

Graduation Reflection

**The dichotomy of riverbanks :
Paradox of wasted landscapes and housing redevelopment**

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Architecture of transition in the Bangladesh Delta

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

The studio's focus on housing as a global phenomenon and the urgency of providing adequate housing, improve living conditions and promote social equity in rapidly growing developing countries, which serves as a foundation for the project's exploration of comprehensive urban redevelopment. The main design objective, focused on revitalizing the riverbank and adjoining slum in Sylhet, uses housing redevelopment as a catalyst. The project aims to foster a resilient and sustainable waterfront, directly addressing the pressing challenges of housing shortage, low-income housing, and solid waste management in the context of Bangladesh's urban development. The project further explores the intersections between community and waste, and architecture and waste, emphasizing the need for sustainable design interventions and the role of architecture in shaping socio-spatial relationships to raise awareness and promote responsibility for durable waste management.

2. How did your research influence your design/recommendations and how did the design/recommendations influence your research?

Initially, the research influenced design. Research on the local community's living conditions informed the design of spaces that cater to their specific needs and activities, creating an environment that aligns with the current residents requirements. Research on the current methods of solid waste treatment led to the design of an adequate space dedicated to waste segregation and recycling for further use.

At this stage, design made the link between housing and solid waste. The design influenced research by exploring how recycled and salvaged building components from waste could be integrated into housing. Making use of recycled materials reduces construction costs, decreases open-field waste dumping, and provides income generation opportunities. In line with the suggested paradigm shift from a linear to circular built environment, the project investigates ways to support recovery and reuse in the local context of Bangladesh. Because of its unique potential for reuse, steel is chosen as the main material for the project's structural components. Integrating locally produced as well as repurposed steel beams from decommissioned buildings in the region for the new housing redevelopment results in a shortened supply chain. Additionally, these beams may again be recovered for reuse in future projects after their possible end of service life in this project. This method shows how research and design may be successfully integrated to produce sustainable construction practices.

3. How do you assess the value of your way of working (your approach, your used methods, used methodology)?

The planned methodology proved relevant, and I conducted my research and design according to the planned methods of fieldwork, mapping, literature review, and comparative case study analysis. The literature review involved some iterative processes. For instance, I initially considered and then discarded the idea of using waste as building materials, focusing instead on waste segregation. However, I later revisited the potential use of waste in the design to make it an integral part of the housing project. This led to an in-depth investigation of circular economy.

Case studies were essential in understanding how theoretical concepts from the literature are implemented in real projects. They allowed me to incorporate elements from various case studies, each

time focusing on a specific aspect, such as building components, structure, or recycling facilities, to inform particular parts of my project.

4. How do you assess the academic and societal value, scope and implication of your graduation project, including ethical aspects?

The project addresses two pressing issues: the housing shortage in metropolitan regions due to significant rural-to-urban migration and the escalating concerns about solid waste, a major environmental problem in developing countries such as Bangladesh. It contributes to the discourse on sustainable urban development in regions facing these challenges by proposing comprehensive strategies for waste segregation and circular design strategies, offering insights into how theoretical frameworks may be applied in practice.

The project promotes positive behavioral changes in waste management and aligns with ongoing discussions on circularity and sustainable resource management. It introduces a preliminary concept for a small-scale solid waste management strategy and offers a way to provide affordable housing for a mixed-income community by using waste materials in the construction and involving the residents in the waste collection and recycling process. This way, the project adds value both to the academic discourse as well as society, proposing considerable social and environmental contributions.

5. How do you assess the value of the transferability of your project results?

The transferability of the project fundamentally lies in its design elements, as well as its managerial strategy. The project addresses waste management particularly along significantly affected riverbanks, where local authorities struggle to manage daily waste production due to rapid population growth and ineffective waste treatment systems. Simultaneously, the project addresses an increasing housing shortage in Bangladesh amid growing numbers of informal settlements and slums. Divided into two phases, the project focuses on creating a waste-treatment facility transforming solid waste into building materials first, supporting phase two, the development and delivery of a housing project, by providing it with these components. Although highly interlinked, phase one could also be separated and support the construction of any other architectural project.

