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	Yuqian Jiang
Student number	5814480

Studio		
Name / Theme	Planning Complex Cities	
Main mentor	Dr. Lei Qu	**Spatial Planning & Strategy** - Expert in inclusive planning and integrated urban/ regional development strategies, with particular emphasis on interdisciplinary approaches to tackle issues related to cross-cutting themes of livability and circularity.
Second mentor	Dr. Alexander Wandl	**Environmental Technology & Design** - Expert in extended territorial metabolism approach, integrating methods and tools from urban planning and design, landscape architecture, and spatial data science in a multiscale approach to sustainable urbanism.
Argumentation of choice of the studio	The basic starting points of Planning Complex Cities graduation studio are observations of disparities and conflicts arising from the distribution of spatial resources across communities and territories (Yearguide MSc3+4, 2023). My graduation topic is about the integrated and socio-ecologically resilient development of desakota in Liaoning, China. The desakota of Liaoning, as an intermediate area between urban and rural areas, is suffering from marginalization and socio-ecological degradation due to neglect in planning. In addition, the socio-ecological system of Liaoning's desakota is further stressed due to the impact of shrinking cities. These issues are consistent with the starting points of the studio. At the same time, this studio's equal attention to theory and practice will help me to develop an academic mindset and look critically at desakota's problems and opportunities.	

Graduation project		
Title of the graduation project	**Live in Between:** The integrated and socio-ecologically resilient development of desakota in the context of shrinking cities in Liaoning, China	
Goal		
Location:		Liaoning, China

The posed problem,	Desakota is marginalized in the megaregion and suffers from socio-ecological degradation due to planning neglect. It passively carries the spillover functions of the cities and suffers from the negative externalities of them. Lacking values and identity, desakota is unable to provide benefits to and from cities. This results in desakota not being able to integrate into the megaregion and develop together.
	Due to long-term economically orientated development, human activities in desakota stress the ecosystems, resulting in the inability of ecosystems to provide stable ecosystem services. While social systems fail to protect the integrity of ecosystems when pursuing economic development. These two systems are unable to provide positive feedback to each other. At the same time, marginalization and urban shrinkage are also negatively affecting the social-ecological system of desakota.
	In summary, the socio-ecological system of desakota in Liaoning is degrading and cannot respond to endogenous or exogenous changes, while maintaining its functions and innovating and transforming to a desirable future, which presents serious challenges for desakota. However, due to its high ecological integrity compared to urban areas and its industrial base compared to rural areas, Liaoning's desakota has a great opportunity to provide socio-ecological values to the rest of the megaregion.
research questions and	**Main Research Question:** How to achieve the socio-ecologically resilient development of desakota in the context of shrinking cities in Liaoning?
	Sub-research Questions: 1. What does socio-ecological resilience mean to desakota? 2. What's the current state of the social-ecological system in Liaoning's desakota? 3. How does shrinkage affect the socio-ecological system of desakota in Liaoning? 4. How to regenerate the ecosystem and enhance human well-being in desakota? 5. How to ensure positive feedback between ecosystem and social system in desakota? 6. What socio-ecological values can desakota offer to the rest of the megaregion? 7. How can adaptive planning enhance the resilience of desakota's social-ecological system?
design assignment in which these result.	The aim of the research is to revitalize desakota through socio-ecologically resilient development and integrate desakota into the megaregion as

an important role in the context of shrinking cities.

(1) Understanding the socio-ecological resilience of desakota

In the context of urban shrinkage, it is difficult for desakota to achieve revitalization through regrowth, so the vision for desakota should be socio-ecological resilience.
By building socio-ecological resilience, desakota can provide socio-ecological values to other parts of the megaregion and can be integrated as an important role.

(2) Strategies for building socio-ecological resilience in Liaoning's desakota

A resilient social-ecological system consists of healthy ecosystems and social systems with high well-being and positive feedback between the two. Simultaneously, the entire system must possess the capacity to adapt and respond to dynamic changes. Based on this, the following strategies will be used to build social-ecological resilience in Liaoning's desakota: (1) Regenerate ecosystems. (2) Enhance local human well-being. (3) Ensure positive feedback between social and ecological systems. (4) Improve the adaptive capacity of the whole system.

(3) A vision for socio-ecological resilient desakota

Based on these strategies, a vision for socio-ecological resilient desakota in Liaoning will be proposed.

(4) A range of scenarios and improvement of current planning process

According to adaptive planning, a range of scenarios will be built and suggestions for the improvement of the current planning process will be proposed.

Process

Method description

This thesis uses mainly qualitative research methods, but a small amount of quantitative data (mainly GIS data) will also be used. To answer the above questions, literature review, mapping, case study, fieldwork and interview, policy analysis, stakeholder analysis, elemental approach, and scenario building will be used. Three main methods are explained here.

