

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	Shiming Xu
Student number	5567866

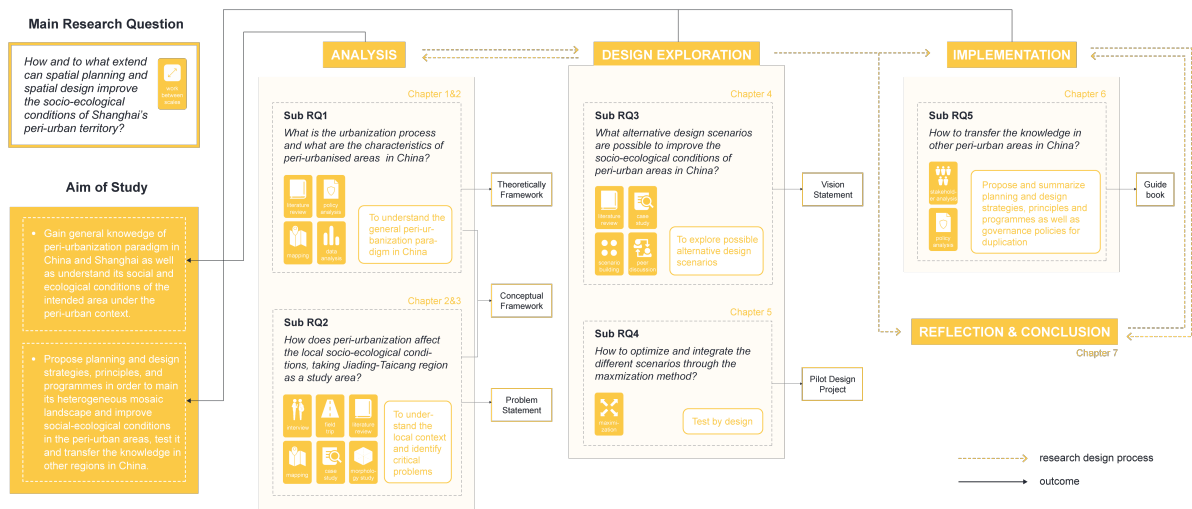
Studio		
Name / Theme	Metropolitan Ecologies of Place	
Main mentor	Cecilia Furlan	Environmental Technology & Design
Second mentor	Lei Qu	Spatial Planning & Strategy
Argumentation of choice of the studio	<p>Urbanization is a global phenomenon and China has experienced rapid urban development in the last three decades. Shanghai now has an urbanization rate of over 85% and a polycentric pattern. The middle of the city, where rapid urbanization is taking place, creates a transitional landscape that is different from that of the city and the countryside.</p> <p>These peri-urban areas have a uniquely heterogeneous landscape where urban, productive, and natural systems are intertwined. In recent years, sprawl and pressure on resources and the environment have created many socio-ecological problems for peri-urban areas. For example, urban sprawl into the surrounding areas has led to the encroachment of large amounts of agricultural land and the fragmentation of land has led to the loss of biodiversity. Industrial intrusion, unsustainable agricultural activities, and other human activities have resulted in soil and water pollution. In addition, the gap between urban and rural development has led to the decline of suburban areas and poor living conditions in peri-urban areas. In addition, China's planning has long been urban-oriented, with insufficient attention paid to the development of rural towns.</p> <p>The MEP studio address the challenges of the climate crisis, resource scarcity, biodiversity loss, and population aging from a climate and ecological perspective. These are precisely the problems faced by peri-urban areas in metropolitan areas. The essence of the studio is to use</p>	

	<p>ecological principles to design for human and ecological well-being by interacting with flow and form. In my project, this can be interpreted as reconciling the conflicts between the three ecosystems in peri-urban areas through spatial planning and spatial design in order to preserve the unique peri-urban landscape, improve the regional ecology and compensate for the imbalances in regional development. I am interested in the studio's systems design approach as I want to study the spatial and temporal evolution of peri-urban areas through morphology, structure their ecosystem complexity from a systems perspective, and explore spatial planning and design strategies. I think the communication and collaboration within the studio will provide me with more inspiration to refine the project.</p>
--	--

