

Graduation Plan

Master of Science Architecture, Urbanism & Building Sciences



Graduation Plan: All tracks

Submit your Graduation Plan to the Board of Examiners (Examencommissie-BK@tudelft.nl), Mentors and Delegate of the Board of Examiners one week before P2 at the latest.

The graduation plan consists of at least the following data/segments:

Personal information	
Name	Mark van Kats
Student number	5303370

Studio		
Name / Theme	Global Housing - Architecture of Transition in the Bangladesh delta	
Main mentor	Rohan Varma	TU Delft, Faculty of Architecture & the Built Environment, Department of Architecture, Group Architecture & Dwelling
Second mentor	R. Conesa Sanchez	TU Delft, Faculty of Architecture & the Built Environment, Department of Architecture, Building Technology and Engineering
Argumentation of choice of the studio	I chose the Dwelling Graduation Studio: Global Housing because I believe housing is one of the most pressing issues in today's-built environment. What draws me to the Global Housing Studio is its focus on areas facing significant environmental challenges and where affordability is of critical importance. In this studio, the context plays a pivotal role, which I find particularly intriguing. I believe this global perspective on housing will enrich my experience. After completing this studio, I hope to contribute not only to addressing the housing crisis through mass housing but also by incorporating these essential contextual features into my work.	

Graduation project	
Title of the graduation project	Living Markets
Goal	
Location:	Hawkers Market, Sylhet, Bangladesh
The posed problem,	Bangladesh faces critical housing challenges driven by rapid urbanization, climate vulnerability, and limited land availability. Cities like Sylhet,

	<p>experiencing significant population growth, highlight the urgent need for resilient and adaptable housing solutions. While modern construction techniques address the demand for rapid and cost-effective housing, they often lack the flexibility and cultural sensitivity inherent in traditional housing. This loss of adaptability compromises the ability of homes to meet evolving family needs, respond to environmental conditions, and foster community cohesion.</p> <p>A sustainable solution lies in integrating modern construction's efficiency with the adaptability of traditional housing. By exploring modular and Open Building frameworks, it is possible to create housing that is resilient to environmental pressures while maintaining cultural relevance and social stability. This approach aims to address Bangladesh's housing crisis holistically, providing shelter that supports both community well-being and environmental resilience.</p>
<p>research questions and</p>	<p>Main Research Question "How can traditional adaptive housing features be combined with modern construction practices to create durable, flexible, and culturally responsive housing solutions for flood-prone areas like Sylhet?"</p> <p>Sub Questions: "What are the key adaptive features of traditional housing models in Sylhet that make them well-suited to flood-prone environments?"</p> <p>"How can modern construction techniques be applied to enhance the material durability and resilience of traditional housing features in flood-prone regions like Sylhet?"</p>

	<p>“In what ways can the cultural and spatial flexibility of traditional housing models contribute to the long-term sustainability of housing solutions in Sylhet?”</p>
<p>design assignment in which these result.</p>	<p>This design assignment is to create adaptable, climate resilient dwellings on this Hawkers Market location in Sylhet, Bangladesh. This is a location which is at risk for climate change, but also neighboring markets has as an important feature of the location. The project will focus on:</p> <p>Understanding the Site A comprehensive analysis of the Hawkers Market location in Sylhet is essential. This includes studying the physical, social, and economic context, assessing vulnerabilities to climate change, and understanding the interaction between the market and surrounding urban fabric.</p> <p>Learning from Tradition Traditional housing in Bangladesh offers valuable lessons in adaptability and resilience, using locally sourced materials and techniques suited to environmental and social needs. These elements will inspire innovative designs that honor cultural heritage while addressing modern challenges.</p> <p>Combining Markets and Housing The project will explore strategies to integrate housing with the vibrant market activity of the site. By merging these functions, the design will aim to create a cohesive space that fosters economic opportunities and strengthens the connection between community and livelihood.</p> <p>Ensuring Longevity Beyond environmental resilience, the dwellings will be designed to ensure social sustainability. Flexibility in the design will allow for personalization and</p>

adaptation over time, accommodating changing family needs and fostering a sense of ownership and community cohesion.

