

Graduation Plan

Master of Science in Architecture, Urbanism & Building Sciences

MSc Landscape Architecture 2024 - 2025

Julia Esser



Graduation Plan

I Personal information	
Full name	Julia Esser
Student number	6056768

II Studio / Lab information		
Name / Theme	Landscape-Based Urbanism	
Main mentor	Steffen Nijhuis	Landscape Architecture
Second mentor	Sophia Armpara	Urbanism
Argumentation of choice of the LA graduation lab	<p>My interest in the urban environment stems from the simple fact that I am a “city person” at heart. However, the numerous benefits of living in cities often come at great costs for the underlying ecosystem and a detachment from the existing landscape. This conflict between city and landscape inspired my desire to work on bringing the two closer together throughout my studies. Therefore, exploring the framework of landscape-based urbanism feels like a natural step in my journey toward becoming a landscape architect. The opportunity to work on a relevant, ongoing project that embodies the idea of exploring the future of urbanization further motivated my lab selection.</p>	

III Graduation project	
Title of the project	Between Mountains and Mangroves: Designing a Gradient City
Context and aim of the project	
Location	Nusantara (East Kalimantan, Indonesia)

<p>Problem statement</p>	<p>Urbanization is a complex process associated with a multitude of environmental, social and economic challenges. As Nusantara is a planned capital built from scratch, tremendously fast urban growth in a previously sparsely occupied location, is expected. Therefore, the interaction of this development with the landscape and the underlying ecological and cultural systems comes to the forefront of the problem field. The following points address challenges that are likely to occur and intensify as a result of current construction and planning methods.</p> <p>Current Planning</p> <p>Nusantara is supposed to become a global, forest city that is "designed according to nature" (<i>Ibu Kota Nusantara</i>, 2021). This is the promise of the city planners and the government. While the project indeed presents a wonderful opportunity to conduct such an experimental design on a large scale, several concerns regarding the planning and execution started to arise after construction began in 2022. Particulcrly subjected to debate has been the disruption of mangrove ecosystems in the bay and the relocation of multiple Indigenous communities.</p> <p>To understand why these issues occur a case study evaluating other planned capitals (Brasilia, Islamabad and Abuja) was conducted. The case study revealed that rigid planning and lack of consideration for natural and cultural processes coupled with constrained construction timelines result in multiple ecological and social issues in planned capitals. For example, in Brasilia, the form-driven design resulted in landscape fragmentation causing the decline of natural water recharge systems (Greco & ICLEI World Secretariat, n.d.). A number of these patterns can be seen in the current planning of Nusantara which explains some of the ongoing issues. Therefore, a new more flexible, process-oriented planning approach that considers the natural and the cultural context can help to achieve the promised vision.</p> <p>Landscape Fragmentation</p> <p>Nusantara's development site is situated on the island of Borneo, between monotonous ranges covered with rainforests and coastal lowlands with mangrove fringes. Various plots of rainforest, mangroves and protected nature reserves are currently separated by large strips of logging concessions and agricultural plantations (see figure 1). In many cases, agricultural activity degrades the nutrient-poor soils of Borneo leaving behind patches of land unsuited for further cultivation or reforestation. An urbanization project at the scale of Nusantara, which expects a population of roughly 2 million people by 2045, could contribute to a further division between</p>
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the habitat patches (Bambang, 2019). Fragmentation affects “functional connectivity of landscape through species movement” which is crucial for rainforest succession and regeneration (Ocampo-Peñuela et al., 2020).

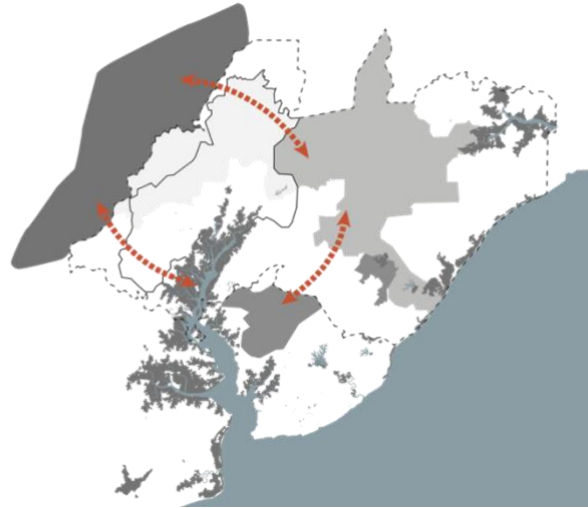


Figure 1: Landscape Fragmentation in Nusantara. Agriculture is shown in white, remaining nature in shades of gray.

