

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:

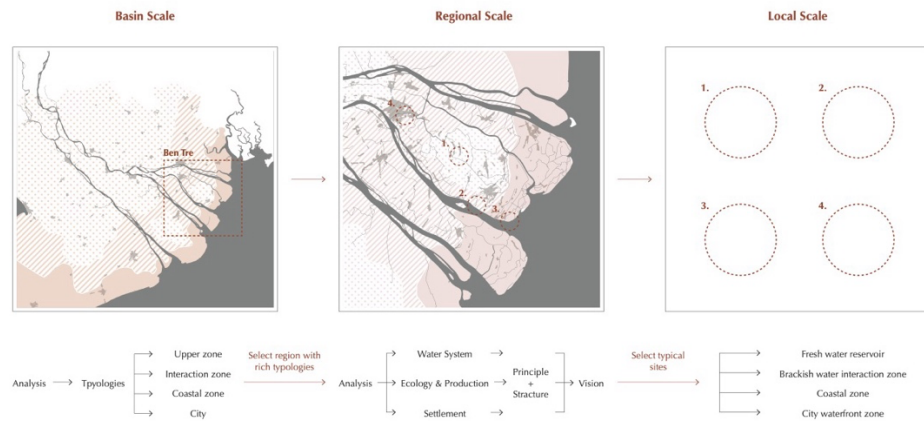
Personal information	
Name	Hao Wang
Student number	5792584

Studio		
Name / Theme	Design Resilient Coastal Landscapes	
Main mentor	Steffen Nijhuis	Landscape Architecture
Second mentor	Geert van der Meulen	Urbanism
Argumentation of choice of the studio	Through my previous studies I have realized that in the context of climate change, water is both a resource we depend on for our survival and at the same time poses a lot of problems in our lives, and how to balance and harmonize the relationship between people and water is a very important issue. As a landscape designer, I realize that landscape has great potential to address this issue, so I chose this studio to further explore how to use landscape methods to build resilient systems to achieve harmony between people and water.	

Graduation project	
Title of the graduation project	"Hydro-Harmony" Establishing A Resilient Landscape System For The Mekong Delta, To Achieve the Harmonious Co-Existence Of Humans And Water
Goal	
Location:	Mekong Delta, Vietnam
The posed problem,	<p>People are fighting against the water.</p> <ol style="list-style-type: none"> 1. Rigid water management engineering ignores the potential of the landscape, destroys ecosystems, and exacerbates water problems. 2. Serious water issues have led to significant reductions in agricultural and aquaculture yields while causing great inconvenience to people's lives. 3. In the context of climate change, more water management facilities are being built and more serious water problems are arising. <p>Over the years, the landscape of the Mekong Delta has been dramatically altered to maintain the existing patterns of production and life. When production conflicts with the natural functioning of water, a</p>

	<p>series of rigid water management techniques such as sluice gates, seawalls, river dykes, wells, etc. have been used in an attempt to control and utilize the water. However, these methods have exacerbated problems such as saline intrusion, flooding, aquifer drawdown, etc., which have had a significant negative impact on people's livelihoods. As a result, people are looking for additional water management infrastructure to solve the problems. This creates a vicious circle between people and water, exacerbating the conflict between people and water. At the same time, in the context of climate change, this vicious circle is exacerbated by a climate of uncertainty.</p> <p>In fact, the landscape, as the base of all things, has the potential to mitigate water problems in its own right. For example, using brackish water to develop natural communities, storing excess pure water, backfilling groundwater, and so on. When these potentials are realized and a landscape approach is applied at the water management level as an alternative to rigid models, based on which production practices and forms of habitation can be adjusted, more resilient landscape systems can be constructed to mitigate water problems and even to respond to climate change.</p>
<p>research questions and</p>	<p>Research Objective</p> <p>"To contribute to a resilient system for the Mekong Delta through exploring design oriented landscape approaches to realize the harmonious coexistence of people and water."</p> <p>Research Question</p> <p>Sub-question1 What is the relation between the landscape context and the environmental and spatial challenges? and what are the potentials to address them?</p> <p>Sub-question2 What strategies and principles can be employed in terms of water management, production, settlement, and ecological perspectives?</p> <p>Sub-question3 How to apply resilient design principles across scales?</p>

design assignment in which these result.



Basin scale

Analyse the current situation and issues and categorise the sites into three different types.

Regional scale

Select the area with the richest typology in the basin scale, further analyse the site from three perspectives - water system, ecology and production, and settlement - in layers, and propose design principles and plan the landscape structure accordingly.

Local scale

Select typical sites within the regional scale for specific landscape design, combining and utilising the design principles from each perspective.

