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	**Luiz Felipe do Nascimento**
Student number	5255082

Studio		
Name / Theme	Transitional Territories	
Main mentor	Taneha Kuzniecow Bacchin	Urbanism (Urban Design)
Second mentor	Denise Piccinini	Landscape Architecture
Argumentation of choice of the studio	The choice of the graduation studio reflects my affinity with the subjects discussed during the introductory presentations, as well as the material written on the studio program and my knowledge of the studio and mentor's work within the University and graduation thesis that were previously mentored by them. These components helped to evaluate the synergy between the interests behind the elaboration of this thesis and the studio mentor's skills. From the start, it was essential to be immersed in an academic environment open to the possibility of doing graduation work in a foreign country. The Transitional Territories is the most well-suited to accommodate my research above all, because of the multidisciplinary, very internationally-oriented body of tutors. Developing a thesis in a distant location from the Netherlands requires special attention to certain local aspects and the disparities between the different realities of the place. Furthermore, I would appreciate being surrounded by fellow students with the same drive and motivations as I have, in a challenging yet familiar and friendly environment, as it was described by the students who shared their stories during the introductory presentations.	

	The Studio's lines of research go very in synch with how the issues presented by the location that I chose to develop my thesis, the Tietê River Basin, in the State of São Paulo, Brazil, must be addressed to guarantee a livable future in the region. Some of the methods used by the Studio are also aligned with the expectations for this thesis, as I intend to develop research with the support of critical cartography and literature, followed by an experimental design focusing on the transition of land-use patterns in the Tietê River Basin.

Graduation project	
Title of the graduation project	Regeneration of Ecological Integrity in the Tietê River Basin
Goal	
Location:	Upper-Tietê River Basin, State of São Paulo, Brazil
The posed problem,	An affluent of the Paraná River, the Tietê River shapes the homonym basin that runs almost 700 km inland, from the Atlantic coast towards the countryside. From its source, in the highlands of the Coastal Mountain Range, to its mouth on the Paraná, the river runs through several different types of natural and highly-urbanized areas which have altered and shaped watercourses in many different ways. Within the Basin, the natural environment and its processes have been severely altered from their original state throughout almost two centuries. A process of predatorial exploration of the land by different urban forms going back to the time of colonization. This transformation increasingly depleted the soil by tearing down the forest, followed by intensively extractive agricultural practices aligned with a series of distinct economic cycles. To meet the demands of the economic and populational growth of the region, the water network and water bodies have been disrupted by the construction of several infrastructures for the production of energy by hydropower plants and flood control. During the past decade, environmental problems such as extreme droughts, floods, forest fires, and dust clouds have exposed the fragility of the ecological integrity and the

	economic model behind the use and production of space in the State of São Paulo, Brazil. The transformation of the hinterland, from tropical forest to extensive monocultures affected the climate and the natural environment by, amongst many factors, the intensive use of industrial agriculture techniques and subsequent degradation of soil and water infiltration capacity, compromising groundwater levels, recharge of aquifers, and recycling of moisture from the Atlantic Ocean towards the hinterland. Within the Basin, almost 80% of the former forest now has been destroyed, compromising the biotic pump of the Atlantic Coast, altering the rainfall regimes and temperatures, increasing the probability of environmental disasters, and compromising the economic cycle continuity. Possibilities of restoring the ecological integrity of the basin, as a model of regeneration for the entire biome, an alternative occupation, and care for the land is proposed, in synch with the environment, and the ambition of a fairer country is sought after.
research questions and	Primary Research question: What is the new territorial form capable of synchronizing environmental, social, and economic interests in an exemplary zone for the regeneration of ecological integrity within the Tietê River Basin? Secondary Research questions: SQ1. What constitutes the urban form of the Tietê river basin? SQ2. What are the opportunities for ecological restoration aligned with economic development for site-specific environmental and social interests? SQ3. What are the exemplary zones for regeneration within the basin? SQ4. What kind of new urban form can meet the conditions for environmental regeneration and economic development within a specific exemplary zone? SQ5. How does the new urban form dialogue with new and existing landscapes, systems of production, and inhabitation?

design assignment in which these result.	Responding to the main and secondary research question, the outcome of the graduation work will reflect the role of landscape and urban designer in addressing social and environmental challenges through space. Some of the prospected outcomes which derive from the proposed questions are as follow: Secondary questions 1, 2, and 3: Documentation of the conditions of the basin and existing spatial networks of greenspaces, infrastructures and economy, through the Monograph Series proposed by the Transitional Territories Studio; Secondary questions 2, 3 and 4: Definition of criteria for the assessment of ecological integrity and key characteristics sought in exemplary zones; Secondary questions 3, 4 and 5: Definition of exemplary zones for ecosystem integrity regeneration within the region; Secondary questions 4 and 5: Development of the chosen zone as a pilot, establishing a new territorial framework capable of synchronizing environmental and economic interests; Secondary questions 4 and 5: Design of a set of spatial interventions related to the new territorial framework, on a multi-scalar basis (from the scale of the basin to the scale of the architectonic object);

[This should be formulated in such a way that the graduation project can answer these questions.
The definition of the problem has to be significant to a clearly defined area of research and design.]