Graduation project	
Title of the graduation project	TOWARDS A TRANSITION TERRITORY Planning and design strategies to improve social and ecological conditions in the peri-urban area of Shanghai
Goal	
Location:	Taicang-Jiading area, Shanghai, China
The posed problem,	<p>Urbanization is a global trend, and China's Yangtze River Delta region has experienced rapid urbanization over the past 30 years, showing a compact development pattern that urban development happened around a relatively small mature center (Shanghai central city) (Webster, 2002), which top-down state-led development and bottom-up township development drove peri-urbanization in the suburbs, a process exacerbated by the involvement of market forces, and the 1999 Shanghai's master plan lacked the ability to cope with uncertainty and lost control over the scale of population and building land, resulting in urban sprawl, massive loss of agricultural land, land fragmentation, inefficient land use, and serious environmental pollution. Peri-urban areas have become areas where low-quality housing and foreign populations congregate (Chen, 2020) and living conditions are poor. And in the face of the increasingly severe pressure on resources and the environment, ecological protection is necessary, contradicting land use with arable land protection and urban growth needs, making peri-urban areas the most intense battleground for conflict.</p> <p>The new urban master plan proposes to build the infrastructure of new towns and improve the environment of the inhabitants; relocate villages to guide the concentration of rural residents; and consolidate land to improve the efficiency of its use. These strategies have improved the</p>

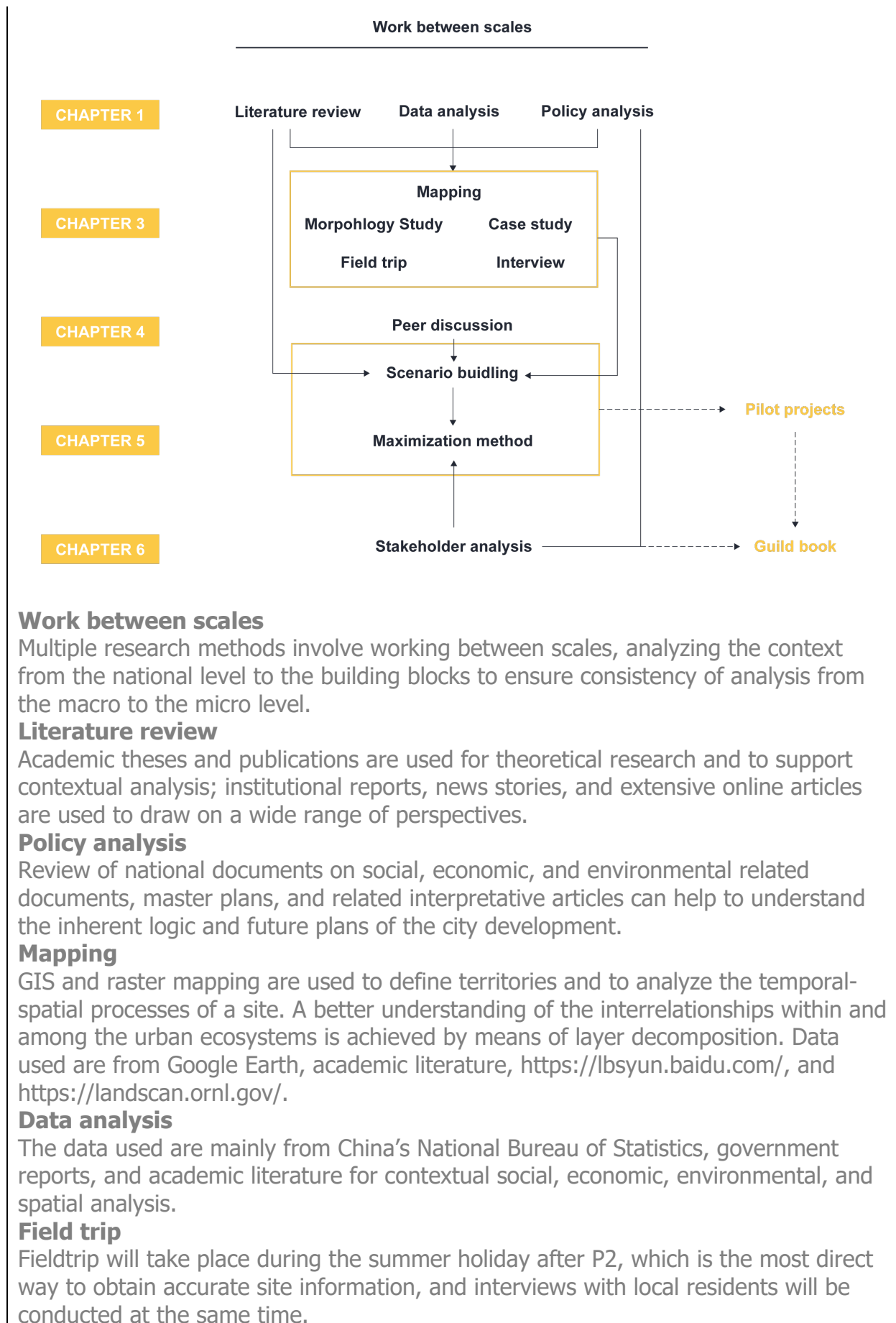
	<p>quality of living in peri-urban areas to a certain extent, but they have also meant that a large number of villages have been transformed into townships, destroying the heterogeneous mosaic landscapes of peri-urban areas and posing a potential risk of urban sprawl. The rural landscape has its own unique value, and the construction of new towns should be accompanied by a focus on rural development to attract the rural population back, which will curb urban sprawl and preserve the charm of peri-urban areas while improving their social environment and promoting ecological conservation. In addition, peri-urban areas need to best prepare for the uncertainty of the future by creating a sustainable and resilient area.</p>
research questions and	How and to what extent can spatial planning and spatial design improve the socio-ecological conditions of Shanghai's peri-urban territory?
design assignment in which these result.	Propose planning and design strategies, principles, and programs in order to maintain its heterogenous mosaic landscape and improve the socio-ecological condition in the peri-urban areas, test it with a pilot project and transfer the knowledge in other regions in China.

