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:

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| Argumentation of choice of the studio | Speaking of the influences that climate change would bring to coastal areas, it’s essential to consider another possible scenario other than the rising sea level, which is the opposite and could possibly take place on the coastline of Norway in the next century. For now, the changing climate has already lead to the migration of human, flora and fauna population. How do we design with changes? If the circulation of human, commodities and datas would make the sea a territory as the land, which means the boundary between nation-states, or even between land and sea is blurring, how to achieve adaptive design for human communities and explore a futuristic scene of coexistence among human beings, flora and fauna? How to maintain this sense of belonging? Or does it even matter by then? These are questions that come to me again and again.

The Delta Interventions Studio could offer this possibility to let me research on the diverse scenarios caused by climate change and design with these changes. |

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On the other hand, the changing climate are causing a shifting in the pilar industry of Norway which is fishery. Especially for the southern coast of Norway, the main commercial fish species are migrating northward, and the changes in sea level would increase the unstable environmental risks in the coastal areas. These are all the elements that would cause a domestic migration of local communities.
Main research question:

How would the potential “new land” which emerges with the changing sea level accommodate the migratory human, flora and fauna populations, thus reshape the landscape of coexistence on the coastline of Stavanger Peninsula?

To make it more specific and tangible, and with the intention of focusing on certain key elements for the development of this area, I would split the main research question into several sub-research questions categorised in the following three dimensions:

**Environmental:**

1. What are the main environmental driving forces for the changes in sea level in Norway?
2. As one of the many driving forces, what are the changing trends in the temperature of sea water until the next century?
3. What are the changing trends in the flow of air which would affect wind and tide and bring storm surge to the Stavanger Peninsula?
4. What are the changing trends in the precipitation amount in the city of Stavanger which is the most populous area in this region?
5. What is the status of the submarine typography in the Stavanger Peninsula and its meaning to the coastal municipalities?
6. What is the status and changing trends of the occupation of vegetation within this area?
7. What are the soil conditions which include PH value, moisture content, physical state and construction capacity, etc. along the coastline of Stavanger Peninsula?
8. What are the status and changing trends of the occupation of vegetation
9. What are the status and changing trends of the maritime species within these waters?
10. What are the changing trends in the migration of flora and fauna in the Stavanger Peninsula?
11. How would the “new land” emerged in the Stavanger Peninsula accommodate the migratory flora and fauna?

**Societal:**

In the societal dimension, the emphasis will be on the migration of the population driven by climate change directly or indirectly:
12. If they are going to settle on the “new land” in Stavanger Peninsula, where are they come from? Why are they coming to settle here?
13. If the local residents are moving out of this region, what are the reasons that push them away?
14. How would the “new land” emerged in the Stavanger Peninsula accommodate the immigrating human population?

**Economical:**

In the economical dimension, I would focus on the pilar industry of Norway which is fishery, and it is essential and inevitable that the transition in this industry has an intense interaction with the migration of people who involve in this industry. So the question would be:
15. What is the changing trends in the fishing industry and how does that relate to the changing trends in environment and society?

design assignment in which these result.
Three scales:
1. Territorial (macro)/Regional scale — in this project, the design assignments in regional scale will include developing positioning and revival strategies for the coastal areas in the province;
2. City scale — in this scale, the coastline of the Stavanger Peninsula will be chosen as design sample. Developing strategies related to the relationship between coastal area and the whole city and the specific design on coastal area will be emphasised;
3. Local (micro) scale — analyses on this scale are to showcase the intervention strategies which could influence the interactions and relationships between land and sea, human beings and other species.

**Developing Policies** on macro scale:
The interventions on territorial or regional scale would act through a spectrum of developing policies concerning adaptation planning against environmental change, constructing a network of sharing, accommodating migrating human, flora and fauna populations, etc.

