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	Christina Elisavet Soentiono
Student number	5840570

Studio		
Name / Theme	Global Housing Design Architecture of Transition in the Bangladesh Delta	
Main mentor	Nelson Mota	Architecture
Second mentor	Ludovica Cassina	Architecture
Professor	Marina Tabassum	Architecture
Research mentor	Antonio Paoletti	Architecture
Argumentation of choice of the studio	**Choice of Studio** - As creatives we have the innate ability to redefine the meaning of architecture and the crucial role it plays in our daily lives. As such, when TU Delft brought forth the opportunity to firsthand explore the landscape of Bangladesh and its people's way of life, a life that is so vastly different from our own, it was a choice that ultimately would not only enrich my perspective on life but would be an unparalleled learning opportunity in my architectural journey. **Choice of Topic -** The graduation studio - Global Housing Design Architecture of Transition in the Bangladesh Delta, invites students to discuss how the growing call for climate action in society affects the field of architecture, and what are the tangible and visual consequences stemming from these calls, specifically in relation to the landscape of Bangladesh. The threats posed by the ongoing human induced climate crisis are feared globally, as the rise in temperatures and sea levels threatens 90% of all major	

	coastal cities. Bangladesh was remarked as one of four countries severely threatened by rising sea levels by the United Nations due to the country's low-lying elevation. As such, my interest in the studio lies on the prototyping of an amphibious housing solution for the vulnerable urban environments of Bangladesh. My hope for the studio and basis for my choice, was the aim to research and produce a prototype of an amphibious solution that could assist in the research conducted for the typologies implementation globally as our society seeks to provide aid to endangered communities.

Graduation project	
Title of the graduation project	Built on Shape Shifting Land – A Transition towards Floating Cities
Goal	
Location:	Sylhet, Bangladesh
The Posed Problem	In the north-eastern part of the country, the city of Sylhet was established in 1867 and is known to many as the spiritual capital of the country of Bangladesh. The city is located near the Haor Basin, a large saucer-shaped floodplain with an area of around 113km undergoing persistent subsidence as the rivers erode the fertile soil. The city has sunk in some areas by 12m over the past 200 years and continues to sink today. The city today is a large, metropolitan environment with a population of almost one million people. The population continues to increase at a rate of 3.64% per year, resulting in large groups of people in sub-standard housing and in acute danger during the monsoon floods due to their settlement in low-lying areas of the city. Like many cities within Bangladesh, the city of Sylhet stands out as a climate change hot spot due to its unique geography, high population density as well as its limited capacity for

	adaptation. In more recent years, the effects of climate change have been felt in the disruption of this natural pattern, with severe droughts followed by frequent extreme events of rain and flash floods, destroying property and crops in its wake. In 2020, Sylhet faced flash flooding that directly affected thousands, with thousands more still recovering from the longer-term impacts. The unforgiving disaster swept away homes, belongings and livelihoods, with over a quarter of the country flooded during that monsoon season. According to the Flood Forecasting and Warning center, approximately 84% of Sylhet districts were submerged during the floods, forcing the population to flee their homes in search of dry land. The flash floods left 482,000 people displaced and 83,394 acres of cropland damaged and 135,770 homes destroyed in the region of Sylhet. The unique landscape of Bangladesh exposes the nation to severe threats posed by the ongoing climate crisis. Scientific data predicts that portions of Bangladesh, including the city of Sylhet will be underwater by the year 2050, with the rest of the country facing constant threats from flash flooding events. **Therefore, our attention must turn to supporting nations such as Bangladesh in addressing this impending existential threat to their existence.**
Research Questions	With the number of people displaced as a result of climate change climbing to 40.5 million by 2050, the United Nations predicts 19 million will originate from Bangladesh due to the extreme low elevation of the major population centers in the country. The threat posed to vulnerable populations

	requires innovative solutions, otherwise mass migration from low lying areas could overwhelm the infrastructure of higher altitude areas. The concept of amphibious living could provide such a solution. **How can the development of amphibious housing solutions for vulnerable urban environments such as Sylhet act as the foundation and key driver for the transition towards floating cities as a viable response to climate change.**
Design Assignment in which these result.	**Transition towards Floating Cities** The project aims to provide viable solutions for transitioning vulnerable urban environments towards floating cities. The project is located within the Shonatola community in the rural areas of Sylhet, Bangladesh. **The project is composed of two separate components the prototype and the upgrading.** The prototype proposal aims to imagine how an amphibious community could take shape within the open farmlands of Bangladesh. While providing housing for the mass urbanization taking place in the region, the proposal aims to respect and maintain the current way of life of the surrounding communities. The upgrading proposal will look into taking the existing structures within the Shonatola village and modifying them in order to obtain amphibious qualities, so that they are able to withstand the climatic threats of today and the future. Overall, the aim of the proposal is to not only provide viable solutions for

	the construction of new amphibious housing typologies that can be implemented through out Bangladesh and other endangered communities around the globe, but also provide solutions for existing communities to upgrade their current housing conditions to be better equipped for the threats they face.

