

# 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](mailto: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	Xiaolei Ma
Student number	5978181

Studio		
Name / Theme	Circular Water Stories, Water management with public participation	
Main mentor	Dr. Inge Bobbink	Landscape Architecture
Second mentor	Dr. Daniele Cannatella	Urban planning
Argumentation of choice of the studio	My fascination with water from the role as both a spatial and cultural connector. Through my academic journey, I've developed a deep interest in exploring water beyond its physicality, seeing it as a medium that shapes and reflects human and environmental interactions.	

Graduation project	
Title of the graduation project	Recalling from waterscape: Public participation as tool for water management through landscape design

Goal	
Location:	Pearl river delta, Guangdong, China
The posed problem,	<p>The Pearl River Delta, once a flooding river delta, has gradually become an important residential area in Guangdong due to the efforts of laborers who have built and maintained infrastructure for flooding control and management over the past century. With its favorable geographic location and climate, the region developed a paddy agricultural system and later freshwater fisheries based on the dike irrigation system</p> <p>Today, the fishing industry in the Pearl River Delta has become a major industry of Guangdong's economy, with large-scale, intensive, and high-yield practices increasingly dominating the sector. Since 2020, the total fishery output in Guangdong has ranked first in China (Luo, 2020).</p> <p>However, the overdevelopment of intensive fisheries has occupied a large portion of available space, limiting its potential as a resource for water management and open space. In the past, residents' production and living spaces were closely</p>

	<p>integrated. The fishing ponds not only served as flood retention areas protecting residential spaces but also provided productive space, contributing to economic value. In this process, production, daily life, and water management gradually formed an organized landscape, with residents deeply involved, giving rise to a rich water culture. Today, as urbanization accelerated, living spaces and production areas became more and more separated, while water management and water culture gradually lost their connection to daily life.</p> <p>Beyond its role in production, the connection between the people and the landscape has been diminished in this area</p> <p>Fish ponds became overexploited as mere production spaces, which has also created several issues. According to the Opinions on Accelerating the High-Quality Development of Modern Fisheries (General Office of the People's Government of Guangdong Province, 2022), the over intensification of fisheries has led to significant pollution of water, threatening the health of the fisheries industry and food safety. These issues have not attracted sufficient attention from fishery producers and consumers. Field trip reveals that the high rent and production costs force the residents and fishery workers to increase production. In pursuit of higher profits, many fish that do not meet food safety standards are privately sold to local restaurants or markets. Fish that die during the farming process are sold at a low price or used as fertilizer, resulting in toxic and harmful substances that threaten food safety. At the same time, the high rent and production costs partly stem from water management expenses needed to maintain water quality and ensure the stability of the fishery, such as the management fees for water treatment plants and the electricity costs for water pumps.</p> <p>Water is a resource with both physical properties and social value. In the process of water management, it is crucial for both managers and stakeholders to recognize the natural and social values of water and coordinate the relationships across different dimensions (Bakker, 2012). In the Today's Pearl River Delta, the pollution is primarily managed by government authorities, and several measures has been implemented. However, field investigations and interviews shows that these measures have not effectively encouraged participation from local residents and fishery workers, who are the key stakeholders in production.</p> <p>Research shows that enhancing the connection between water management and social relationships helps raise public awareness and responsibility for managing water systems, and raise the feasibility of water management (Sharp, 2017). Facing the urgent need for local economic development and the conflicts</p>
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	<p>with water management, spatial planning based on social participation can serve as an effective tool to promote coordination and sustainable development across multiple systems.</p> <p>Therefore, this study will focus on understanding the complexity of water management issues, recognizing the importance of social participation in water management, and exploring how spatial planning can foster public involvement in water management to achieve balanced development in ecological, economic, managerial, and cultural aspects.</p>
research questions and	<p><b>Main research question:</b></p> <p>How can landscape design foster the integration of economic growth, ecological restoration, and cultural revitalization through the re-engagement of communities in intensive production landscapes</p> <p><b>Sub research questions:</b></p> <p>[1] How has the historical and contemporary relationship between production, living area, and water management systems evolved spatially, and what are the implications for future landscape dynamics?</p> <p>[2] What are the underlying socio-economic and environmental factors that shaped the development and operational logic of intensive production systems, and how have they influenced the current landscape?</p> <p>[3] How can the complex interrelations between water management, production, and economic development be understood, and what are the key points of tension or contradiction among these systems?</p> <p>[4] How does public participation in water management processes contribute to breaking the gaps between local communities, water governance, and sustainable landscape management?</p> <p>[5] How can spatial planning foster meaningful public participation in the management of intensive production landscapes, and what specific tools or scales can facilitate this process?</p>
design assignment	<p>The design is proposing</p> <p>[1] To restore and enhance local communities' understanding of water management systems and fishery production, increase</p>