Disruption of Landscape Gradients:

Landscape gradient theory emphasizes the importance of transitional zones between ecosystem typologies highlighting the idea of landscape continuity (McGarigal & Cushman, 2005). These transitional zones often exhibit unique characteristics and display increased biodiversity (Araújo, 2002). In the case of Nusantara many of the landscape gradients, such as the transition from rainforest to mangrove, valley to mangrove, and monotonous rainforest to lowland rainforest, are already affected by fragmentation. The development of Nusantara directly affects the transitional areas mentioned above (see Figure 2). The extensive urban area poses a risk of transforming already weak transitions into barriers.

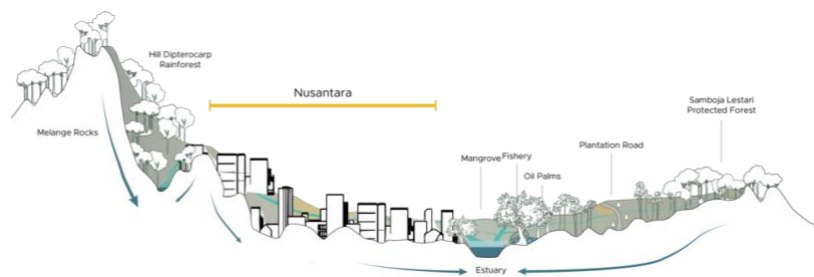


Figure 2: Nusantara's site on the gradient

<p>Research question(s)</p>	<p>Research Question:</p> <p>How to design an integrative landscape framework that regenerates natural gradients and supports the socio-ecological urban development of the new capital Nusantara?</p> <p>To answer this question, the following sub-questions provide a research structure and will be addressed by means of design exploration and research through design.</p> <p>Context and Understanding</p> <ul style="list-style-type: none">What are the ecological and cultural landscape characteristics and gradients of the region and what opportunities and challenges can be identified regarding its current state and its transformation into an urban landscape? <p>Design strategies and Principles</p> <ul style="list-style-type: none">What spatial design strategies and principles can be derived from the concept of landscape gradients to enhance landscape ecological connectivity and socio-culturally inclusive urban development? <p>Design Application</p> <ul style="list-style-type: none">How can the design of an integrative landscape framework be applied at multiple scale levels to regenerate natural gradients and support the realization of an eco-culturally diverse new capital? <p>Reflection and Conclusion</p> <ul style="list-style-type: none">What lessons can be learned from the application of a landscape-gradient-based urbanization approach?
<p>Design assignment</p> <p>The gradient concept of the landscape provides a unique insight into the relationships between ecosystems and people and highlights their continuity. Therefore, to design with gradients means to design with processes and transitions. The theory of landscape-based urbanism provides insight for designing with natural processes as a guiding principle for development and can therefore help to translate the knowledge of the local gradients into spatial design strategies.</p>	

Figure 3: Conceptual design framework

As gradient transitions change with the scales from large connections to site specific processes, so will the design. This approach helps to explore the potential of gradient-based design in various spatial dimensions.

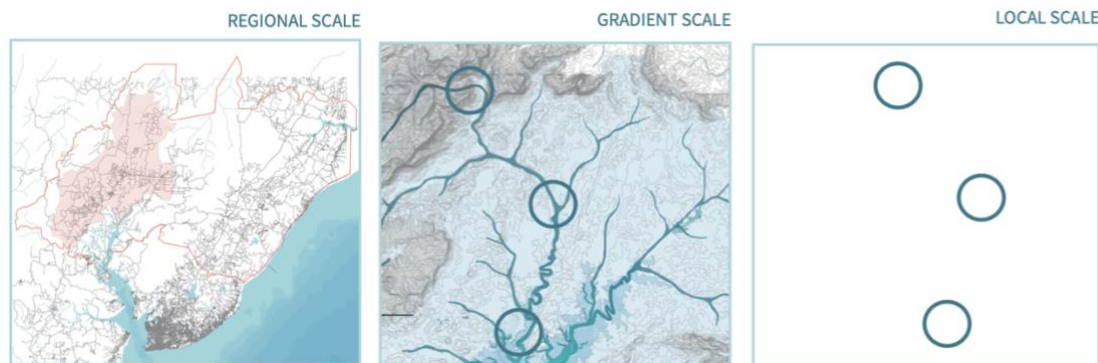


Figure 4: Design Approach

1. Regional Scale Design Vision

A large-scale design vision is built on a combination of the design principles and site-specific analysis. The vision will indicate a flexible, process-oriented zoning strategy for the future city.

