Based on former experiences in the Brazilian context in the field of architecture, construction and trade between the Netherlands and Brazil, I decided to dedicate my graduation project to the island Ilha de Paquetá, located in the middle of the bay of Rio de Janeiro. The clear scope and iconic location made me choose this site. I saw the opportunity to project a ‘circular’ strategy to improve the environmental and economic performance of the place. The knowledge and tools that I have learnt in the master’s program Industrial Ecology, I could integrate this way in my Architecture graduation project.

RESEARCH AND DESIGN

Research approach
The research approach for my graduation project is twofold. On one hand, there is the very systemic approach of urban metabolism and circular economy. This part of the research, resulting in a Material Flow Analysis (MFA) for energy, water and material consumption on the island, shaped the boundary conditions and solution space for the interventions to be developed. The MFA was the focus during the first part of the graduation project and led to a set of possible interventions on system level to improve the environmental state of the island. However, this very analytic approach does not provide insights or inspiration towards architectural or urban design.

Therefore, another research layer was added: achieving a deep understanding of the culture, history, society, geography, built environment and traditions. The acquired ‘sense of place’ gave inspiration and design ideas that the analytical research approach didn’t.

METHODOLOGY - For both researches, the systemic layer (top-down perspective) and the context-sensitivity layer (bottom-up perspective), fieldwork has been carried out. For composing the MFA a questionnaire and interviews with companies were the applied research methods to collect the required data. For understanding the place, information was acquired via conversations, interviews, observations, filmmaking and (historical) literature reviews.

Resulting design
Building program: After the initial idea to build a recycling facility, it was concluded that a swimming pool with community functions could be a valuable addition to the island, for the following reasons:

1. Tourism. One of the main tourism attractions have always been the beaches, but due to the pollution of the Guanabara Bay, swimming is no longer possible.

2. Metabolism. The function of a swimming pool can make valuable metabolic connections with the current system (similar as a recycling facility does): bay water is cleaned, used for the swimming pool and given back to the surface water. Organic waste is put in for extraction of fertilizers, heat and electricity.

3. Architectural design and placemaking. More than a recycling facility, a swimming pool and community functions very much relate to the context and opens possibilities to express that in the architectural design. For filtering the bay water, wetlands with local purification plants are integrated in the design. In materialization, the local materials granite and earth are used. The tectonic of the wooden structure is inspired on the pergolas by a famous painter and inspirator of Paquetá, named Pedro Bruno. The construction methods are all simple, low tech, easy to understand and possible without the use of uncommon tools and knowledge.

In conclusion: the functional/programmatic ideas for the intervention are based on the understanding of both the urban metabolism and the needs of residents and tourists. The elaboration of this in an architectural finds its roots in a thorough understanding of the place (culture, history, identity, history, geography, building tradition).

RELEVANCE

Architectural Engineering Studio
The thematic focus of the Architectural Engineering Studio is in line with my personal interest and specialization of the last couple of years: circularity, productiveness of the city, and similar approaches in response to the current take-make-dispose economy. In the ‘flow’ direction, similar research questions related to urban metabolism and circular
The concept of a circular economy is very much embraced by Dutch governments and some Dutch companies and knowledge institutions, but much less known in Brazil. In my graduation project my first aim was how to apply the concept in a real Brazilian urban context (including the proposal for practical interventions).

This first stage of the project resulted in a complete MFA for the whole island, which is very much a top-down view on the current situation. Based on this quantification I could propose interventions from a system-level perspective. The insights that I gained from the bottom-up approach (observations, a questionnaire, photography, etc.) played a minor role in the research results that I presented after the first semester.

2nd phase: ‘Let’s make a beautiful project’

Reflection on this in a three-month summer period made me realize that my focus was too much on the analytical side of the project. A two-week cycling holiday gave me the time to really digest the observations and knowledge that I gained from fieldwork and research. And when I visited Oerol festival on the beautiful
Dutch island Terschelling, I saw many location specific landscape architecture projects. One example is ‘Gegrond’, by Elmo Vermijis, which is a very simple building form, made of local materials, that really gave me the ‘sense of place’. I realized that making a project is not only about proposing the best interventions from a system-level perspective and by understanding social structures, but that the landscape, the geography, the culture, the history of the place are equally important.

This made me study some literature that I had collected during the fieldtrip, about the culture and history of Ilha de Paquetá. The main insight was the role of the painter Pedro Bruno in the beginning of the twentieth century, who founded the ‘Liga Artística’ with the aim to preserve the natural landscape and (animal) life. Furthermore, I understood much better how the building tradition had developed over time.

3rd phase: ‘Let’s make the island a better place’

On top of that, I now much less believe in circularity (or ‘sustainability’ in general) as the central goal where a project derives its identity from. I do more believe that, in a time of major concerns about resource consumption and climate change, it is not more than a self-evident underlying condition of any kind of project.

In the case of Ilha de Paquetá, there is much more going on than environmental performance. The map of pains, that was constructed in a very early phase of the project, where mentioned: high costs of living, few jobs, dusty roads, little things to do, the polluted Guanabara Bay, dependency of the local economy on tourism, tourism decline and a strong separation between tourists and residents.

These ‘pains’ all relate to each other and can play a major role in a future strategy for Ilha de Paquetá. Therefore, I shifted the priorities in my project from ‘something circular’ to ‘something to make the island a better place’. The building that must do this is no longer a recycling facility, but a swimming pool.

LOOKING AHEAD

The main challenge towards finalizing the project lies in the relation between the architectural design and the island strategy. After setting the main boundaries for the strategy, choosing the interventions and proposing a prioritization, the focus had shifted to the building design. The challenge is to align (and re-align if necessary) the building with other interventions, such as organic waste collection system and different modes of transportation.

‘My graduation project shows how the Circular Economy system-level perspective can be combined with a hyper-local and pragmatic approach to achieve social inclusion.’