<p>in which these result.</p>	<p>awareness of issues related to water pollution, water management, and food safety, and foster greater public participation in water governance.</p> <p>[2] To reconstruct the spatial relationships between water management, productive landscapes, and other spatial systems, utilizing spatial planning to establish new industrial models that can mitigate the potential risks and losses imposed by current water management practices in intensive agricultural systems, thereby alleviating the tensions between ecological restoration, economic development, and the health of human settlements.</p> <p>[3] To explore new modes of interaction between human settlement patterns and water systems, in alignment with future development policies, promoting a vision of ecological and productive sustainability, and creating a novel landscape experience that integrates both environmental and social dimensions.</p> <p>The design framework will include</p> <p>[1] Guidelines for water management based on public participation</p> <p>[2] A new industrial system to replace the existing intensive fisheries</p> <p>[3] Industrial development and spatial optimization strategies in the different relationship of land-use within the Pearl River Delta fisheries region</p> <p>[4] Design Experiment: Large-scale development vision, medium-scale spatial planning, and small-scale applications</p> <p>[5] Summary of models: Formulation of a landscape design framework led by public participation</p>
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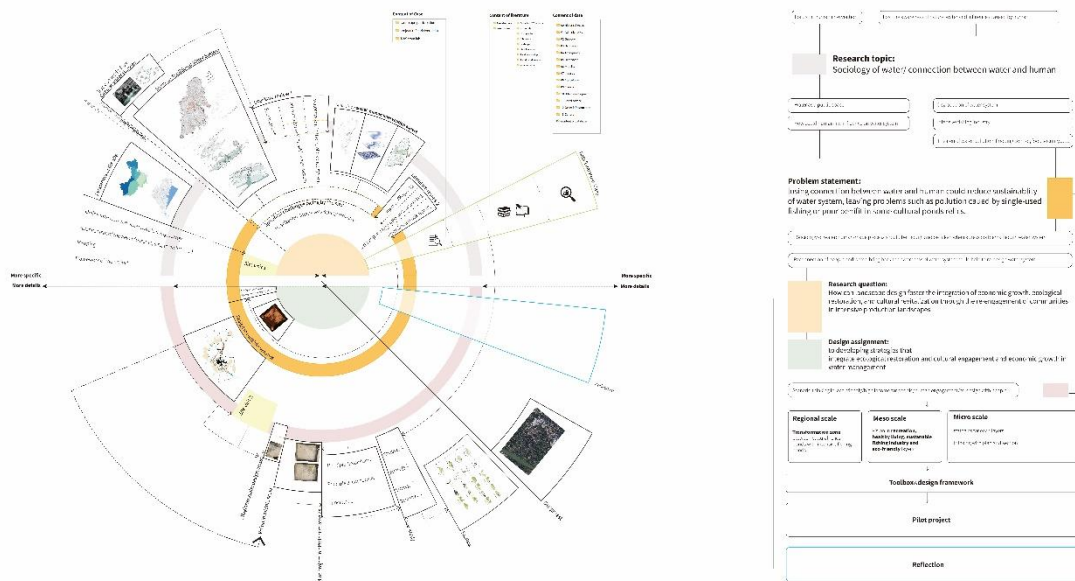
## Process

The process continues with site research and the identification of the research questions. After gathering and analyzing relevant information, the project transitions into the design phase. In this stage, the design process will progressively deepen the understanding of the issues and work toward answering the research questions.

## Method description

The primary research method for this project integrates design and thesis research. The process begins with selecting the site, systematically collecting and organizing data and case studies, and analyzing the site's water systems and other aspects. The research topic evolves from the integration of personal interests with site-specific characteristics. After further analysis and literature review, a conceptual theory and problem statement are developed, leading to the formulation of research questions and hypotheses. Design exercises refine these hypotheses, guiding the development of the design assignment. The project operates on three scales: regional, meso, and micro, with design principles developed at each level. A toolbox will be created, and

1–3 specific sites will serve as pilot projects for design experiments, addressing the research questions.



## Literature and general practical references

### Books:

Sharp, L. (2017). *Reconnecting people and water: Public engagement and sustainable urban water management*. Routledge.

Zhao, S. Q., & Yang, Z. W. (Eds.). (2011). *The history of dike water conservancy and agricultural development in the Pearl River Delta*. Guangdong People's Publishing House.