Process

Method description

To obtain the necessary base knowledge of the site and its dynamics, the Monograph Series of the Transitional Territories Studio will be the starting point. The Series is divided into four sets on the present states of Matter, Topos, Habitat, and Geopolitics, providing a sufficient amount of entry-points to guide the process of development of the thesis, with further room for development after the conclusion of this phase.

Differing per line of inquiry, the methods of research and representation are various. Each line of inquiry presents three drawings, namely Composition, Alteration, and Limits, depicting

the baseline of a specific subject of interest, related to the set and the site. The cartographies are not limited to the elaboration of maps, but graphs, drawing sections, and any other kind of exploratory drawings as well.

The research is enriched by a literature review, supporting the drafting of the drawings and providing sufficient knowledge about the different domains of expertise which seem to be necessary at this point.

For the definition of criteria of the assessment of ecological integrity, specific literature will be evaluated, transforming general concepts into an assessment criteria which is responsive to the conditions of the site. These criteria would then be applied to selected exemplary zones within the Basin, which should be aligned with economic and environmental regeneration goals, as well as having enough data available for the continuation of more in-depth research.

Analytic maps should be produced to help in better understanding the potentials for the regeneration of ecological integrity within the specific exemplary zone, which then would lead to the construction of the spatial framework.

The spatial framework would be challenged and constructed by a series of scenarios – yet to be defined in quantity and method – which should put forward the challenges and disparities between design, social, economic, and environmental conditions within time. The design develops into a series of smaller-scale interventions, responding to local conditions of the landscape, culture, and climate, as well as pre-existing networks and land uses.

All of the above-mentioned steps undertake a design thinking process, which should be one of the base methods of this graduation work. It allows the designer to create different possibilities of choice during its analysis process, with convergent and divergent thinking hand in hand, forming a non-linear path forward. Focusing on the interrelations between seemingly disconnected concepts and subjects, design thinking frames and traces ties between different parts of the problem.

This process is supported by the analysis elaborated during the Monograph Series, as well as by the analytic maps which should be prepared for the evaluation of potentials and limits within the exemplary zones. These acts of mapping have the agency of creating possibilities for the research and design, followed by an unfolding of different projects, at varied scales, based on choices informed by the cartographies.

In other words, the Design Thinking process in this scale should be as follows: Analysis (Composition), or the creation of possibilities; Synthesis (Alteration and Limits), or the making of choices; Projection, or concrete design interventions proposed for the chosen zones.

As to the theories applied to the designs of the project deliverables, Landscape Ecology and Landscape Urbanism are at the base of the new extended urban landscape matrix, which will be applied to exemplary zones. Following the principles put forward by Richard Forman, with his publication “Land mosaics: the ecology of landscapes and regions”, where the basic

elements of a mosaic are presented, namely patches, corridors, and matrix. These principles and vocabulary will be used to draft the new urban matrix to the site, while the different patches, matrix, and corridors shall provide the specific, smaller scale, objects of urban and landscape design.

The distinct landscapes and exemplary zones should be connected by a network of relations between different systems, scales, and subjects. This constitutes an urban/peri-urban/rural transect of interventions, which should expose the fundamental trans scalar value of this graduation work.

Literature and general practical preference

Bacchin, T. K., Lafl eur, F., Sanchis, I. R. (2020). On Atmosphere, Water and Soil. Journal of Delta Urbanism, 1, 70-77

Bellacasa, M. P. D. L. (2010). Ethical doings in nature cultures. Place Geography and the Ethics of Care, Ethics, Place and Environment, 13 Escobar, A. (2011). Sustainability: Design for the Pluriverse. Development, 54, 137-140

Filho, N. G. R. (2010). Dois séculos de projetos no Estado de São Paulo : grandes obras e urbanização. EDUSP.

Forman, R. T. T. (1998). Road ecology: a solution for the giant embracing us. Landscape Ecology, 13(4).

Forman, R. T. T. (2006). Land mosaics : the ecology of landscapes and regions. Cambridge University Press.

Forman, R. T. T. (2008). Urban regions : ecology and planning beyond the city. Cambridge University Press.

Forman, R. T. T. (2014). Urban ecology : science of cities. Cambridge University Press.

Marot, S. (2021). Taking the Country's Side: Agriculture and Architecture. Polígrafa.

