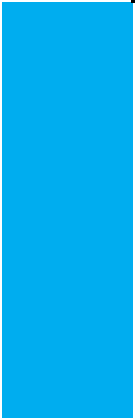


Graduation Plan

Master of Science Architecture, Urbanism & Building Sciences



Graduation Plan: All tracks

The graduation plan consists of at least the following data/segments:

Personal information	
Name	Yayun Gao
Student number	5078024
Telephone number	
E-mail address	
Studio	
Name / Theme	Flowscape Resilient Coastal Landscape
Teachers	Steffen Nijhuis, Taneha Kuzniecowa Bacchin
Argumentation of choice of the studio	<p>As one of the most important and valuable ecosystems on the planet, the coastal zone accommodates a more dense population than the hinterland and faces faster urbanization and higher population growth (Neumann et al.,2015). Meanwhile, the coastal zone is exposed to several climate change disasters in the context of a sensitive environment dominated by water. The coastal zone is considered with limited resources and capacities to respond to stress (Razafindrabe et al.,2009) and those with the least resources and capacities are the most vulnerable(Houghton et al.,2001).</p> <p>The concept of resilience was first proposed by Holling (1973). Nowadays, it refers to the capacity of systems to reorganize and recover from change and disturbance (Ahern, 2011). Under the dramatic climate change, it is important to approach landscape architecture design with resilience thinking. And coastal zones with the dynamic natural process and fast urbanization are valuable locations to study on.</p> <p>The Resilient Coastal Landscape studio could provide me a chance to elaborate on resilience thinking in the coastal zone. And I can explore more about the water-dominant area which is new but attractive to me.</p>
Graduation project	
Title of the graduation project	Colored Water-A Resilient Landscape Framework that Facilitates Water Safety and Batik Development in Pekalongan city.
Goal	
Location:	Pekalongan, Central Java, Indonesia

<p>The posed problem,</p>	<p>Located on northern Java Island, Indonesia, Pekalongan city is facing severe climate change disasters, especially water-related issues. Flash floods, rob floods, seawater intrusion, droughts, freshwater scarcity, and subsidence are common. And they are mainly caused by people's inappropriate intervention. Meanwhile, Pekalongan is famous for the Batik industry which employs 75% of adults in the city and has a huge cultural significance. It could be an excellent example of how culture-based development can support urbanization. But the reality goes against expectations. The traditional way of batik production is highly reliant on natural resources, especially water. The sensitive and unstable water conditions sometimes make batik production impossible, because of lack of water supply or severe flooding. At the same time, 95% of the water used in the production process will be discharged into river systems, mixed with rainwater, without any treatment. The batik industry causes serious water pollution in Pekalongan city.</p> <p>The locals actively fight against natural disasters and try to boom their cultural significance. But the measures were conducted partially. Without understanding the natural process and resilience thinking, the interventions are slightly ineffective, and even could be counterproductive from a long-term perspective.</p> <p>In conclusion, the city is facing serious water safety issues. There is a dilemma between the development of cultural significance and natural resources. The power and potential within landscape and nature are ignored.</p>
<p>research questions and</p>	<p>The research objective is how to develop a resilient landscape framework that could facilitate water safety and cultural batik development in Pekalongan city.</p> <p>And there are five questions follows to address the objective.</p> <ul style="list-style-type: none"> - What is the water safety issue, and the interconnection with the Batik industry? -What does resilience mean for water safety and batik development? -What are the principles to increase water safety? -How to apply the strategy and principles within the cultural and natural conditions of Pekalongan city? -How to generate the spatial potentials in different scales in the terms of landscape view?
<p>design assignment in which these result.</p>	<p>The project aims to develop a resilient landscape framework to facilitate water safety and batik development in Pekalongan city by focusing on the three dominant water-related design assignments, namely are water circulation, discharge capacity, and coastal protection. The result of the design assignment will take place in different scales, strategies planning on the regional scale, and detailed design on a specific location to elaborate on</p>

