

Graduation Plan

Master of Science Architecture, Urbanism & Building Sciences

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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	Sascha Albada Jelgersma	
Student number	5459397	
Studio		
Name / Theme	(AR3AD105) Dwelling graduation studio: Global Housing	
Main mentor	Dirk van Gameren	Professor of Dwelling
Second mentor	M. J. Smit	PhD local biobased building
Argumentation of choice of the studio	The Bangladesh-based global housing graduation studio redefines housing by addressing complex issues beyond the Western context, focusing on low-income housing in the Global South. Emphasizing inclusivity, the studio creates housing solutions that enrich daily life, respect local culture, and contribute positively to interior and exterior spaces. Amid the global housing crisis, there's a heightened demand for adaptable typologies that provide shelter and a sense of place. The studio explores housing identity through diverse cultural lenses, recognizing the need to reevaluate existing typologies for specific regional and socio-economic conditions. Future housing design requires critical analysis, understanding inhabitant needs, and promoting sustainable construction practices.	
Graduation project		
Title of the graduation project	Beyond the ripple: A Holistic Approach to Flood-Resilient, Trauma-Healing, and Low-Cost Housing Design	
Goal		
Location:	Tanguar Haor, sylhet, Bangladesh	

The posed problem,

In northeastern Bangladesh, the Tanguar Haor, an expansive wetland spanning 9727 hectares, faces annual flooding challenges exacerbated by its unique topographical features and susceptibility to flash floods triggered by rivers during the pre-monsoon period (Muhammad Mizanur Rahaman et al., 2016). The region, integral to the Surma-Kushiyara river basins, is particularly vulnerable to climate change due to its geographical setting, dense population, and prevalent poverty. Despite these recurrent challenges, the socioeconomically marginalized inhabitants, reliant on agriculture, demonstrate resilience by navigating the delicate balance between the adversities and sustenance provided by the waterlogged landscape (Pulla & Das, 2015).

Amidst these challenges, children emerge as the most vulnerable demographic, suffering physical, emotional, and mental distress during natural disasters, particularly floods. Beyond the provision of basic necessities, addressing children's needs demands holistic support, encompassing emotional, mental, and social development (ISDR, 1973). The vulnerabilities faced by children during floods include psychological, physical, and educational dimensions, leading to emotional distress, fear of hunger, loss of educational opportunities, restricted freedom, and heightened risk of physical and sexual abuse (Peek, 2008). Drowning becomes a critical risk during floods, with over 90% of deaths reported in 2007 being children under the age of 5. Families often delay seeking refuge, exposing children to water-borne diseases and a lack of psychosocial support, contributing to the long-term neglect of their emotional and mental well-being (Martin, 2010). Recognizing and addressing the comprehensive needs of children during and after floods are essential steps in fostering resilience and ensuring the well-being of the next generation in the face of adversity.

research questions and

How can design create a safer living environment and mitigate the impact of trauma due to floods among the children in the Tanguar Haor region?

A. What are the ways in which children can cope with trauma stemming from natural disasters like floods?

B. How are the daily lives of children in the Tanguar Haor region affected during floods?

C. How can housing design be employed to establish a safer living environment in relation to floods for children in the Tanguar Haor region?

design assignment in which these result.

The research initiative strives to transform low-cost housing in Bangladesh's Tanguar Haor region by integrating flood resilience and cultural congruence. The primary goal is to create a housing paradigm that not only safeguards residents from floods but also reflects the community's cultural identity. Targeting the most vulnerable residents, children, the housing model seeks to empower individuals and communities by providing the means to build a secure environment.

The assignment spans various scales, from individual dwellings to community clusters, courtyards, and the neighborhood at large. The envisioned outcome is an inclusive ecosystem with shared resources, adaptability, and a focus on diverse user needs. Importantly, building practices leverage the community's skills, making residents the primary construction agents, ensuring economic viability, and fostering a sense of ownership.

The ultimate aim is to establish a network of flood-resilient dwellings promoting inclusive living rooted in cultural identity. The research synthesizes soft and hard data, offering a nuanced understanding of the Tanguar Haor region. This wealth of information serves as a foundation for implementing low-cost housing interventions that balance permanence and a strong sense of place. The culmination of this research promises a transformative era in housing design, harmonizing resilience, healing trauma, culture, and affordability in a uniquely impactful manner.

[This should be formulated in such a way that the graduation project can answer these questions.

The definition of the problem has to be significant to a clearly defined area of research and design.]

Process

Method description

The comprehensive research initiative addressing the impact of natural disasters on children and flood resilience in the Tanguar Haor region employs a diverse methodology to ensure a nuanced understanding. Literary research serves as a pivotal foundation, providing insights into post-disaster trauma in children through reliable essays, books, news, and journal articles. This literature also informs the imperative for enhancing flood resilience in housing.

