ponds used by the workers



elephants move through human environment and come to closer contact with people



elephants feed on cultivated crops



human-elephant conflict

Figure 1 schematic conclusion of problem statement

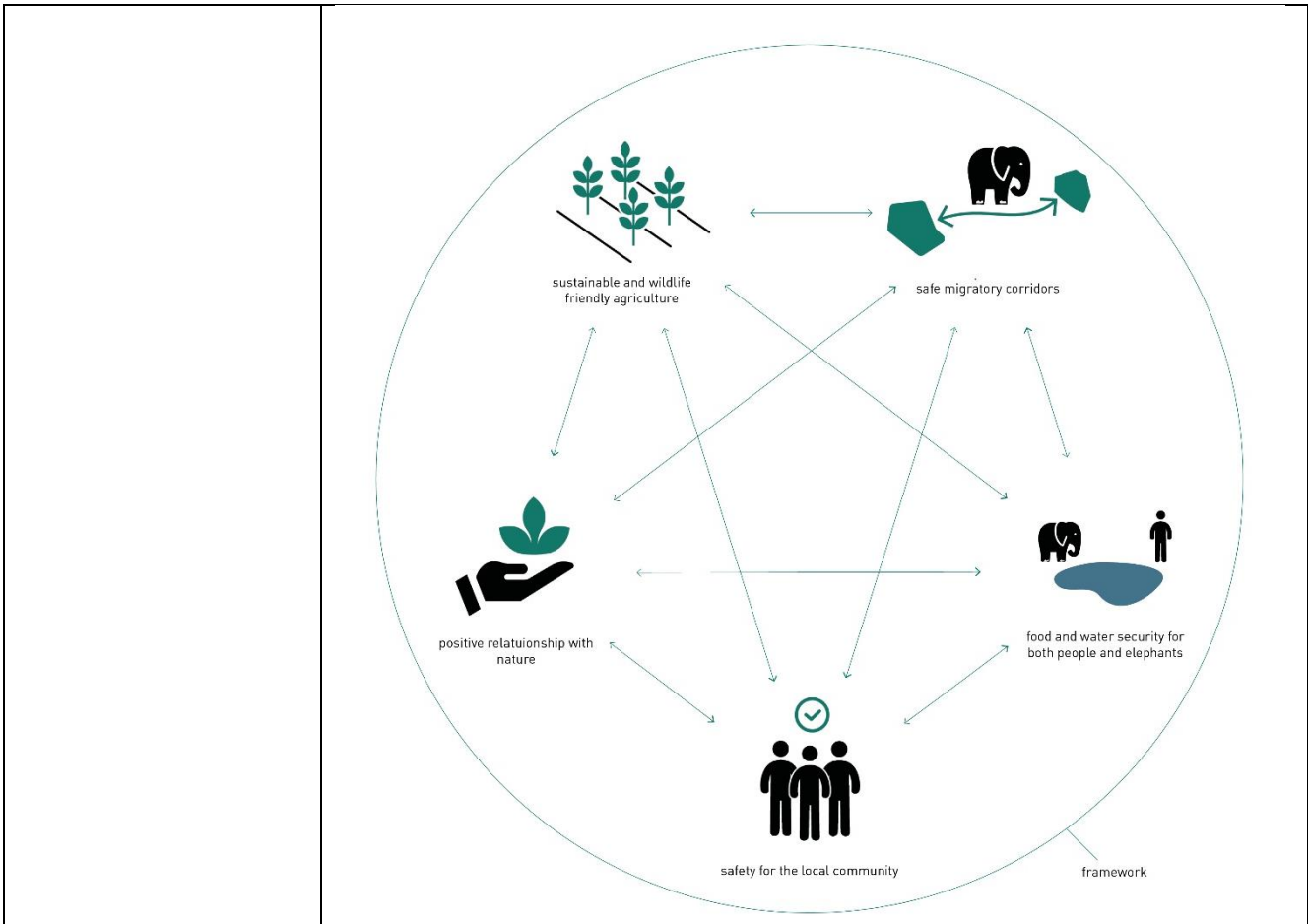


Figure 2 schematic conclusion of objective

<p>Research question</p>	<p>What regional landscape framework can help Assam to transform from a place of human-elephant conflict to one connected system in which people and elephants coexist?</p>
<p>Sub questions</p>	<ol style="list-style-type: none"> 1. How to transform current tea production practices towards sustainable and wildlife-friendly ones? 2. How to provide living space and enough food for elephants? 3. How to design passages for wildlife through the villages, tea gardens, and across infrastructure? 4. How can the changes be implemented in a way that will also benefit people?
<p>Design assignment</p>	<p>The research-by-design phase will focus on the central area of Assam state, mainly on the edges of forested Karbi hills lined with small tea plantations and the Kaziranga National Park. The aim of the design assignment is to formulate a future vision for a landscape where people and other species cohabit, culture and nature function together as a part of one system, and the current tea plantations are transformed into new biodiversity zones and a part of wildlife corridors. The design question and sub-questions will be answered in parallel throughout the research by the design process.</p> <p>The products in which this design assignment will result can be described</p>

as follows:

