

Graduation Plan

Master of Science Architecture, Urbanism & Building Sciences



Graduation Plan: Landscape Architecture

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

| Personal information | |
|------------------------|--------------------|
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| Studio | |
|---------------------------------------|--|
| Name / Theme | Flowscape |
| Teachers / tutors | Dr.ir. I. Bobbink, Dr. D.A. Sepulveda Carmona |
| Argumentation of choice of the studio | Change is one characteristic not only of nature but also human. The two systems are transformed and developed simultaneously through time. Several countries across the globe are suffering with the impacts of multiple unresolved disasters from the exploitation of nature in the past. New possibilities of living with environmental changes to mitigate against the impacts or to cope with consequences are needed to be explored. With the concept of “flowscape”, landscape processes are perceived with multi-layered understanding of dynamic interrelation between ecology, social, and economic to determine the socio-ecological challenges of today and future, and to seek for possible solutions to improve both systems. |

| Graduation project | |
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| Title of the graduation project | Redefining Bangkok’s Inclusive Water-Based Society: Flood Resilience Planning of Adaptive and Performative Hybrid Infrastructures Design |
| Goal | |
| Location: | Bangkok, Thailand, South East Asia |
| Fascination and Problem Statement | <p>Perception and relation of people towards water have changed through time since Bangkok, as the capital and the nation’s primate city of Thailand, traces its roots to small trading post which society and water are depended on each other as a way of living, until the city eventually grew and developed as the site of economic centralized megapolis, which the significant of water to society is very poor and irrelevant, only for drainage and sewage. Combining with several unresolved flood incidents, the perception towards water has been forcefully transformed from prosperity to threat for lives. Water is in the stage of decaying socially and ecologically as the current relation between flood and society together with urban development are not getting along.</p> <p>Until what extend, flood management could be incorporated as part of daily living condition of the urban inhabitants in the current context reinforcing socio-ecological transformation of the future society?</p> |

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| <p>Research Objective & Questions</p> | <p>With current urban structure of car-based megapolis, the relations of the city with flood are very vulnerable with top-down approach which influences Bangkok from management in regional scale to urban infrastructures with the negative effects on perception and behavior of people towards water as consequences. As Bangkok is in the stage of crisis, reconsideration of the systems is needed for people to relearn to live with nature in a more resilience way. With practicability and sustainability approach, bottom-up solutions of improving socio-ecological relation towards adaptation in local scale is proposed as the influences could lead to mitigation of solutions in larger scale.</p> <p>The objective of the project is to recreate socio-ecological transformation of Bangkok's future water-based society towards flood resilience planning of adaptive and performative hybrid infrastructures design</p> <ul style="list-style-type: none"> - How flood management could be considered as part of daily system to stimulate social process of living with environmental changes towards flood adaptive and performative landscape? - How green and blue infrastructures could be integrated with the existing grey infrastructure to perform as a new hybrid flood management network for the city? - How flood resilience model help to moderate the impacts of regional and seasonal flood and take advantage of new possibilities for delta cities? |
| <p>Design Assignments</p> | <p>The design assignments are translated in different scales with bottom-up approach.</p> <ul style="list-style-type: none"> - On local scale, adaptive principles from sponge city theory are proposed to integrate multi-use system of flood management to the existing mono-use infrastructures of road, canal, and green space enhancing abilities of public services meanwhile performing as flood solutions. The adaptive infrastructures demonstrate flexibility of programs for public use in different situation, normal and flood situation, as part of the new way of living with climate change. - On urban scale, the adaptive infrastructures of road, canal, and green space are integrated functioning as a single hybrid flood performative network of grey infrastructure together with green and blue infrastructure to maximize both engineering performances of water absorption and other eco-services benefits. The networks are illustrated in the selected site of Pathum Wan district. - On regional scale, the networks are applied in larger potential areas formed up as flood resilience model of Bangkok to determine the performances of risk reduction for the city with the affected surroundings of delta areas. |
| <p>Process</p> | |
| <p>Method description</p> <ul style="list-style-type: none"> - Archival study and cross reference mapping on social and cultural analysis of Bangkok and water management transformation through time to indicate critical factors of changing perception towards water which result as the opposing relation of current car-based urbanization developments against flood | |

