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	Melinda Marján
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Telephone number	
Private e-mail address	

Studio	
Name / Theme	Flowscapes
Teachers / tutors	Inge Bobbink, Kristel Aalbers
Argumentation of choice of the studio	Landscape Architecture Studio

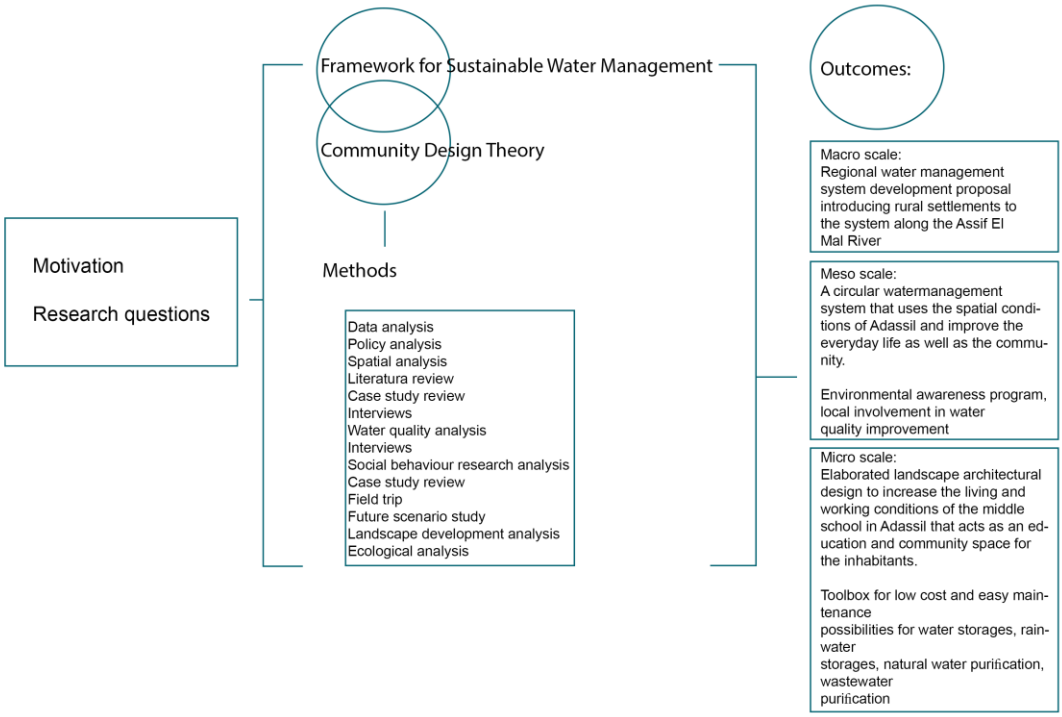
Graduation project	
Title of the graduation project	Re-connecting with water Creating spatial solutions in rural areas of Morocco suffering from climate change, water scarcity and lost connection with the social and environmental importance of water.
Goal	
Location:	Morocco- Settlements along the Assif El Mal River- Adassil- Middle school of Adassil
The posed problem,	It is widely known that the average temperature is most likely to increase 2-3 ℃ by 2050 in the North African region while precipitation is going to decrease 10-20 per cent in the area, leaving the already semi-arid, arid countries more vulnerable to extreme weather conditions (Schilling, Freier, Hertig, & Scheffran, 2012). Being a Mediterranean arid, semi-arid country, Morocco and its inhabitants are already familiar with the terms: drought, water scarcity or water stress, still seemingly the country is unable to cope with these difficulties. In Morocco the average freshwater resource of an inhabitant is 1000 m3/capita/year, the starting level of water

	scarcity is usually defined starting below this measure. In the poor, rural regions of the country the average available water resource is 180 m3/capita/year which means water scarcity is a permanent challenge for the inhabitants of these areas (Mandi & Ouazzani, 2013). With a complex system of authorities, stakeholders and lack of financial support, the rural areas and inhabitants living on these parts of the country are to some extent neglected as their fresh water demands are not satisfyingly solved. The Assif El Mal River, based in the western side of the Atlas Mountain is the only source of fresh water for several small settlements both in the mountain and the flat areas along its riverbank. As the river is completely fed from precipitation its flowrates are irregular and is almost completely dry during the summer months leaving the people dependent on it without water. The inhabitants in the area live in constant absolute scarcity with an average water resource of 200-180 m3/capita/year available. As these settlements are not connected to any sort of water or waste water system, the people capture and store the water without any treatment and discharge their wastewater back into the Assif El Mal River which means, the freshwater they store and use for all purposes, drinking, cleaning, irrigating is highly contaminated and does not qualify as portable quality water, causing social and health issues in the area. While the people of Morocco have a deep traditional relationship with water and the waterside, today the once cherished water is contaminated, the waterside is polluted by the people, in a way the connection with nature is slowly becoming absent in the local's everyday lives. Fresh water became a health hazard issue