1. Regional vision and masterplan for the central Assam area, aimed at creating a more sustainable agricultural landscape and connectivity for the wildlife
2. Toolbox of design strategies aimed at mitigating the human-wildlife conflict
3. Masterplan on a medium scale (village complex, one tea estate), implementing strategies from the toolbox in a site-specific design
4. Detailed small-scale design interventions on selected location(s)

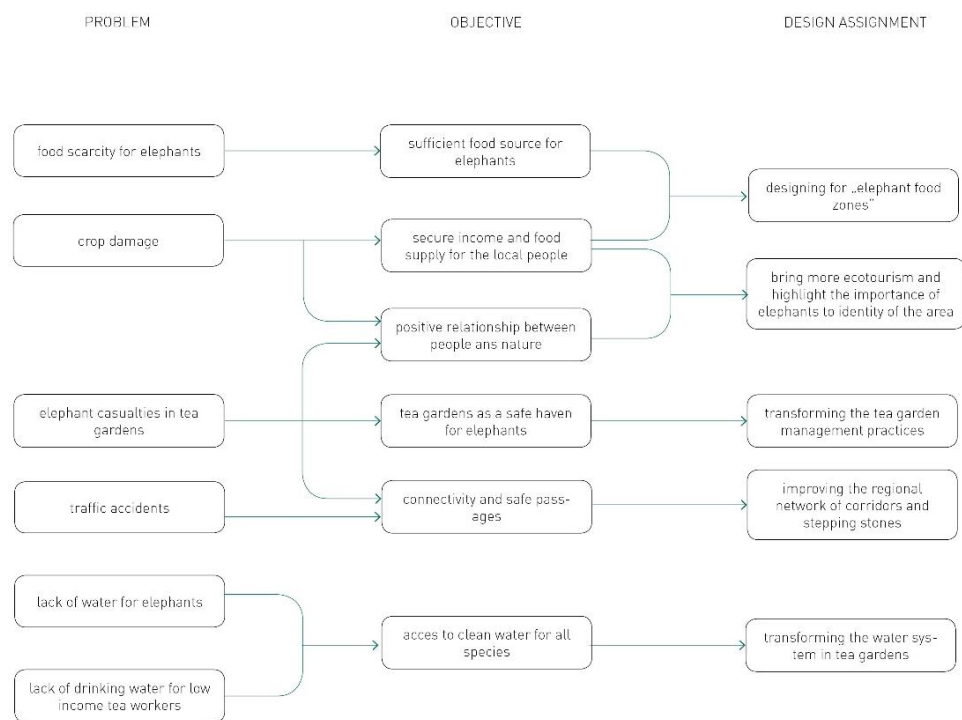


Figure 3 from problem statement to design assignment

Process

Method description

The focus of the project is to answer the research question, which will be done through two main phases – the research phase and the research-by-design phase.

However, these phases are not completely divided, as they will partly overlap, and the process is not linear, as the workflow scheme shows (fig. 4)

Research

- The aim of the research is to understand the site and problems using different analysis methods, such as mapping, collecting data, reading, visiting the site, interviewing local inhabitants, sketching, etc.
- another important part of the research phase is to learn about the opportunities and possible approaches that can be used through reviewing case studies and literature about landscape architecture theory and to understand elephant behavior and needs in order to assess what spatial interventions can be done to improve the condition for them. Based on

this analysis, a theoretical framework for the research by design is formulated.

Research by design

The research-by-design phase is focused on fulfilling the design assignment that the research question results in.

- Based on the results of the site analysis and theoretical research, a vision for an improved system in which people and elephants coexist is proposed
- Different strategies will be proposed and then tested through design experiments
- The interventions proposed will be on multiple scales (from regional vision map, through more zoomed-in masterplan to detailed design) and will be developed in parallel, going back and forth between scales
- Aside from drawings of the design, model experiments and model showing the detailed design will be made
- In the end of the design process, between P4 and P5 a reflection will be done to assess and improve the final design.