Case study:
In this thesis, specific cases will be selected for detailed study when analyzing at the mesoscale and microscale. Because the socio-ecological system of desakota is complex, the analysis of specific cases will help to better understand them in Liaoning.
When choosing the specific case for the mesoscale study, Wafangdian, which is close to Dalian, was chosen. As a county-level city, Wafangdian is affected by the siphoning influence of Dalian, showing serious urban shrinkage problems and population loss. The bearing industry and equipment manufacturing industry are the pillar industries of Wafangdian, so there are many desakota around the city that take the spillover functions of the city and combine industrial and agricultural activities. Close to the Shen-Da Expressway, with a certain level of industry and retaining a large amount of agricultural land, the desakota around Wafangdian is significant and has a high potential. Therefore, taking Wafangdian as the center, a square of 30km*30km is chosen as the main study area for the mesoscale. To facilitate the analysis of the relationship between the selected case and its surroundings, the surroundings of 20km around it will be taken into consideration as well.

The selection of microscale cases will be made within the mesoscale case. Firstly, the desakota in the mesoscale will be categorized based on their main industry and location. There will be four categories: mainly dependent on agriculture, mainly dependent on industry, close to cities, and close to villages. Subsequently, within each of the four categories, a 5km*5km case will be selected as a microscale case for further analysis.

Also, this study will select foreign cases for comparative study. Critically analyzing foreign cases that adopt adaptive planning in peri-urban areas will provide guidelines for implementing adaptive planning in desakota in Liaoning. The foreign cases will be compared with the cases selected within Liaoning to analyze the similarities and differences and to test whether the foreign adaptive planning strategies are applicable under the Chinese planning system. And the cases that are suffering from urban shrinkage will also be taken for comparative study. For example, the Ruhrgebied in Germany, and Zwishenstadt in the Netherlands.

The elemental approach:
The elemental approach is used in this study because the concept of multiple complex systems is involved (i.e., desakota's social system and ecosystem and the socio-ecological system in which the two subsystems interact). Starting from the elements, which are the basic components of the system, it is more helpful to understand the system and to propose interventions by analyzing the distribution of the elements, their interactions with other elements, and the relationship between layers and layers. The elemental approach and the layer approach are similar but different. They are similar in that they interpret complexity by deconstructing complex systems to understand the relationships of components within the system. The difference is that the elemental approach subdivides the layers further, viewing the elements as the smallest units. By intervening in the distribution or organization of elements, changes in the layers are realized, which then affects the whole system. Desakota, as a space combining agricultural and non-agricultural activities resulting from the spread of urban activities into rural areas, is composed of diverse and complex elements. The elemental approach is more conducive to presenting and analyzing the complexity of desakota.

The main elements included in this study are farmland, factories, farmhouses, orchards, roads, public spaces, schools, healthcare, wetlands, rivers, etc. These elements, as the basic components that make up desakota, cover the spaces, facilities, and industries in desakota that are closely related to daily life and can better show the situation of desakota.

The elemental approach will be used for both meso-scale and micro-scale analysis. The author will interpret the zoom-in areas through comparing the same elements in different cases, comparing or relating different elements in the same case, and relating different layers composed of elements.

Scenario Building:
Scenario building in this thesis is cross-scale. A range of possibilities for desakota to achieve socio-ecological resilience and integrated development are demonstrated through scenarios at three scales: macro, meso, and micro. Since desakota has different agricultural and industrial bases and is to be integrated by providing socio-ecological values to the rest of the megaregion, the four metrics of the scenarios are set to be: predominantly agricultural, predominantly industrial or other non-agricultural industries, emphasizing social values within socio-ecological values and emphasizing ecological values within social values.

