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	Tim Schuurman
Student number	5164958

Studio		
Name / Theme	AR3AD105 Dwelling Graduation Studio: Globale Housing	
Main mentor	Prof.ir. D.E. van Gameren	Hoogleraar Woningbouw - Department Architecture
Second mentor	R. Conesa Sánchez	Teachers of Practice / AE+T
Argumentation of choice of the studio	I chose the Dwelling graduation studio: Global Housing because of my passion for designing smart and efficient floor plans, particularly within the context of affordable housing. I am drawn to the challenge of creating spaces that are not only functional and adaptable but also foster a sense of community and well-being. The studio's focus on addressing global housing issues provides an ideal environment to explore innovative solutions that balance affordability with quality design. This approach aligns with my belief that thoughtful planning and design can significantly enhance the quality of life, even within constrained budgets, while contributing to more equitable and sustainable housing solutions worldwide.	

Graduation project	
Title of the graduation project	Adapting to Rising Waters
Goal	
Location:	Shonatola, Sylhet, Bangladesh
The posed problem,	Flooding is a recurring issue in Bangladesh, with Sylhet being particularly vulnerable due to its location within the Ganges-Brahmaputra-Meghna (GBM) delta. Annual monsoon floods, intensified by climate change, now impact up to 90% of Sylhet during peak flood years, causing significant socio-economic disruptions. In 2022 alone, 6 million people across Bangladesh were

	affected by floods, leading to widespread displacement and agricultural losses. Rapid, unplanned urbanization in Sylhet has compounded the issue by encroaching on wetlands and disrupting drainage systems, reducing the region's natural capacity to manage excess water. This has resulted in severe infrastructure damage, heightened health risks from waterborne diseases, and economic pressures due to recurring property losses. Conventional static buildings are ill-suited to these conditions. Adaptive architecture, such as kinetic structures that elevate or shift and amphibious designs that float during floods, offers innovative solutions to enhance resilience. These approaches reduce dependency on emergency responses while empowering communities to sustainably withstand future flood events.
research questions and	What architectural solutions can be designed to mitigate the impacts of overspill flooding in the pre-urban areas of Sylhet, to enhancing resilience and self-reliance for local communities?
design assignment in which these result.	Housing project in Sylhet, Shonatola, Bangladesh.

Process

Method description

This study employs an integrated methodology combining theoretical and empirical approaches to develop adaptive design principles for kinetic and amphibious architecture addressing Sylhet's flood challenges. A literature review establishes a foundation, exploring socio-environmental vulnerabilities and global strategies, such as buoyancy mechanisms, to evaluate their relevance to Sylhet's context. Case studies analyze high- and low-tech solutions, like floating homes in the Netherlands and Southeast Asia, to extract adaptable principles suitable for local conditions. Comparative analysis systematically evaluates resilience, cost, and cultural compatibility, identifying scalable solutions. Semi-structured interviews with residents provide empirical insights into community needs, preferences, and barriers to implementation. Together, these methods offer actionable, context-sensitive, and community-centered recommendations that enhance resilience, self-reliance, and scalability for Sylhet and similar flood-prone regions

Literature and general practical references

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Anik, S. I., & Khan, M. A. S. A. (2012). Climate change adaptation through local knowledge in the north eastern region of Bangladesh. Mitigation And Adaptation Strategies For Global Change, 17(8), 879–896. https://doi.org/10.1007/s11027-011-9350-6

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Sakib, M. S., Alam, S., Shampa, N., Murshed, S. B., Kirtunia, R., Mondal, M. S., & Chowdhury, A. I. A. (2023). Impact of Urbanization on Pluvial Flooding: Insights from a Fast Growing Megacity, Dhaka. Water, 15(21), 3834. https://doi.org/10.3390/w15213834

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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)?

My thesis topic focuses on affordable housing solutions within the context of the Bangladesh Delta, specifically addressing the challenges of global housing in vulnerable regions. This aligns closely with the study topic of the Dwelling graduation studio: Global Housing, which explores innovative approaches to housing that respond to social, economic, and environmental challenges on a global scale.

The connection between my thesis topic and my master's track, Architecture (A), lies in the emphasis on designing thoughtful and adaptable architectural solutions. Architecture enables me to approach the complexities of affordable housing by integrating spatial, technical, and contextual considerations into functional and sustainable designs. This synergy is vital in addressing the unique housing needs of communities in flood-prone areas like the Bangladesh Delta.

At a broader level, my thesis contributes to the objectives of the MSc Architecture, Urbanism, and Building Sciences programme by addressing interdisciplinary challenges in the built environment. By combining architectural design with insights from urbanism and building sciences, my research explores how affordable housing can be reimagined to enhance resilience and equity, advancing the programme's goal of tackling global challenges through innovative, context-sensitive solutions.

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

Flooding poses a severe and growing challenge worldwide, affecting millions of people annually by disrupting livelihoods, damaging infrastructure, and straining local economies. Amphibious and kinetic architectural solutions have emerged as viable,

adaptive strategies to mitigate flood risk, providing buildings that can either move or rise with water levels, thereby minimizing flood damage and enhancing resilience. As these approaches gain traction globally, regions prone to flooding, such as Bangladesh, offer a valuable context for exploring the efficacy of such designs. Bangladesh, particularly its Sylhet region, is frequently impacted by extreme weather events that result in overspill flooding, leading to widespread displacement and socioeconomic disruption.

This research aims to explore how kinetic and amphibious architectural solutions can specifically benefit pre-urban communities in Sylhet, enhancing their resilience and self-reliance in the face of recurrent floods. By examining globally implemented strategies and adapting them to Sylhet's unique environmental and cultural landscape, this study addresses critical flood challenges and presents sustainable, community-centric design models that support continuous habitation and recovery post-flooding. This research holds potential not only for Sylhet but also as a blueprint for other vulnerable regions in the global south, fostering adaptive architectural solutions as essential tools in the broader spectrum of disaster risk reduction.