Process

Method description

Sub-question1 Understanding

What is the relation between the landscape context and the environmental and spatial challenges? and what are the potentials to address them?

- **Mapping**

Gain a deeper understanding of the landscape characteristics and categorise the types by making structural maps. At the same time, problems and landscape potentials are localised by making a map of challenges and potentials.

- **Layer approach**

The landscape is analysed systematically in three layers: water systems, ecology and production practices and settlements.

- **Design through scales**

Landscape characteristics are analysed and categorised in a cross-scale approach, so that sites with clear and rich characteristics can be selected to zoom in for deeper study.

Sub-question2 Poteneials

What strategies and principles can be employed in terms of water management,

production, settlement, and ecological perspectives?

- **Case study**
Research river management, eco-agriculture, mangrove restoration and other relevant case studies, and extract design principles that can be applied to design
- **Traditional wisdom**
Study the local traditional production methods and settlement patterns that fit the landscape, extract the parts that can be applied to the current situation, and summarise them into design principles.
- **Literature review**
Read articles on water management, eco-agriculture and distil design principles from them.

Sub-question3 Application

How to apply resilient design principles across scales?

- **Design through scales**
Regional scale sites with a rich variety of landscape typologies are planned and typical local scale sites are designed. The design results and can be applied at the regional scale and projected to the entire basin scale.
- **Mapping**
Use mapping to show the plan for region scale in different layers, and the whole vision after plan.
- **Scenario design**
As landscapes are developing and changing, design needs to respond to different scenarios. Contexts such as seasonal water level and quality changes, sea level rise, etc. need to be considered and responded to in the design.

Literature and general practical references

[1] Nijhuis, Steffen, et al. Flowscapes. Designing Infrastructure as Landscape . Jan. 2015.

[2] Nijhuis, Steffen & Jauslin, Daniel. (2015). Urban landscape infrastructures. Designing operative landscape structures for the built environment. Research in Urbanism Series. 3. 13-34. 10.7480/rius.3.874.

[3] Espagne E. (ed.), T. Ngo-Duc, M-H. Nguyen, E. Pannier, M-N. Woillez, A. Drogoul, T. P. L. Huynh, T. T. Le, T. T. H. Nguyen, T. T. Nguyen, T. A. Nguyen, F. Thomas, C. Q. Truong, Q. T. Vo, C. T. Vu. 2021. Climate change in Viet Nam; Impacts and adaptation. A COP26 assessment report of the GEMMES Viet Nam project. Paris. Agence Française de Développement.

[4] Stewart, Mart A. and Peter A. Coclanis. "Environmental change and agricultural sustainability in the Mekong Delta." (2011).

[5] International Center for Living Aquatic Resources Management and International Institute of Rural Reconstruction and Food and Agriculture Organization of the United Nations. Integrated agriculture-aquaculture : a primer Food and Agriculture Organization of the United Nations Rome 2001

[6] Dinh, San & Albers, Thorsten & Schmitt, Klaus. (2013). Shoreline Management Guidelines Coastal Protection in the Lower Mekong Delta.

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 landscape architecture track focuses on flowscapes. The Landscape contains many layers such as water, ecology, settlement, production, etc., and the complex interactions between these elements make it resilient and adaptable. Therefore, it has great potential to solve many existing problems. As landscape architects, it is our responsibility to explore the problem-solving potential of the landscape system on its own, based on a full understanding of the system. Through appropriate design, we should provide space for the landscape to fulfill its potential and ensure that it fulfills its social function.

My project focuses on exploring the potential of landscape as a means of mitigating existing problems in the Mekong Delta (salt intrusion, flooding) and responding to global climate change. In the project, I will analyse and design the site at a large scale with different dimensions, and at the same time, apply specific landscape approaches at a smaller scale, paying attention to the spatial perception of the landscape and its function.

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

Landscape as a system is cross-scale, developing as well as resilient. As such, it provides opportunities for the resolution of many problems. At large scales, due to its coherence and developmental nature, we may find that the solution to a problem does not necessarily have to be locally and immediately present, but rather a more moderate and sustainable approach can be chosen. At smaller scales, landscape-based approaches may create a better and more unique spatial experience. Therefore, there is a great potential for landscape-based solutions in urbanization.

In the Mekong Delta, its rigid problem-solving approach has brought many bad effects on its productive life and ecology, and its lives have become more

vulnerable in the context of global climate change. Therefore, in my final project, I will explore a landscape-based approach to enhance the resilience of the landscape system and mitigate the existing problems through research and design across scales and at different levels. At the same time, the elements within this system should develop over time, thus responding to the ongoing climate change.