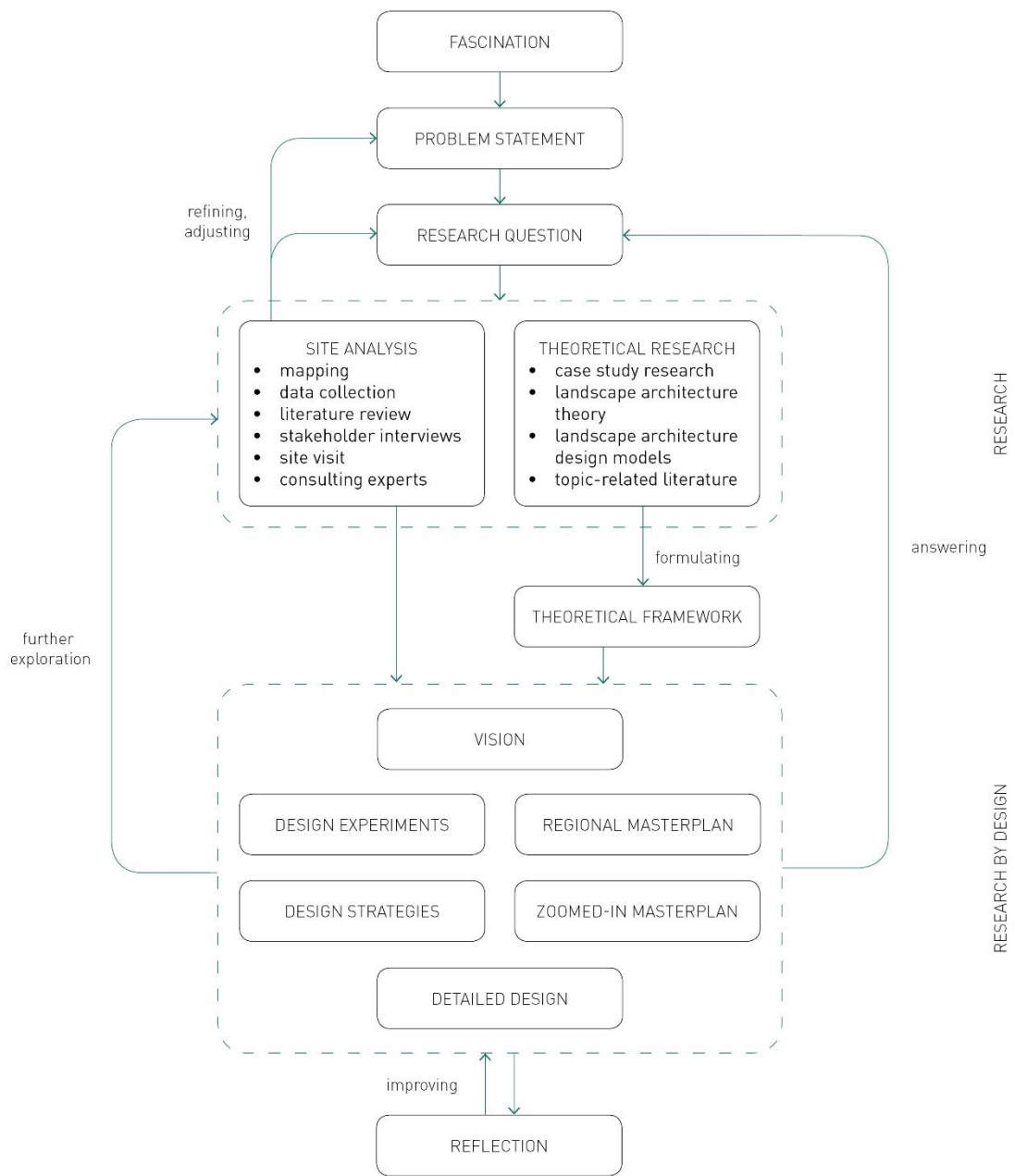


Figure 4 workflow and methods scheme

Reflection

1. What is the relation between your graduation (project) topic, the studio topic (if applicable), your master track (A,U,BT,LA,MBE), and your master programme (MSc AUBS)?

In the Flowscapes studio approach, the focus is on the movement and flows that together form a complex system. In relation to that, this project is exploring the systems of animal migration, flows of agricultural production and human movement and their relation.

Moreover, this thesis aims to create a future vision for a landscape where people and other species cohabit, culture and nature function together as a part of one system, and the current tea plantations are transformed into new biodiversity zones and a part of wildlife corridors, which is derived from the approach of the Urban Ecology, that views cities (and by extent all “human habitats”) as one ecosystem connected to nature.

The working process builds on the knowledge gained in MSc1 and MSc2, such as the layer approach method etc.

2. What is the relevance of your graduation work in the larger social, professional and scientific framework?

The human-elephant conflict in Assam is a pressing and life-threatening issue for both sides and as mentioned above, although there are policies to mitigate it and small-scale spatial interventions, there is no existing landscape framework and vision to deal with the issue. The graduation project will aim to help the preservation of endangered elephants by proposing ecological corridors, creating a space for them in the human-dominated landscape, and turning the tea gardens into safe refuges for them. In this new landscape, where wildlife will have enough space and sources of food, the occurrences of elephants feeding on crops or damaging villages will become less common and the safety of workers in tea gardens.

Furthermore, the design strategies should be a starting point for future projects aimed at dealing with human-wildlife conflict in different contexts.

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