

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	Else Wintermans
Student number	4729455

Studio		
Name / Theme	AR3AE100 Architectural Engineering	
Main mentor	Thomas Offermans	Design Tutor
Second mentor	Jos de Krieger	Research Tutor
Argumentation of choice of the studio	The studio offers a unique opportunity to engage with pressing global challenges. Climate change and resource depletion are issues that affect us all. As an architect, you can be part of the solution by understanding how architectural design can directly impact these challenges. I find the studio's focus on addressing environmental and social issues through technology particularly intriguing. Furthermore, this studio allows for a significant degree of flexibility, enabling you to select your own subject and context based on your personal interests.	

Graduation project	
Title of the graduation project	Balancing Act on Thai Island Paradise Koh Samui Addressing overtourism, water scarcity and tradition
Goal	
Location:	Koh Samui, Thailand
The posed problem, research questions and design assignment in which these result.	[01 Problem Statement]
	[02 Research Question]
	[03 Design Assignment]
<p>01 Problem Statement</p> <p>In recent decades the tourism industry has undergone significant economic growth, leading to the concentration of tourist flows to specific areas, causing crowding and problems with carrying capacity. Tourism is increasingly contributing to local and seasonal pressures on water supply systems, placing an additional burden on local water reserves, especially in areas already sensitive to water scarcity such as (semi-)arid and remote regions like islands. Numerous Thai islands, reliant on tourism as their main industry, encounter challenges associated with water scarcity. The problem arises during a period of low rainfall coinciding with the peak tourist season</p>	

and is worsened by improper wastewater management because the islands' local water treatment plant lacks the capacity to handle the generated wastewater volume. Consequently, untreated wastewater is discharged into the sea, contributing to the pollution of both the seawater and the groundwater. This research aims to develop a strategy for enhancing and promoting sustainability in existing water systems on Thai islands, with a focus on Koh Samui. The outcomes at different scales will inform the design, emphasizing water as a central and unifying element.

02 Research Question

"How can the current water system on Thai islands be sustainably improved to address shortages and pollution while balancing local community needs and tourism demands?"

Sub Questions:

1. How did the traditional water management techniques in Thailand function before the emergence of overtourism?
2. What is the existing balance between water supply and demand, particularly during peak tourist seasons?
3. Which methods and techniques can be (re)applied to improve the current water system and mitigate the challenges arising from overtourism?
4. How can these methods and technologies be integrated into the existing Thai water system to ensure sustainable water resource management in tourist destinations?

03 Design Assignment

The thematic research lays the foundation for the design challenge, where water strategies identified in the study at the individual unit level will be integrated into the design. The assignment involves creating a new concept resort focused on establishing a balancing relationship between tourists and locals, allowing locals to benefit from tourism. The resort centers around achieving a balance in both the relationship between tourists and locals and the water needs. The goal is to reintegrate the Thai culture, which has been diminished due to overtourism, as much as possible into the design. Therefore the architecture will be based on traditional Thai construction techniques, and materials will be sourced locally. A key element of the design is the Thai cooking class, where locals teach tourists to cook Thai dishes. Within the resort, dedicated crops resistant to brackish water will be harvested for these classes. Additionally, there will be a saltwater pool instead of a regular pool to reduce pressure on the freshwater system. On-site wastewater processing will also be implemented and used for irrigation, toilet flushing, etc. The emphasis is placed on making applied water strategies visible, thereby bringing them to people's attention, whether consciously or subconsciously.

Process

Method description

The thematic research distinguishes between a general section, where sustainable strategies are found to enhance existing water systems on islands, and a section where these findings are applied to a specific context. In the general section a set of measures is established through literature review. Subsequently, success factors and failure factors are delineated for each measure, which are then weighed against each other to select the options with the highest success rates for each island. This set of measures, along with integrated success and failure factors, is compiled into an Excel tool. Factors can be assessed in the value sheet, resulting in a spider diagram with a score, making it applicable to multiple islands. As a result, this tool is applied to a particular island, namely Koh Samui. The current water system of Koh Samui is examined and mapped through literature review and a material flow analysis. Subsequently, the tool is utilized, and the most efficient measures identified are integrated into the existing system, then mapped again using a material flow diagram.

For the design research, a site visit is scheduled after P2, during which a research will be conducted into local materials, water systems, traditional architecture, norms, and values of the locals, etc. This information will be obtained through field research and discussions with as many stakeholders as possible. The outcomes of this research will serve as the foundation for the design task.

Literature and general practical preference

1. Beutick, E., & Breure, W. (2016). Project Koh Tao [Masterscriptie]. Technical University Delft.
2. Board, J. (2023, September 30th). IN FOCUS: "We are in a crisis right now" - Koh Samui enduring severe water shortages as tourism demand booms. CNA. <https://www.channelnewsasia.com/sustainability/thailand-koh-samui-island-water-shortage-tourism-sustainability-3752681>
3. Butler, R. W., & Dodds, R. (2022). Island Tourism: Vulnerable or Resistant to Overtourism? *Highlights of Sustainability*, 1(2), 54–64. <https://doi.org/10.54175/hsustain1020005>
4. Fathy, I., Ahmed, A., & Abd-Elhamid, H. F. (2021). Integrated management of surface water and groundwater to mitigate flood risks and water scarcity in arid and semi-arid regions. *Journal of Flood Risk Management*, 14(3). <https://doi.org/10.1111/jfr3.12720>
5. Hophmayer-Tokich, S., & Kadiman, T. (2006). Water management on islands—Common issues and possible actions. In Concept paper in preparation to the international workshop: Capacity building in water management for sustainable tourism on islands.
6. Tzanakakis, V. A., Angelakis, A. N., Paranychianakis, N. V., Dialynas, Y. G., & Tchobanoglous, G. (2020). Challenges and opportunities for sustainable

management of water resources in the Island of Crete, Greece. *Water*, 12(6), 1538.
<https://doi.org/10.3390/w12061538>

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)?

For my graduation project, I aim to develop a resort concept that not only serves as a potential model but also sets a precedent for future projects that contribute to the well-being of local communities in need. I believe in the impact of architecture, as it has the potential to shape spaces that inspire and cultivate a profound sense of connection and enjoyment. Presently, the challenges faced by both locals and tourists, such as resource depletion, waste, and water pollution, highlight the pressing need for innovative solutions. Through architecture and technical interventions, my goal is to address issues like water scarcity, creating a harmonious atmosphere for both locals and tourists. This topic aligns well with my personal beliefs and the reasons behind choosing this master's track. In relation to the studio topic, the technical aspect of integrating established water strategies into the design will be a key focus. Throughout the design research, I will explore how design can effectively communicate and visualize water-related issues to consumers.

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

The main design goal aims to create a balanced and sustainable coexistence between local communities and tourists, addressing and alleviating tensions linked with overtourism to foster a more harmonious environment, benefiting both locals and tourists. This social objective is accompanied by technical aspects focused on mitigating the ecological impacts of excessive tourist activities, contributing to the long-term preservation of natural environments. The design challenge holds societal value by creatively addressing water scarcity and promoting sustainable tourism, potentially serving as an inspiring model for other architects.