Methodological Framework:
Based on the above research methods, together with the motivation, research aim, and research questions of the study, the methodological framework was set as shown below.
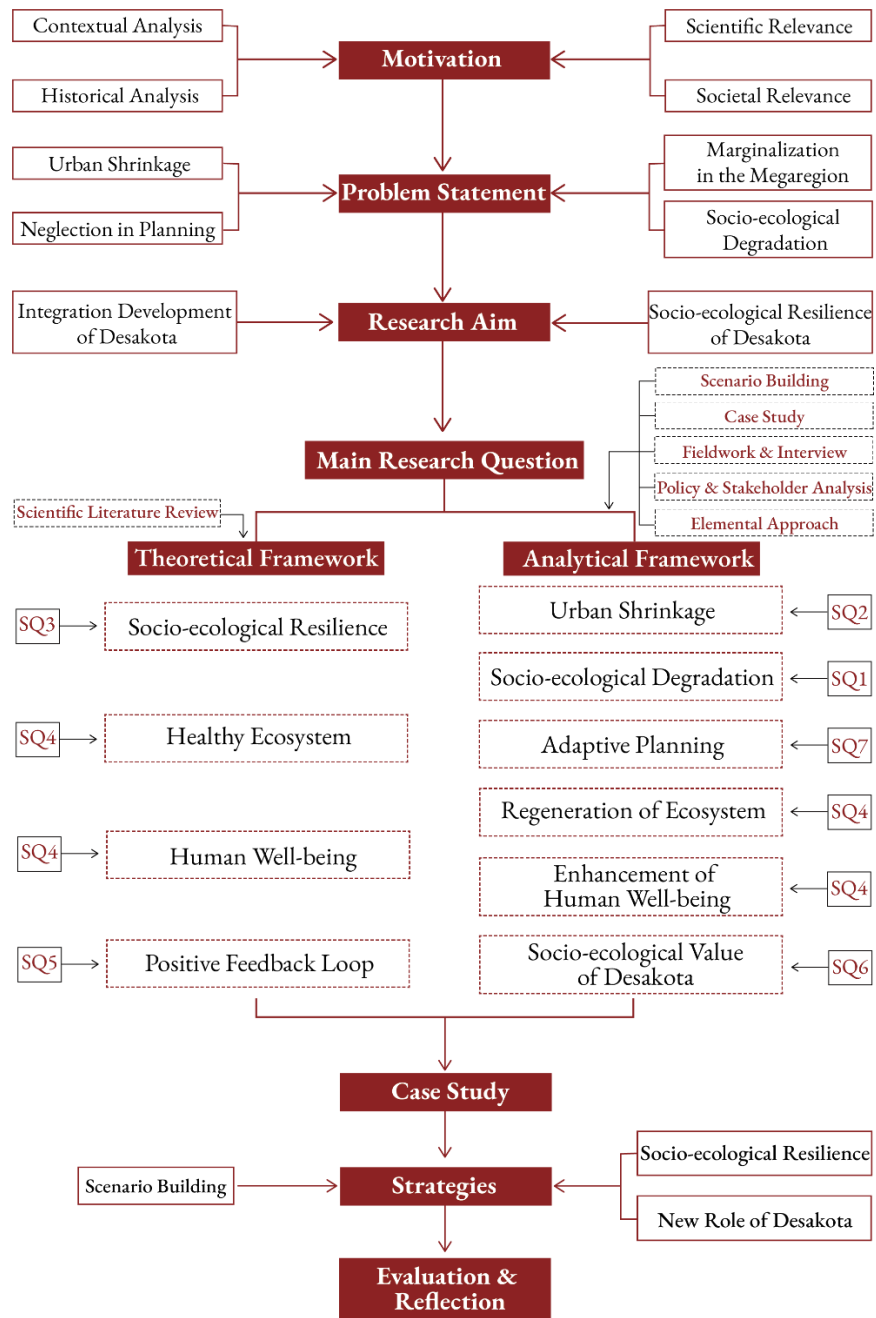
Literature and general practical references

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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 is about the integrated and socio-ecologically resilient development of desakota in Liaoning, China. The basic starting points of Planning Complex Cities graduation studio are observations of disparities and conflicts arising from the distribution of spatial resources across communities and territories (Yearguide MSc3+4, 2023). The desakota of Liaoning, as an intermediate area between urban and rural areas, is suffering from marginalization and socio-ecological degradation due to neglect in planning. In addition, the socio-ecological system of Liaoning's desakota is further stressed due to the impact of shrinking cities. These issues are consistent with the starting points of the studio.
Urbanism as an interdisciplinary planning and design activity, focuses on the (re)creation of sustainable urban landscapes aimed toward climate adaptability, circularity, social equity, and ecologically inclusive urbanization at all scales. The exploration of the socio-ecological resilience and integrated development of desakota is also in line with the aims of Urbanism.

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

Societal Relevance:
With the increasing attention on non-urban areas by Chinese authorities, there are plenty of policies and planning projects concerning villages with favorable landscape conditions ('construction of beautiful villages') or old towns with historical heritage ('historical towns preservation'). In contrast, there are no specific planning documents, or revitalization projects, for the very common industrial-agricultural mixed desakota. Desakota is overlooked in the planning process.
Secondly, most of the rural revitalization projects that can be used as references for revitalizing desakota take place in the eastern, and southern coastal regions of China, and rarely involve the northeastern part. However, as an Old Industrial Area, desakota in the northeast region with an intensive mixture of agricultural and non-agricultural activities are very widely distributed.
In conclusion, it is hoped that this study will draw the attention of planners and policymakers to desakota, especially those in the northeast that are under pressure from urban shrinkage, and that institutions can realize that these areas are being marginalized. It is also hoped that this study will serve as a reference for similar areas facing similar problems and that it will ultimately lead to a tangible change in the predicament that these areas are facing.

Scientific Relevance:
Existing research on desakota mainly focuses on prosperous megaregions like the Yangtze River Delta, the Great Bay Area, and the Jing-Jin-ji megaregion, with less attention paid to Liaoning, which is experiencing urban shrinkage. The problems faced by desakota in this context are more severe, so this study aims to fill this gap and draw the attention of other researchers to this type of area through the study of desakota in Liaoning.
While there is a wealth of research on the sustainability of shrinking cities and peri-urban areas, there is a lack of research on the combination of the two. Therefore, this study also aims to fill this knowledge gap by exploring the possibilities for the future transformation of desakota from a socio-ecological perspective in the context of shrinking cities.