The transferability of the project regarding its design elements is diverse, however a few elements should be mentioned. The clustering results in a delicate relationship of private, semi-private, and public spaces, providing a sensitive solution for residents of different income groups in a highly dense neighborhood. Additionally, the widely available material steel has a unique potential for reusability, which supports the integration of circularity aspects, making it flexible and useful in a variety of scenarios.

The transferability of the projects managerial strategy essentially lies in its organizational structure, including the municipality acquiring land 'ownership' through leasehold, and a unique financing scheme involving public private partnerships (PPPs) per project phase, ensuring financing and construction in the respective phases. Further, the procurement strategy for each phase is transferable, featuring early involvement of all relevant stakeholders in the design team (architects, urban planners, internal and external consultants, contractors and subcontractors, NGOs safeguarding the values of vulnerable communities, as well as circularity experts and salvaged materials brokers).

Replicating this model across the entire urban fabric could have a significant impact on the environment and inhabitants, promoting cleaner urban areas, healthier and sustainable environments, and improved quality of life. Additionally, this approach can be adapted to different climates and contexts, producing various materials from different types of waste.

6. How do you reflect on the ethical considerations of designing for vulnerable communities in the “Global South”?

Designing for vulnerable communities in the so-called “Global South” and proposing a solution that aims at improving a local situation from the position of privilege is certainly an ambivalent stance to take.

The United Nations, led by the most powerful countries of the so-called “developed economies” or “Global North”, lead the charge against global warming, adopting themes such as sustainability and circularity and deploying development programs, while being responsible for the underlying mechanisms in the first place. Sadly, it is the already struggling “Global South” that is the most vulnerable to the effects of climate change. Communities in Bangladesh are among the first victims of rising sea levels and increasingly extreme weather events due to several factors. These include its unique geographic location and flat deltaic topography, extreme climate variability (Monsoon), its high population density and poverty rate, and the dependency of the majority of the population on crop agriculture, highly influenced by climate variability and change itself, all of which is compounded by a catastrophic waste generation in the rapidly urbanizing country.

Bangladesh and other nations like it are unable to meet the objectives set by the “Global North” as they are often preoccupied with their basic survival needs. Simultaneously, the “Global North” offers aid to the “Global South”, imposing Western solutions on vulnerable local communities, a behavior sometimes referred to as “neo-colonialism” because of its underlying arrogance and ignorance towards local contexts. This might also extend to the proposition of solutions for waste management as well as the implementation of circular strategies in the built environment.

This becomes obvious when reflecting on the question of circularity. While “the West” is paranoidly working on how to overcome the current take-make-waste paradigm and implement circular strategies, communities in slums, have forever acted “circular” in the sense that material reuse is a common practice. An example for this is the reuse of CI-sheets, slums in Bangladesh are almost only built from salvaged materials. However, being worried about survival, material reuse is not adopted as a systemic approach but rather out of necessity. Moreover, adopting European principles of how circular principles and sustainability should be executed, be it the recycling of solid waste for secondary building materials or the reuse of salvaged components such as steel beams, might emphasize and support local efforts.

Accordingly, this project aims at respecting the local community and context by promoting active community participation in the creation of building secondary materials for their new homes, fostering a sense of ownership and pride. At the same time, this approach encourages a shift in the perception and awareness of the omnipresent waste, demonstrating the benefits and aesthetic possibilities of recycled materials as well as persuading municipalities such as Sylhet City that they can turn solid waste into useful resources. As a result, residents themselves will demonstrate that living in an apartment constructed partly from repurposed materials doesn’t need to be a drawback, instead that it may be just as elegant as one constructed from new materials.