Makarieva, A. M. and Gorshkov, V. G. (2007) Biotic pump of atmospheric moisture as driver of the hydrological cycle on land, Hydrology and Earth System Sciences, 11(2),1013–1033

Mollison, B. C. (1996). Permaculture : a designer's manual. Tagari Publications

Schreefel, L., Schulte, R.P.O., de Boer , I.J.M., Pas Schrijver, A., van Zanten, H.H.E. (2020). Regenerative agriculture – the soil is the base. Global Food Security, 26

Waldheim, C. (2016). Landscape as urbanism : a general theory (Ser. Book collections on project muse). Princeton University

Wurtzebach, Z., & Schultz, C. (2016). Measuring Ecological Integrity: History, Practical applications, and Research Opportunities. BioScience, 66(6), 446–457.

Victor, M. A. M., Cavalli, A. C., Guillaumon, J. R., & Filho, R. S. (2005). One Hundred Years of Devastation. Revisited 30 years later.

Exemplary work of reference:

Caldera, R., Luciano, E., Yehia, Y. (2019). Just Transition. Master Thesis. The Architectural Association School of Architecture.

Lafleur, F. (2016). Re-Territorialization: A vision for Milan Urban region. Master Thesis. TU Delft.

Myserli, A. (2018). Re-Natured Economy: From pollutants to productive landscapes. Master Thesis. TU Delft.

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)?

The thesis project is linked to the main subtitle of this year's studio "Inland, Seaward" as it focuses on the transition from water to land, on several different scales, levels, and forms. From ocean to river basin, from basin to stream, how water and its territory are shaped and have been disrupted along the course of almost 200 years of occupation in the Tietê Basin presents challenges to the future conditions of urban projects in the riverine areas.

One of the ultimate goals of the thesis, a landscape urbanism design proposal, would address the interrelations between urban and rural, natural and anthropic, political and societal. Building on the leading hypothesis from the studio "the territory is a shared project – independently from scale – wherein the urban always co-constructs with nature" the design would benefit from in-depth research of the natural conditions of the site, following the Q6 joint research phase of the studio.

The relation to the Urbanism feels clear, as the field sits at the intersection of many other areas of expertise, offering to translate to space interventions, methods and practices put forward by other domains, e.g. agriculture, landscape design and forestry (in the case of this graduation work).

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

The Basin was developed through the course of almost two centuries from a place of agriculture extraction, followed by a period of intensive production and transformation of

riverscapes by the construction of hydropower plants, and now presents an increasing economic and energetic dependency on extraction. With the exploitative production of sugar cane by monocultures, the changes in land-use patterns in the region and other neighboring areas (The Amazon and Atlantic Forest) are disrupting micro and macroclimates. Shifting rainfall patterns across the continent, heatwaves, fires, and the intensive use of pesticides in the latifundia contaminating groundwater and aquifers are just a few within the constellation of environmental and public health crises of the site. The graduation work aims at handling these issues in proposing alternative land-uses and the landscapes that are formed by them, supporting alternative methods of production.

Another important aspect which would be tackled by the work is the ever-shrinking availability of land for food production by small farmers, who are responsible for really feeding the country. Due to the increasing dependency on commodities, hence the expansion of land occupied by monocultures, the Brazilian government expects that the plantation of rice, beans, and cassava (which form the basis of the Brazilian diet) should lose 2 million ha. until 2030, making room for the expansion of soy, corn, and sugar cane. This is a threat to the wellbeing of our country as a whole, as healthy and nutritious food would become ever more scarce and expensive, while the country is headed back towards a scenario of hunger and misery for the benefit of huge agribusiness corporations. Therefore, the societal gains of implementing alternative patterns of land-use, associated with less-harmful agricultural practices could be enormous.

As the new climate of extremes increasingly becomes a reality, spatial patterns of production and inhabitation must be adapted to better use natural resources and respond to extreme disruptive events, but also be innovative in exploring ways of maintaining and distributing economic prosperity, diminishing social and climatic injustices.

The graduation work looks for possibilities of designing for economic stability, in synch with the environment and welfare by reinterpreting the land-use patterns in the region. In the case of this project, this would be translated to a multi-scalar landscape urbanism proposal capable of providing insights into an alternative future for a land that has been shaped in form and content by the exploitative use of soil. This would be a valid addition to the professional field of Landscape Urbanism, as it explores different ways of occupying the land, responding to a multitude of challenges by the establishment of multi-functional landscapes.

Lastly, the relevance to the scientific framework is clear by applying already existing methods and concepts to a large area of the Basin, with all the associated social and economic benefits. The proposal could help in demonstrating that solutions that rely on green and blue infrastructures considering endemic conditions could easily be an economic alternative to monocultures. Besides, the additional benefit of once sterile, monofunctional landscapes performing as green and blue infrastructures could help mitigate climate extremes and regenerate the ecological integrity of the Basin, avoiding a worst-case scenario of climatic disaster.