The primary aim of this project is to enhance living conditions in flood-prone areas like Sylhet, Bangladesh, by designing housing that integrates modern construction techniques with the adaptive and culturally resonant features of traditional Sylheti architecture.

To achieve this, the project will focus on:

1. Identifying Adaptive Features

Examine traditional Sylheti housing to uncover design elements, such as elevated structures and the use of local materials, that contribute to environmental resilience and adaptability.

2. Integrating Modern Techniques

Explore how modular and prefabricated construction methods can improve material durability, speed, and cost-efficiency while maintaining cultural and spatial flexibility.

3. Promoting Social and Cultural Sustainability

Design spaces that accommodate evolving family needs, foster community cohesion, and preserve cultural identity, ensuring the housing remains viable in the long term.

The outcome will be a hybrid housing model that provides scalable, sustainable, and disaster-resilient solutions while serving as a valuable resource for architects and urban planners working in similar contexts.

Process

Method description

To achieve the goal of designing scalable, sustainable, and disaster-resilient housing solutions for flood-prone areas like Sylhet, this research adopts a comprehensive mixed-methods approach. By combining theoretical analysis, practical case studies, fieldwork, and participatory feedback, the study aims to bridge the gap between traditional and modern construction techniques. Each method contributes a unique perspective, ensuring the final design is both culturally and environmentally sustainable.

1. Literature Review

The literature review will analyze research on vernacular architecture in flood-prone areas and modern construction techniques. This includes examining the cultural and environmental resilience strategies of traditional Sylheti housing and exploring how prefabrication and modular systems can complement these designs.

2. Case Study Analysis

Case studies of adaptive and hybrid housing projects from Bangladesh and other similar contexts will be analyzed. These studies will provide insights into materials, structural configurations, adaptability features, and environmental performance, identifying best practices for integrating tradition and modernity.

3. Field Observations

Fieldwork in Sylhet will document key features of traditional housing, including construction methods, spatial arrangements, and adaptability to environmental challenges. Observations of social spaces and housing layouts will provide a deeper understanding of how traditional homes meet evolving family and community needs.

4. Interviews with Residents and Experts

Semi-structured interviews with local residents, architects, and policymakers will explore housing needs, cultural preferences, and perceptions of traditional and modern housing. These interviews will help refine practical solutions, ensuring designs are feasible and aligned with community expectations.

This integrated methodology ensures that the research addresses both the technical and cultural dimensions of housing design, resulting in practical, adaptable, and scalable solutions for disaster-prone regions.

Literature and general practical references

References in Research Plan:

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Schneider, T., and Till, J. (2005). Flexible housing: Opportunities and limits, *Architectural Research Quarterly*. Vol. 9, Issue 2: pp. 157-166. DOI: <https://doi.org/10.1017/S1359135505000199>.

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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)?

This project aligns with the studio's focus on housing within both a global and local context. It also addresses the challenges posed by the significant environmental impact in such vulnerable areas. The topic is closely related to the overall emphasis of the master's track on architecture and the built environment, particularly the integration of traditional practices with modern construction features in contemporary housing design. Additionally, the project connects to the broader MSc AUBS program, as it draws on elements from various master tracks. This includes developing a masterplan (Urbanism & Landscape Architecture) and designing buildings with a

focus on sustainable, structurally sound, and technically appropriate materials and methods (Building Technology).

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

The relevance of this graduation work lies in addressing the critical challenge of developing resilient, culturally appropriate housing in areas with some big environmental influences. By combining traditional adaptive features with modern construction techniques, this study seeks to create housing that meets both environmental and social needs. It is especially timely in the context of climate change, as regions like Sylhet face increasing environmental risks. The research also contributes to broader global discussions on sustainable architecture, offering insights for other disaster-prone areas facing similar challenges, such as Southeast Asia, Africa, and island nations impacted by rising sea levels.