[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 research aims to provide viable solutions to combating and mitigating the impact of global climate change to threatened urban environments such as Sylhet. The research seeks to understand and analyze several pieces of information vital to the viability of the design and execution of floating cities.

Several forms of analysis will be conducted to reach a thorough and comprehensive analysis of the topic at hand.

01. Data Collection

This phase of the research will primarily be conducted during the planned excursion in Dhaka and Sylhet by incorporating several methods.

A conversation with individuals from a range of age groups will be initiated, in hopes of understanding their current housing needs. Residents will be asked to describe the successes and shortcomings with their current housing situations as well as what can be modified to improve their quality of life.

A conversation with individuals who identify themselves as farmers or fisherman will be initiated, in hopes to understand their current situations and techniques in terms of protecting their crops and livestock during flooding. This is essential to the planning and designing process to ensure the ability to create and self-maintain the inhabitants of the floating city.

A photographic report will also be created in order to document and present the current housing provided to the residents of Sylhet. As well as conducting photographic research on the impacts of and disruption caused by the heavy rainfall.

A mapping exercise will be conducted in order to visualize the changes in Bangladesh's landscape throughout its existence. Mapping of Bangladesh's terrain throughout its existence, for further understanding of the changes that have occurred over time.

Mapping tools will be used for predictions of the percentage of Bangladesh that will be underwater by 2050 in three different scenarios - mild, moderate and extreme rising sea levels.

02. Literature Reviews

A series of literature will be reviewed to provide objective evidence for the basis of the design interventions. Analysis of a series of articles, reports and interviews regarding global climate change and rising tides.

03. Case Studies

A series of case studies will be analyzed of current and passed ideations of floating cities. The hope is to further understand their successes and shortcomings to assist with the design process.

Triton City	Buckmister Fuller
Vision for Tokyo	Kenzo Tange
Oceanix	BIG and United Nations
Floating Farm	Goldsmith Company
Maldives Floating City	DutchDocklands
Floating office	William Alexander

04. Deconstruction Process

The process involves the envisioning of the ultimate outcome, this process allows for the meticulous charting of a path towards that goal. The process allows for the project's capabilities and success metrics to be defined upfront, as such steering the development of the project with precision.

Literature and general practical references

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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)?

The relationship between my graduation project "Built on Shape Shifting Land – A Transition towards Floating Cities" aligns with the thematic focus of the Global Housing Studio towards an architectural response to the pressing environmental crisis in the region of Bangladesh, highlighting inventive solutions, novel materials, and fresh approaches to designing architecture and urban environments.

Furthermore, the proposal aligns with the goals set forth by Architecture master track of the MSc Architecture, Architecture, Urbanism and Building Sciences as a programme that encourages students to explore innovative ways to create more sustainable development.

The proposal aims to make a significant contribution to the progress of topics relating to amphibious architecture while promoting sustainable and inclusive living environments. The proposal aims to not only provide a viable solution to mitigating the threats posed on urban environments in Sylhet, but to contribute to the collective knowledge base within and beyond the TU Delft community in hopes of enhancing the global urban strategy towards floating cities and the upgrading of structures in response to the ongoing climate crisis.

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

The aim of the graduation project is to provide a viable prototype for the transition towards floating cities amidst the ongoing global climate threats. The world will drastically change by the year 2050, as our planet continues to warm up rapidly and sea levels continue to rise as a response.

Scientific data predicts that approximately 40 million people around the world will be labelled as climate refugees based on our current projections. Although the final design will be curated to meet the current needs of Sylhets communities in all its aspects of social, economic and cultural landscapes, the aim of the design is to be anchored on a base prototype that could be adjusted to serve any community in imminent threat around the world. **It is my hope that the research conducted within my graduation project can aid towards a vital solution for those displaced due to the human induced climate crisis around the world.**