

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.

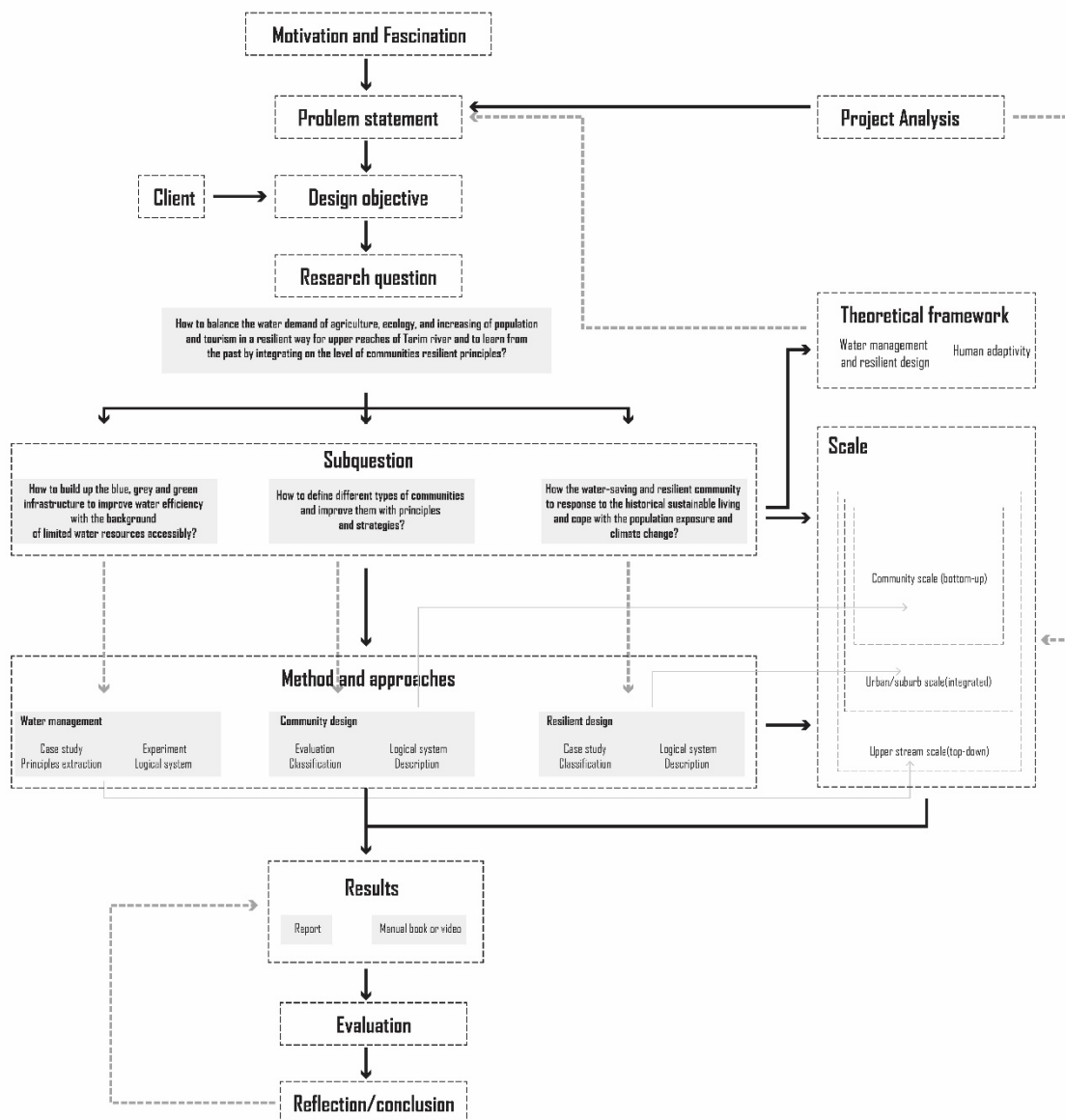
The graduation plan consists of at least the following data/segments:

Personal information	
Name	Xinyu He
Student number	5101565

Studio		
Name / Theme	Flowscapes / Circular water stories	
Main mentor	Inge Bobbink	Landscape architecture
Second mentor	Luiz Marcos de Carvalho Filho	Urbanism
Argumentation of choice of the studio	Landscape architecture studio	