2. City-scale Plan

A design on the metropolitan scale, along gradients highlighted in the vision masterplan. Processes and interactions between landscape and urban typologies are highlighted through appropriate representation methods such as sections and axonometries. A sectional model will be used for design experiments and to showcase gradient urban transitions.

3. Local Scale – Key Projects

This part of the design zooms in into the metropolitan scale gradient design of most important locations with emphasis on showcasing spatial quality and landscape relations. The zoom ins will focus on transitional areas which represent the gradient concept best.

IV Graduation process

Method description

Q1- Context and Understanding

Mapping

Gaining an understanding of the landscape and its systems by making synthetic maps. A structure map will be created to highlight defining landscape elements. A challenge map will pinpoint areas of attention and provide initial design clues

Layer Analysis

The analysis of the landscape structure will make use of the landscape layer approach to study the relationship between landscape elements. The analysis layers look at water, ecology and culture.

Sections and Transect

To visualise gradient landscape transitions sections will be used. When visiting the site, a transect of each ecological zone will be drawn to better understand gradient landscape transitions.

Multi-Scalar Analysis

The mapping and drawing of sections will represent different scales. First the regional scale will be studied to recognise underlying landscape systems. Then the gradients will be studied in a zoomed in scale. Lastly the processes and conditions for the gradients will be studied in the local scale.

Analysis through time

To understand the conditions for landscape restoration a look back at the undisturbed ecological system in comparison to today's situation is helpful. Major changes to the natural systems on Borneo started happening in the 1970s, so this will be the assumed timeframe.

Q2- Design strategies and principles**Case study**

The study of relevant examples on landscape connectivity, landscape gradients and water sensitive design can provide valuable design principles.

Indigenous Practices

The understanding of how indigenous people live with the landscape can provide a basis to developing design principles that are ecologically and culturally sensitive.

Literature Review

To find further design principles literature on landscape connectivity, designing with gradients and water will be studied and interpreted to the project's context.

Q3- Design application**Multi-scalar design**

The design will be applied to multiple scale levels to tests it feasibility and spatial quality.

Flexible Masterplan

The large-scale masterplan will leave room for change and growth. Seen from the study of other purpose-built capitals a fixed masterplan often fails to adapt to future population demand.

Modelling

To better visualise the design interventions and experiment with spatial possibilities a sectional model of the site will be made.

Literature and more applied references

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V Reflection on the project proposal

1. What is the relation between your graduation topic, the lab topic, and your master track?

The topic of my research captures the theme of the graduation studio by highlighting the importance of landscape as a guiding force for urban processes. By focusing on landscape gradients as a formative design element for urbanization, the intrinsic relationship between people and the landscape becomes visible and experiential. This idea of creating landscape experiences has been a personal takeaway from the master track. Translating indigenous practices of living with the gradients can help to bring the experiential aspect of giving to and taking from the landscape into the design.

How the understanding of landscape systems can be interpreted into a design, has been a central question of both the master track and the design lab. The gradient concept of landscape helps to capture and highlight the complexity and process-driven nature of landscapes. This helps to move away from binary thinking in the early stages of analysis, allowing for the integration of processes into the design from the beginning.

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

The research touches upon several ongoing discussions in the field of landscape architecture. It questions the very idea of how people can co-exist with the landscape even in urban environments, which is an increasingly relevant topic, especially with regard to climate change. As urbanization is becoming a more urgent matter, the opportunity for experimentation presented by this project can provide valuable insight for the future. By beginning to shift the ideas on what urbanization should look like, little by little, the future of the city will begin to change. This is surely a topic that will accompany landscape architects in the years to come as our cities begin to change.