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

<table>
<thead>
<tr>
<th>Name</th>
<th>Ayu Tri Prestasia</th>
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<tbody>
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### Studio

<table>
<thead>
<tr>
<th>Name / Theme</th>
<th>Flowscapes</th>
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<tbody>
<tr>
<td>Teachers / tutors</td>
<td>Inge Bobbink, Marjolein Spaans</td>
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<tr>
<td>Argumentation of choice of the studio</td>
<td>Landscape Architecture Studio</td>
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### Graduation project

<table>
<thead>
<tr>
<th>Title of the graduation project</th>
<th>The Living Estuary</th>
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<tr>
<td></td>
<td>A study of developing a landscape spatial adaptive strategies to integrate the water dynamic, ecosystems dynamics, and anthropo-dynamics in the estuary of Volta Delta, Ghana</td>
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### Goal

<table>
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<tr>
<th>Location:</th>
<th>Volta Delta Region, Ghana</th>
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<tr>
<td>The posed problem,</td>
<td>1. <strong>COASTAL EROSION</strong></td>
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<td>The construction of Akosombo dam in 1961 trapped significant amount of sediment form Volta river to the delta. Along with the sea level rise, it caused severe erosion in Ghana’s coastline. The coastal erosion cause floods &amp; salinization that affect the livelihood of the local communities, especially the agriculture sector. The mangrove deforestation for firewood makes the coast and the riverbank more vulnerable from the flood and erosion. The existing coastal protections were built fragmentarily and didn’t take account the ecological service in the system, while in this dynamic situation, the integration of natural processes in the coastal protection system by a healthy ecosystem could help to create better protection for the coastal communities.</td>
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2. **URBANIZATION AND NATURE BALANCE**
   The challenge of high rate of population growth, industrialization to exploit the natural resources more, and no long-term planning available for the estuary of Volta Delta makes the urgency to formulate adaptive design strategy for sustainable development in the future.

<table>
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<tr>
<th>research questions and design assignment in which these result.</th>
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<tr>
<td>How to develop landscape architectonic design principles for a future adaptive strategy to integrate water dynamics, ecosystem dynamics, and anthropo-dynamics, to enhance spatial and living quality in the estuary of Volta Delta? Context, theoretical framework, site analysis, design principles, plausible future scenarios, adaptive design strategy, detail design, reflection</td>
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**Sub Research Questions:**

1. How are the current systems of the water dynamics, ecosystem dynamics and anthropo-dynamics in the Volta Delta Estuary?
   - How did the estuary develop before and after the construction of Akosombo dam?
     (focusing on the natural dynamics and processes)
   - What type of ecosystems comprise the Volta Delta estuary, and how can they be utilized as coastal protection?
   - What are the main economic activities of the local communities, and how do they influence the land use and spatial pattern in the estuary of Volta Delta?

2. What design principles could be derived from the interrelation between the water dynamics, ecosystem dynamics, and the anthropo-dynamics of the Volta Delta’s estuary?

3. How to develop future scenarios for the Volta Delta estuary?
   - Which variables should be taken into account in developing the scenarios?
   - What strategies need to be applied in each scenario?
   - What are the most plausible future scenarios for Volta Delta estuary?

4. How to develop design strategies in the most affected areas by applying the design principles of the integration between the water dynamics, ecosystem dynamics and anthropo-dynamics?

5. What spatial and systemic detail designs could be applied on the affected areas?

6. Could the strategy create a framework which can be applied in other delta regions?
1. **INVESTIGATION**
   a. To start the research, the Volta Delta Estuary will be analyzed in 3 main-process aspects, the water dynamic, ecosystem dynamics, and anthropo dynamic.
   b. The interrelation between these aspects will derive design principles which will be applied in some selected location in the estuary

2. **SCENARIO BUILDING**
   a. Variables consist of constant variable, independent variables and dependent variables will be used to develop 3 extreme scenarios. The scenario building aims to study possibilities of spatial development in the next 50 years in the estuary based on the combination of some variables.
   b. The No-regret scenario will be developed as consensus model based on the three extreme scenarios.
   c. Adaptive design strategies will be developed from the No-regret scenario.
   d. The most affected areas will be determined and some location with different characteristics and spatial configuration will be selected.

3. **IMPLEMENTATION**
   a. The design principles which were determined as the result on investigation stage will be tested on the selected location to produce detail designs

4. **REFLECTION**
   a. In the end, the possibilities to apply the strategy as a framework on the other delta regions will be studied.
   b. Reflection regarding the findings along the whole research process will be discussed.
Literature and general practical preference


Reflection

Relevance
This graduation project is intended to research the possibilities of developing landscape design, to optimize the ecosystem services as means to balance the delta dynamics, and to improve the living quality of the local communities in a developing country’s delta region. The complexity of social and economic challenges in applying the design strategy will also be studied in order to propose a future sustainable solution.

Landscape architecture design could play a role to enhance the living quality of the local communities by improving the balance between human and nature systems.

Time planning

- P1 (Project Hypothesis, Site Analysis, Approach)
  - site selection
  - initial site analysis & problem statement
  - research questions
  - approach and initial theoretical framework
  - initial research methodology
  - Workshop and site visit

- P2 (Diagnosis & Theoretical Framework)
  - Elaborated site analysis
  - Design experiments to formulate design principles
  - Methodology (Theoretical framework, research framework and methods)
### Initial Scenario Building stage
- Initial Conceptual Design strategy
- Draft Report 1 (Problem statement, Site Analysis, Theoretical Framework, Methodology, Initial Scenario Building stage)

#### P3 (Future Scenarios & Adaptive Design Strategy)
- Developing scenarios, determining the most affected area
- Experimental models
- Estuary scale design strategy
- Elaborated design for the selected areas, with initial plans, sections and perspective drawings
- Draft Report 2 (Completion from Draft Report 1 with initial description of the design)

#### P4 (Final Design)
- Detail Design (Local scale) – elaboration with plans, sections and perspective drawings
- Reflection: Design value (ecological, social, economic)

#### P5 Public Presentation

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**Investigation**
- Site selection
- Initial site analysis & problem statement
- Research question & sub-research question
- Initial theoretical framework
- Initial research methodology

**Workshop & Site Visit**
- Initial workshop with TU Delft Civil & TPM Departments and Ghanaian Universities students
- Discussion with local stakeholders in Volta Delta
- Site visit (general in Volta Delta Region)
- Interviews with local people in Fuvemeh

**Scenario Building**
- Elaborated site analysis
- Design experiments to formulate Design Principles
- Methodology (Theoretical Framework, Research Framework and Methods)
- Developing Scenarios
- Initial Conceptual Design
- Draft Report 1 (Problem Statement, Site Analysis, Theoretical Framework, Methodology, Initial Scenario Building)

**Design Principle Implementation**
- Developing scenarios, determining the most affected area
- Experimental Models
- Estuary scale design strategy
- Elaborated design and development strategy for some selected areas
- Draft Report 2 (Completion from Draft Report 1 with initial description of the design)

**Reflection**
- Complete detail illustration of the designs
- Reflection: Design value (ecological, social, economic)
- Physical Model
- Report

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<th>P2</th>
<th>P3</th>
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<th>P5</th>
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<td>Sept</td>
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