Mapping research contributes significantly by offering a contextual analysis of the project site, emphasizing the daily lives of children before and after floods. Utilizing visualization methods such as modeling, photography, mapping, and drawing, it reveals pre-existing housing conditions and the unique needs of children during floods, providing a visual understanding of socio-spatial dynamics.

Case study analysis becomes a valuable tool for scrutinizing effective precedents in flood resilience and spaces designed for children's trauma coping mechanisms. Examining and contrasting these cases reveal innovative strategies and lessons learned, synthesizing best practices for the research context.

Field research, the cornerstone of the initiative, employs an ethnographic approach to gain firsthand experience in the Tanguar Haor region. Going beyond literature and case studies, this immersive method provides an in-depth analysis of socio-spatial factors influencing flood resilience in low-income settlements. It unveils the community's response to natural disasters, offering a nuanced understanding of challenges faced by children and the broader population.

Literature and general practical references

- Peek, L. (2008). Children and Disasters: Understanding Vulnerability, Developing Capacities, and Promoting Resilience – An Introduction. *Children, Youth and Environments*, 18(1), 1–29. <https://doi.org/10.1353/cye.2008.0052>
- Khan, M., Rana, S., Zakiul Islam, M., Rahman, T., & Marmot, A. (2020). *Places for displaced children: Improving children's experience of place in temporary settlements*. University College London. Retrieved October 11, 2023, from https://www.researchgate.net/publication/349143270_Places_for_displaced_children_Improving_children%27s_experience_of_place_in_temporary_settlements
- Nijhof, S. L., Vinkers, C. H., Van Geelen, S. M., Duijff, S. N., Achterberg, E. J. M., Van Der Net, J., Veltkamp, R. C., Grootenhuis, M. A., Van De Putte, E. M., Hillegers, M. H. J., Van Der Brug, A. W., Wierenga, C. J., Benders, M. J. N. L., Engels, R. C. M. E., Van Der Ent, C. K., Vanderschuren, L. J. M. J., & Lesscher, H. M. B. (2018). Healthy play, better coping: The importance of play for the development of children in health and disease. *Neuroscience & Biobehavioral Reviews*, 95, 421–429. <https://doi.org/10.1016/j.neubiorev.2018.09.024>
- Mia, M. (2022). Equal Access to Primary Education In Environmentally Challenged Area Of Bangladesh: A Study Into the Tanguar Haor Of Sunamganj District. *Social Sciences Review (Dhaka)*, 38(1), 175–202. <https://doi.org/10.3329/ssr.v38i1.56530>
- Ahmed, K. I. (2005). *Handbook on Design and Construction of Housing for Flood-prone Rural Areas of Bangladesh*.
- Das, S., & Mukhopadhyay, P. (2018). Multi-hazard disaster resilient housing with bamboo-based system. *Procedia Engineering*, 212, 937–945. <https://doi.org/10.1016/j.proeng.2018.01.121>
- Tran, T. A. (2016). Developing disaster resilient housing in Vietnam: challenges and solutions. In Springer eBooks. <https://doi.org/10.1007/978-3-319-26743-2>

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)?

The graduation project focuses on the urgent challenge of low-cost housing, delving beyond economic considerations into complex social dimensions like cultural norms, societal values, and climate adaptability. Addressing the global housing crisis, inclusivity, and advancements in building science, the project recognizes the multifaceted nature of the issue, necessitating a nuanced understanding of the connections between design, society, and the environment. Aligned with the theme of approaching the built environment with resolve for a timeless and enriched future, the program commits to addressing current issues. Studios, offering varied experimentation and technical complexity, seek to synthesize insights shaping a better-built landscape. The project, studio, and track collectively strive to explore new perspectives in dwelling design, contributing innovative, responsible, and forward-looking solutions to the discourse on building a sustainable, inclusive, and resilient future.

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

This urgent research addresses the global imperative of ensuring a safe living environment in the face of escalating natural disasters, particularly floods, exacerbated by climate change. Climate models predict a twofold increase in the frequency of 100-year floods across 40% of the globe by 2050, impacting millions of individuals and vast cropland. The surge in global flood risk demands immediate and effective climate change mitigation measures.

The research proposes a sustainable strategy transcending geographical boundaries, specifically tailored to the Tanguar region while serving as a blueprint for global implementation. While existing literature explores flood resilience and post-flood trauma coping, a critical gap exists in integrated design approaches, particularly in Bangladesh. This research aims to fill this void by introducing an innovative strategy encompassing flood resilience, climate change adaptation, affordable housing, and public space—a holistic solution for vulnerable communities.

At its core, the thesis leverages architecture and urban design research to confront challenges associated with flood resilience and trauma, focusing on the socio-spatial relationship between people and their environment. By redefining this relationship, the research seeks to formulate solutions that enhance both physical infrastructure and the psychological well-being of flood-affected communities. In conclusion, this research provides a guiding beacon towards a future where communities, starting with the Tanguar region, can withstand the increasing threat of floods through an integrated design approach and a focus on socio-spatial dynamics, offering insights applicable globally.