	<p>three kinds of principles and explore the potential of spatial integration. It also aims to provide some design principles for the area which faces the same problems as Pekalongan city. More specific details as follows:</p> <p>Regional Strategy: Take the water system as the base. Generate a resilient landscape framework that aims at coastal protection, water circulation, and discharge capacity. Make use potential of landscape and build up a system that facilitates natural development and batik industry.</p> <p>Detailed Design: Focus on the downstream area, pick up locations where are valuable to elaborate more on three types of design principles. Experiment with different possibilities and value the system. Detailed designs like floating houses and double-deck river banks.</p> <p>Toolbox: Build a toolbox of principles focus on discharge capacity, coastal resilience, and water circulation.</p>
<p>This should be formulated in such a way that the graduation project can answer these questions.</p> <p>The definition of the problem has to be significant to a clearly defined area of research and design.</p>	

Process

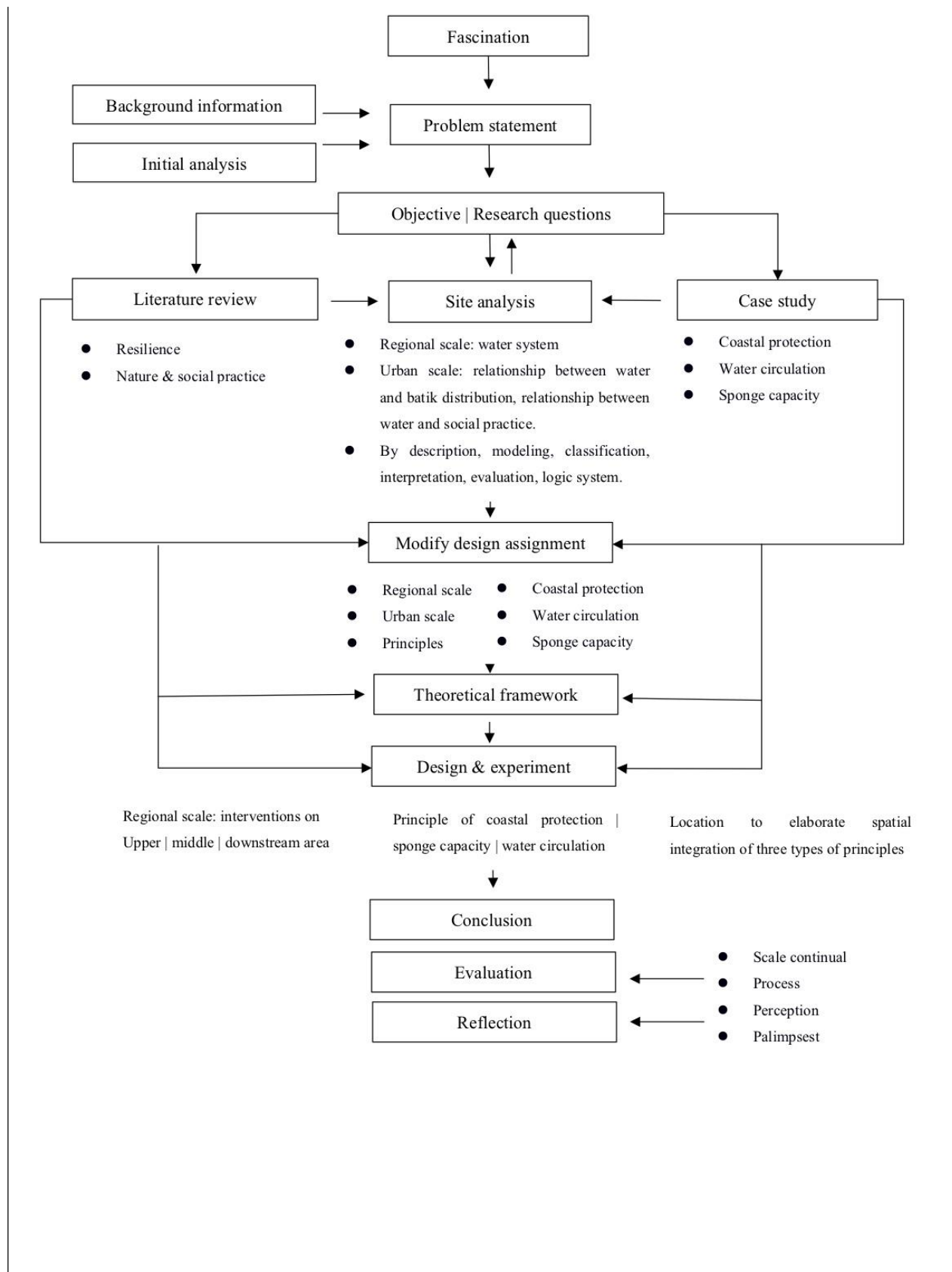
Method description

Process

Landscape approach, research through design, and design by research are the core methods.