Research design framework



Process

Method description



Work between scales

Multiple research methods involve working between scales, analyzing the context from the national level to the building blocks to ensure consistency of analysis from the macro to the micro level.

Literature review

Academic theses and publications are used for theoretical research and to support contextual analysis; institutional reports, news stories, and extensive online articles are used to draw on a wide range of perspectives.

Policy analysis

Review of national documents on social, economic, and environmental related documents, master plans, and related interpretative articles can help to understand the inherent logic and future plans of the city development.

Mapping

GIS and raster mapping are used to define territories and to analyze the temporal-spatial processes of a site. A better understanding of the interrelationships within and among the urban ecosystems is achieved by means of layer decomposition. Data used are from Google Earth, academic literature, <https://lbsyun.baidu.com/>, and <https://landscan.ornl.gov/>.

Data analysis

The data used are mainly from China’s National Bureau of Statistics, government reports, and academic literature for contextual social, economic, environmental, and spatial analysis.

Field trip

Fieldtrip will take place during the summer holiday after P2, which is the most direct way to obtain accurate site information, and interviews with local residents will be conducted at the same time.

Peer discussion

Discussions with peers and contacts help with initial exploration and stage reflections and receive spiritual encouragement.

Scenario building

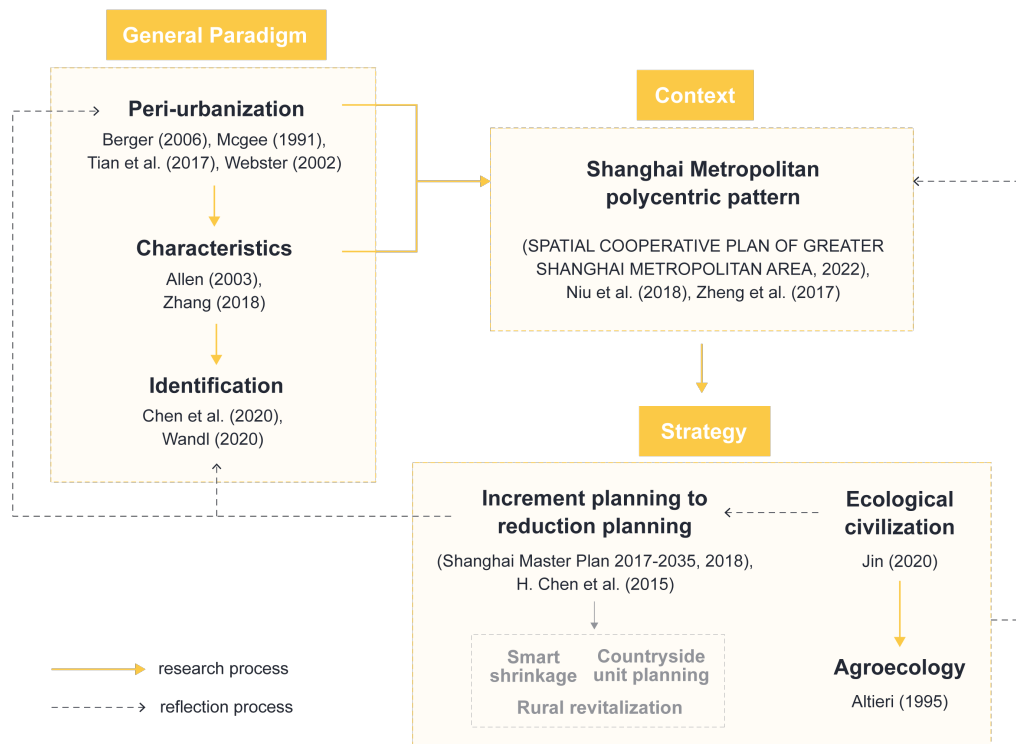
Scenario building is used to explore future possibilities under different development paths to cope with uncertainty. In this thesis, it is also used in the first stage of the maximization method, i.e. the most desirable situation under four development paths.