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Wu, J. X. (2012). *Agricultural environment in Guangdong during the Ming and Qing dynasties: Focusing on the Pearl River Delta*. Guangdong People's Publishing House.

### Papers:

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Schulz, P., & Gros, A. (2024). Toward a Sociology of Water: Reconstructing the Missing "Big Picture" of Social Water Research. *Water*, 16(13), Article 13. <https://doi.org/10.3390/w16131792>

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Wang, C. X., & Huang, S. Y. (2023). Spatial morphological characteristics and historical landscape evolution of Sangyuanwei in the Pearl River Delta. *Landscape Architecture Research*, 10(2), Article 10. <https://doi.org/10.12233/j.gdyl.2023.02.010>

Wu, W. F., Zhang, K. Y., & Xu, Z. L. (2024). Analysis on sandfield landscape characteristics and biocultural diversity in the Pearl River Delta. *South Architecture*, 2024(6), 10–20.

Xiu, Q. (2016). *The research of vernacular landscape of Sangyuan polder* (Master's thesis). Beijing Forestry University.

Yang, D. M. (2024, July 2). The historical origin, current status, and development path of the mulberry-dike fish pond system. *Shanxi Science and Technology Daily*, A06.

Yao, Y. J., & Zhou, J. Y. (2024). Evaluation and management of agricultural landscape characteristics in the alluvial plain of the Pearl River Delta. *Landscape Architecture*, 1, 56–63. <https://doi.org/10.3724/j.fjyl.202307290343>

Zhong, H., Lin, Z., Huang, G., & Wang, M. (2020). Changes and spatial transfer of traditional agricultural landscape in the Pearl River Delta. *Agricultural Archaeology*, 2020(6).

## 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)?

As a landscape architecture student, my graduation project focuses on balancing agricultural development, water management, and ecological stability within intensive production areas in the Pearl River Delta through landscape design. The goal is to create a spatial planning strategy that integrates ecological restoration with economic needs, addressing both water management and human habitat. This project aligns with my studio, "Circular Water Stories," which focuses on the revitalization of traditional water systems and their application in contemporary development. By investigating these systems, I aim to develop adaptive, culturally and ecologically meaningful design strategies that contribute to sustainable development.

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

Landscape architecture holds a critical position at the intersection of ecology, urbanism, and culture, offering unique strategies to restore the fragmented relationship between people and water. By integrating ecological restoration, public engagement, and cultural activation, landscape design has the potential to transform degraded water systems into multifunctional spaces that inspire awareness, education, and action. Water, as Bakker (2012) highlights, is not merely a physical resource but a carrier of social, political, and cultural meaning. Sharp (2017) further emphasizes the role of design in facilitating public participation and sustainable water management, while Campbell (2021) demonstrates how spatial design can stimulate cultural responsibility and reconnection with water systems. Positioned within this framework, landscape architecture redefines water as an ecological asset and a cultural medium, capable of reconnecting communities to their natural environments.

This positioning is particularly relevant in the face of rapid urbanization and technological advancement, which have increasingly disrupted the historical relationship between water and society. Places like the Pearl River Delta exemplify this disconnection. Once characterized by traditional water systems that supported agriculture, flood control, and infrastructure for daily life, the region has made significant transformation due to urban expansion and intensive agricultural practices. These changes have led to the degradation of water systems, increasing issues such as pollution, intensive fishing industry, and ecological imbalance. At the same time, cultural Bakker, K. (2012). *Water: Political, biopolitical, material. Social studies of science*, 42(4), 616-623. Sharp, L. (2017). *Reconnecting people and water: Public engagement and sustainable urban water management*. Routledge. Campbell, M. (2021). *Re-saturated: Toward a Cultural Reconnection with Urban Water*. awareness



of water's importance has eroded, further deepening the disconnection between people and their environment.

In this context, landscape architecture must respond to both ecological degradation and cultural detachment through spatial design. This thesis explores the potential of landscape design to reconnect people and water by restoring degraded systems while creating opportunities for public engagement. In the Pearl River Delta, the research demonstrates how design strategies can transform water systems into active public spaces. These spaces can address ecological challenges such as degradation and pollution while also serving as public platforms for education, community interaction, and cultural revitalization.

By activating the dual role of water—as both an ecological system and a cultural landmark—landscape architecture can reconnect lost relationships and support sustainable development. Through site specific interventions, it becomes possible to restore water systems while redefining their role in contemporary society. Standing at the intersection of space and humanity, landscape architecture can bridge ecological restoration and social engagement, fostering a harmonious relationship between humans and water systems while redefining their cultural and environmental significance.