	as its level of pollutant frequently reaching such a high point it becomes dangerous.
research questions and	Main research question: How can a regional, circular water system be implemented in a landscape architectonical way that is part of the social life? Sub-questions: -What are the present characteristics of Morocco's water system management? -How can the existing regional water management system be combined with a new expansion connecting the rural settlements and be implemented into the landscape of the mountain areas of Morocco? -What kind of freshwater resources can be used in the area and which way can the water be purified naturally/using the existing possibilities provided by the landscape? What kind of multi-scaled water management system would support the both the urban and rural areas of the country? - How would spatial developments affect the social and traditional relationship between the inhabitants and the waterside? -What kind of communicational strategy can be used effectively in the case of environmental awareness and how can the inhabitants of the Atlas Mountains be involved in the works of gaining reliable fresh water resources?
design assignment in which these result.	Theoretical framework, site analysis, regional water management plan, spatial design system, circular water system for villages, institutions, social environmental awareness program, toolbox for low cost water management elements, reflection

Process

Method description



Literature and general practical preference

Aziz, F., Mandi, L., Boussaid, A., Boraam, F., & Ouazzani, N. (2013). Quality and disinfection trials of consumption water in storage reservoirs for rural area in the Marrakech region (Assif El Mal). *Journal of water and health, 11*(1), 146-160.

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Swearingen, W. D. (1992). Drought hazard in Morocco. *Geographical Review*, 401-412.

Reflection

Relevance

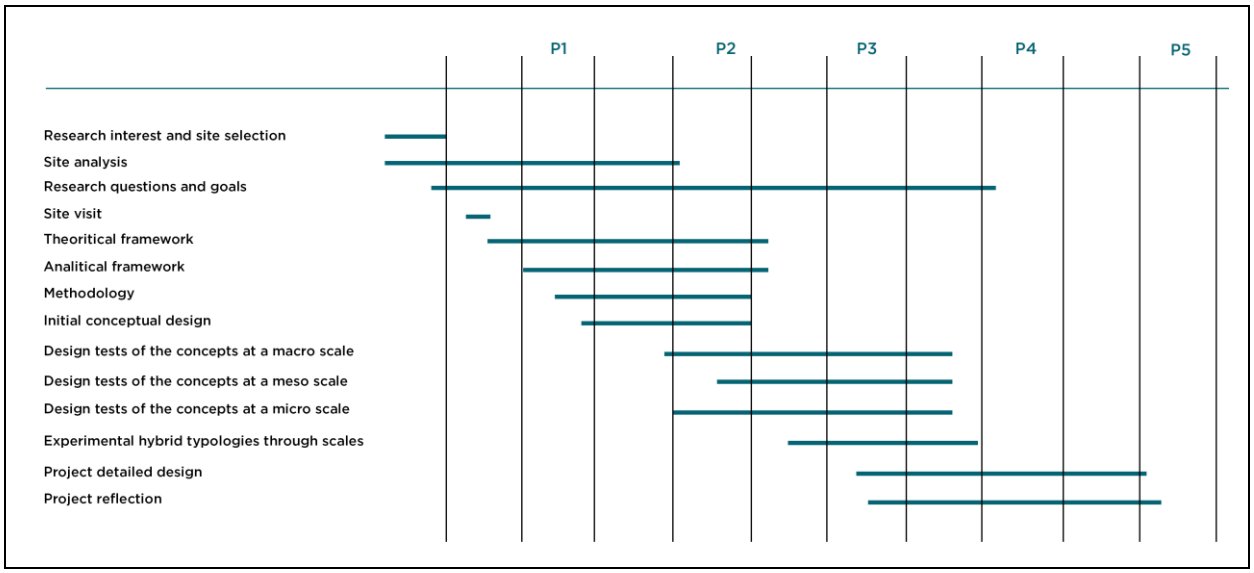
Scientific relevance:

As Morocco is already experiencing drought related issues the government is not able to cope with due to the vague interaction between stakeholders and administrational sectors, the goal of this thesis is to provide a feasible, multi-scale system and collaboration method to the water related sectors to overcome the fresh water problems of the country.

Social relevance:

The problem of water stress is defined starting from 1000 m3/capita/year while in many areas of Morocco the average water available is 180 m3/capita/year (Mandi & Ouazzani, 2013) and as the climate changes the accessible freshwater resources are decreasing. Water related problems are creating social issues erasing, deforming the once deep traditional relationship between people and the water as they are losing respect to the waterside. This thesis aims to rebuild the connection between locals and the water landscape by involving inhabitants to establish diverse water system that improves their living conditions.

Time planning


P1
P2
P3
P4
P5
Research interest and site selection
Site analysis
Research questions and goals
Site visit
Theoritical framework
Analitical framework
Methodology
Initial conceptual design
Design tests of the concepts at a macro scale
Design tests of the concepts at a meso scale
Design tests of the concepts at a micro scale
Experimental hybrid typologies through scales
Project detailed design
Project reflection