- Archival study on risks and vulnerabilities from flood hazard in relation with desk analysis of urban structure and management to determine critical challenges through scales resulting in management and economic challenge in regional scale, urban infrastructure challenge in urban scale and behavior and daily system challenge in local scale
- Literature review for responsive theoretical framework for each scale including flood resilience principle for regional mitigation, hybrid infrastructure for urban structure transformation and sponge city principles with flood adaptation measure of public space for local adaptation
- Based on theoretical researches, Pathum Wan District is selected as pilot site as it is located in downtown area of Bangkok with several significant landuse, public spaces and supporting infrastructures.
- Layer approach analysis of existing infrastructures conditions combine with theoretical framework to form up potential strategic planning proposal for flood resilience city model
- Conceptual mapping and Collage drawing illustrate the conceptual idea of how to imply the model on larger scale and overall conceptual solution of the project

Literature and general practical preference

- Depietri Y., McPhearson T. (2017) Integrating the Grey, Green, and Blue in Cities: Nature-Based Solutions for Climate Change Adaptation and Risk Reduction. In: Kabisch N., Korn H., Stadler J., Bonn A. (eds) Nature-Based Solutions to Climate Change Adaptation in Urban Areas. Theory and Practice of Urban Sustainability Transitions. Springer, Cham
- Neil Adger, W., Huq, S., Brown, K., Conway, D., & Hulme, M. (2003). Adaptation to climate change in the developing world. *Progress in Development Studies*, 3(3), 179–195.
- Groot, Rudolf & Wilson, Matthew & Boumans, Roelof. (2002). A Typology for the Classification Description and Valuation of Ecosystem Functions, Goods and Services. *Ecol Econ*. 41. 10.1016/S0921-8009(02)00089-7.
- Simin Davoudi , Elizabeth Brooks & Abid Mehmood (2013) Evolutionary Resilience and Strategies for Climate Adaptation, *Planning Practice & Research*, 28:3, 307-322, DOI: 10.1080/02697459.2013.787695
- McGrath B., Thaitakoo D., Tachakitkachorn T. (2013) 'Bangkok's Distributary Waterscape Urbanism', in *Village in the City: Asian Variations of Urbanisms of Inclusion*, Eds. Kelly Shannon, Bruno De Meulder, and Yanliu Lin, (Chicago: Park Books – UFO: Explorations of Urbanism, 2013) in press.
- Matos Silva, Maria & Costa, João. (2018). Urban Floods and Climate Change Adaptation: The Potential of Public Space Design When Accommodating Natural Processes. *Water*. 10. 180. 10.3390/w10020180.
- Nguyen, Thuy & Hao Ngo, Huu & Guo, Wenshan & C. Wang, Xiaochang & Ren, Nanqi & Li, Guibai & Ding, Jie & Liang, Heng. (2018). Implementation of a specific urban water management - Sponge City. *Science of The Total Environment*. 652. 10.1016/j.scitotenv.2018.10.168.

Relevance

Flood hazard is considered as global issues for most of the delta countries as it continues to be threat to people lives and living conditions. As flood situations globally keep getting more severe each day by climate changes, Actions are needed for people to be aware and prepared. Be able to learn how to co-exist with flood could be one of the most resilience practice for human adaptation. By Succeed of changing habit and culture of people, to be adaptive with climate changes in local scale, could be a starting point of larger consequences including the transformation of city structures to water-based urbanization which allowed flood to be part of urban flows. The flood resilience city model improves not only the relation between people and water but also reduce the risks from the hazard and provide various eco-services for the city and the surroundings. Furthermore, the project could be an initial development prototype which can be adapted to apply with other delta cities facing the same problems to perform as a larger regional network to mitigate with future consequences.