By comparing the pattern of urbanization with natural situations in Pekalongan city, it clearly indicates that a lot of problems were caused because people changed the way how nature functions. So it is important to look back at how nature and landscape work as a system and learn from it. In this way, we could find the potentials and conduct design interventions that are more sustainable and resilient. The landscape is the basis for the future. The research process could provide important clues for design while the design process could also help refine research topics. This is a mutually beneficial process.

The research and design process entails the following steps:



Literature and general practical preference

Nijhuis, S., Xiong, L., & Cannatella, D. (2020). Towards a Landscape-based Regional Design Approach for Adaptive Transformation in Urbanizing Deltas. Retrieved January 07, 2021, from <https://doi.org/10.7480/rius.6.94>

Ahern, J. (2011). From fail-safe to safe-to-fail: Sustainability and resilience in the new urban world. *Landscape and Urban Planning*, 100(4), 341-343. doi:10.1016/j.landurbplan.2011.02.021

Holling, C. S. (1973). Resilience and Stability of Ecological Systems. *Annual Review of Ecology and Systematics*, 4(1), 1-23. doi:10.1146/annurev.es.04.110173.000245

Neumann, B., Vafeidis, A. T., Zimmermann, J., & Nicholls, R. J. (2015). Future Coastal Population Growth and Exposure to Sea-Level Rise and Coastal Flooding - A Global Assessment. *Plos One*, 10(3). doi:10.1371/journal.pone.0118571

Razafindrabe, B. H., Parvin, G. A., Surjan, A., Takeuchi, Y., & Shaw, R. (2009). Climate Disaster Resilience: Focus on Coastal Urban Cities in Asia. *Asian Journal of Environment and Disaster Management (AJEDM) - Focusing on Pro-active Risk Reduction in Asia*, 01(01), 101. doi:10.3850/s179392402009000088

Botkin, D. B. (2000). *Discordant harmonies: A new ecology for the twenty-first century*. Bridgewater, NJ: Replica Books.

Walker, B., & Salt, D. (2006). *Resilience thinking sustaining ecosystems and people in a changing world*. Washington: Island Press.

Folke, C. (2016). Resilience (Republished). *Ecology and Society*, 21(4). doi:10.5751/es-09088-210444

Reflection

Relevance

Landscape architecture is an artistic approach to tackle social, technical, and natural challenges. Due to the dramatic natural conditions and dense population, the coastal zone is one of the most vulnerable areas that need to be taken care in both social and natural perspectives. So study the coastal area in terms of landscape perspective could provide all-rounded solutions map nature, social practice as well as infrastructure. Besides resilience thinking is important in landscape architecture as it would enable the system “safe to fail” (Ahern, 2011), which is especially important for the coastal zone where faces a lot of expectations.

The Pekalongan city is exactly a coastal zone that faces severe water threats. And it also sees a dilemma between water and social practice. During the past four months, by analyzing Pekalongan in terms of natural and cultural context, I learned a lot about natural processes, the interaction between nature and social practice, as well as the logic behind it. But the most important thing is that I gradually understand what is the opposite of resilience. The partially and short-term interventions in Pekalongan city already prove that being against nature and without resilience thinking, problems would be even worse.

So based on a comprehensive understanding of Pekalongan’s situation and the theoretical foundation, it is time to elaborate on how to achieve resilience through landscape interventions to address the natural and social threats in Pekalongan city.

Time planning

Time Planning

SEP	P1	Fascination; Site analysis: natural conditions,culture practice; Problem statement: threats and potentials; Research question: objective and sub-research questions;
OCT		
NOV	P2	Research & analysis: regional scale, urban scale, systems literature review case study; Modify design assignment: review research question build up theatrical framework; Design by research: principles experiment and attempts strategy on regional scale;
DEC		
JAN		
FEB	P3	Design by research: detailed scale specific location elaborate spatial integrations of three principles; Experiment & Modeling; Visualization;
MAR		
APR	P4	Details: construction details information; Finalize design project;
MAY		
JUN		
JUL	P5	Conclusion; Reflection;