Graduation project	
Title of the graduation project	From survival to revival: A new resilient water management way for upper reaches of Tarim river integrated water-saving community design
Goal	
Location:	Tarim river, Xinjiang, China
The posed problem,	<p>The Tarim River is located in the Xinjiang Uygur Autonomous Region, northwestern arid part of china, where most of the city and people relied on this river as the water source of living. Tarim river has four headstreams, of which mainstream is surrounded by the Taklimakan Desert. The water of Tarim River only from the snow melting and precipitation in the headstreams. In history, this river supports agriculture, aquaculture, and livestock production, which is the reason why people call it the 'mother river'. The Tarim River and oases in the desert played an important role creating the Silk Road. However, as time passed by, living along the Tarim river became harder. Firstly, water distribution is unequal. People living along the headstream expanded the farmland area without restrictions. Secondly, people living in the upper stream also expanded farmland and built reservoirs which caused water shortage and decreased green surface. Thirdly, the future development of the city and tourism will bring more people to this region which will ask for more water consumption. Fourthly, the extreme change of inflow each year makes it difficult to calculate the water amount. Moreover, the climate change slightly increases the water inflow in a short term and decreases in a long term. Lastly, because of farmland water consumption increase and modernization, the diverse traditional living styles are lost.</p> <p>More precisely, the Tarim river basin suffers water scarcity due to unequal distribution, unpredictable yearly inflow, climate change,</p>

	<p>population growth and farmland exposure. And people are losing their traditions which started from Silk Road period.</p> <p>From personal perspective, those problems is interesting because it's not only worldwide problem that many places are facing or will face, but the Tarim river basin is a mysterious place that I want to explore because of totally different landscape, folk custom and people from where I live.</p>
<p>research questions and</p>	<p>The objective of this project is to mitigate water scarcity through, not only management and technological ways, but also by landscape architecture means. And to build up communities who enhance traditions and, is sustainable and resilient to population exposure and climate change in a bottom-top approach is also included in the objective.</p> <p>'How to balance the water demand of agriculture, ecology, and increasing of population and tourism in a resilient way for upper reaches of Tarim river and to learn from the past by integrating on the level of communities resilient principles? '</p> <p>There are sub-questions:</p> <p>How to build up the blue grey and green infrastructure to improve water efficiency with the background of limited water resources accessibly?</p> <p>How to define different types of communities and improve them with principles and strategies?</p> <p>How the water-saving and resilient communities respond to historical sustainable living and cope with population exposure and climate change?</p>
<p>design assignment in which these result.</p>	<p>This project will explore the potential of water efficiency on this different scale</p> <ul style="list-style-type: none"> - On the community scale, communities will be defined into different categories. The principles summarized from theoretical frameworks are implied in different categories. - On the urban/sub-urban scale, the resilient communities will be tested on specific locations and a more detailed interrelationship of communities with the upper stream scale strategies will be showed. - On the Tarim upper stream scale, as it is a huge regional scale, the product should contain a detailed water distribution plan including the blue, grey and green infrastructure improvement. An adaptive model of different water consumption units will be proposed in order to show the interrelationship.
<p>Process</p>	
<p>Method description</p>	



Literature and general practical preference

Dreiseitl, H., et al. (2014). Out of water : design solutions for arid regions.

Li, Z., et al. (2020). "Partitioning the contributions of glacier melt and precipitation to the 1971–2010 runoff increases in a headwater basin of the Tarim River." 583: 124579.

Malloy, R., et al. (2016). Design with the Desert: Conservation and Sustainable Development, CRC Press.

Moran, E. F. (2009). Human Adaptability: An Introduction to Ecological Anthropology, Avalon Publishing.

Yu, G.-A., et al. (2016). "River network evolution and fluvial process responses to human activity in a hyper-arid environment—Case of the Tarim River in Northwest China." 147: 96-109.

Yu, Y., et al. (2017). "Agricultural water allocation strategies along the oasis of the Tarim River in Northwest China." 187: 24-36.

张沛, et al. (2017). "塔里木河“九源一干”可承载最大灌溉面积探讨." 34(1): 223-231.

水资源开发与管理, 师. J. (2019). "塔里木河“三源一干”近 60 年径流演变规律分析." 7: 12-23.

水资源开发与管理, 金. J. (2020). "气候变化对塔里木河源流径流近 61 年的影响分析." (6): 15-19.

Reflection

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)?

This project is included in the landscape architecture Flowscape studio and in the Circular water stories lab. This lab is mostly focused on water and its relationship to the human, and that kind of stories interreact with different landscape layers, forming what we could see today. That's why this project is focusing on landscape architecture solutions for water scarcity by integrating the human history and its future.

As a landscape architect, generally we will create better landscape environmental condition. And in this project, I also focus on the ecological issues which arose from the water in this region.

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

This graduation work starts the discussion for a change in the area on the level of a water related design. People can be educated to care for the landscape so that they can provide it in the long term.

In the professional and scientific scale, this project hopefully can contribute to the gap between water management knowledge and landscape architecture practice. And also, this project can be an example of arid region landscape design to cope with water scarcity and resilient for future change.