Maximization method

The maximization method consists of three phases: maximization, optimization, and integration. In the first stage, four scenarios are developed. Then, in the optimization phase, choices are made among the different scenarios. This can be done by introducing stakeholder requirements, as long as it justifies the choices made. In the final stage, the optimized solution is integrated into a pilot design project with the other factors taken into account.

Literature and general practical preference

Theoretical Underpinning



The theoretical underpinning is conducted in three parts. First, investigate theories on the general paradigm of peri-urbanization, characteristics, and identification of peri-urban. Second, applied the knowledge in the contextualization of the Jiading-Taicang area, Shanghai, and research on theories about its polycentric pattern to further improve the understanding of its peri-urban area. According to the problem identified through research, namely urban sprawl and environmental constraints, corresponding strategies related theories, and practices are investigated. Reflection is conducted during the research to ensure the coherence between the theories and verified the conclusions that have been made.

Practical experience: “Tianfu Xinxing – Hesheng Pastoral Oriental” Pastoral Complex



In recent years, with the implementation of new urbanization and rural revitalization strategies, the middle class has been affected by “urban diseases” in areas such as traffic, housing, the environment, etc. At the same time, the traditional way of life of farmers in the countryside lingers, maintaining time-honored methods of production and healthy liveliness. SYN Architects acts as an observer and, simultaneously, takes part in the process of rural construction, linking two different lifestyles in projects developed in non-urban areas. By means of precise spatial planning and content implementation techniques, the firm designs and creates new ecosystems of urban and rural integration in the countryside. The “Tianfu Xinxing – Hesheng Pastoral Oriental” Pastoral Complex is a spatial experiment based both in the philosophy of New Pastoralism and idyllic countryside scenes.

Source : <https://www.goood.cn/common-ground-pastoral-demonstration-area-western-sichuan-china-by-syn-architects.htm>

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)?

My graduation topic "Spatial planning and design strategies to improve the socio-ecological environment in peri-urban areas" is in line with the MEP Studio's focus on designing metropolitan environments from an ecological perspective. The Urbanism track aims to provide future urban planners/designers with the academic skills to critically analyze the urban environment and urban development and to propose new solutions for the effective, sustainable, and liveable organization and management of the urban environment. My theme focuses on the evolution of

spatio-temporal patterns in peri-urban areas at multiple scales, integrating social, cultural, economic, and political perspectives with the natural and man-made conditions of the site to shape and plan for more sustainable regional development. The AUBS Masters program offers a diverse range of orientations from design practice, physical and social sciences, technology, and engineering, and explores innovative ways to create more sustainable development. My project takes a research design approach, exploring the future of peri-urban areas through spatial planning, urban design, and environmental technology.

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

Scientific relevance

1. Summarize and complement existing studies on the peri-urbanization process and peri-urban context from a systematic and morphological perspective in the Shanghai metropolitan area.
2. Complement existing urban master plans with planning strategies and design principles, actions, and programs for peri-urban areas, maintaining regional landscape character and improving socio-ecological conditions.
3. Serve as a pilot project for the planning and design of peri-urban areas and to transfer knowledge to other metropolitan areas.

Societal relevance

1. Improve the social and ecological conditions of the Shanghai metropolitan periphery and provide a better living environment for wildlife and people
2. Raise public awareness of the need to protect natural and productive ecosystems in the peri-urban areas.

Ethical considerations

1. The Yangtze River Delta is a unique region with a concentration of national talent and a large amount of investment and experimental projects from the state, so while the region is the most peri-urbanized, the peri-urban areas are also in a better socio-ecological condition, and some of the less developed and poorer areas may need more attention. However, because of more adequate funding and a more inclusive and open social environment, there is less resistance to the implementation of the project and therefore it is more suitable as a pilot project and to be extended to other regions.
2. The project will propose a new lifestyle designed to attract people back to the peri-urban area and complement the urban area, but it is unclear whether this will cause urban decline and be opposed by city residents.