The design of **Amphibious Urbanisation Model** on micro scale:
The design would start with amphibious urbanisation modes which composed of a series of urban and architectural interventions. Then the modes would be applied on specific sites along the coastline of the Stavanger Peninsula. Then the flexibility or spatial variability of these modes could be tested through the resilience of each specific site.

**Process**

**Method description**
**System Analysis** — By collecting and organising physical and geographical informations and datas of the site through several systems, a relatively profound understanding of the context should be achieved.

**Observing & Interviewing** — In this specific project which estimated to take place in Norway, I prefer cycling, photographing and interviewing along the whole southwest coastline from Bergen to Kristiansand, so that the first-hand information regarding the life style in these coastal municipalities could be collected.

**Modelling** — After that basic understanding of the project site, I could understand more profoundly about the physical condition of the intervention site through modelling, both physical and digital.

**Literature and Case Study** — In the whole process, literature reviewing and case studying to learn more about the historical and cultural contexts of the site will always be necessary.

**Design** — Only after all these processes above, I may begin with the design part which would consist of five steps in a gradually developing sequence: brainstorm, conceptual design, schematic design, developed design and finalised design. Maps can be one of our most powerful tools in changing humans’ understanding of the ocean. By depicting the Earth as an interconnected ecosystem, with land and ocean mutually dependent, they can effectively reveal that biodiversity, geology, and the need for resource protection do not stop at the shore.

**Implementation Feasibility Analysis** — The final step would be implementation feasibility analysis which would help to test the implementation feasibility of the whole design project.
Literature and general practical preference

Theory about ENVIRONMENTAL trends (sea level projection) in Norway
The following reports or documents provide basic information about the climate relevant issues in Norway:

Documents about the ECONOMICAL trends (including traditional fishing activities and modern fishery) in Norway
The following reports or documents provide basic information about the evolution of fishing industry in Norway:

Documents about the SOCIETAL trends (including migration) in Norway

Relevant Literatures
The following literature concerns urbanisation and human society:

Practical Preference
The following project consists of a ‘co-location’ of aquaculture amongst offshore wind farms as a more considered approach to food production. The new aquaculture industry benefits coastal communities who have been impacted by the installation of these new infrastructures, aiming to offer an alternative to the fishing practices that have been severed.
“Farming the Common Sea”, Emily Temperton @ RCA (Royal College of Art), ADS6


Relevance

The main intention of the Delta Intervention graduation studio 2017-2018 is to research on the landscape and built environment in transformation within the special context of North Sea, to build with changes, to breakthrough limits, to explore projects. The North Sea is more than just a vast area of waters, but also a potential field for the events of human and non-human existence.

Climate change & Sea level

With the sustained impacts of climate change, and the corresponding effects of post-glacial rebounding, a persistent sea level change continues to affect the countries within the North Sea region. These changes could indicate new threats or opportunities to human society. According to the synthesised datas of historical and current mean sea level from satellite altimetry, and projected sea level in the Fifth Assessment Report (AR5) of the Intergovernmental Panel for Climate Change (IPCC), in the specific case of Norway, people may not worry too much about the influx of sea water to their community. For the vertical uplifting of Earth’s crust after the melting of continental glaciers released the loads is even more decisive than the rising rate of sea level. Although, the changes in projected relative sea level until 2100 are different, depending on different locations, the report also addressed that there are lots of uncertainties lie in the trends of sea level change, especially in such a long period.

Climate change & Migration

Think about butterfly effect, even one sole simple change would have enormous effects, not to mention the rising temperature brought by global warming. In the specific case of Norway, the rising temperature in sea water has become the driving force of the migrating of certain fish species which are used to habitat or spawn in colder water. Furthermore, the migration of these species could cause the migration of other fauna and human communities.

Sea level & New land

Take one of the many scenarios as a precondition, which would be the sea level along the coastline of Norway keeps on dropping until the next century, a long and narrow area of marshland which connects the sea and inland mountainous areas revealed. In the circumstance that most countries in the North Sea region are busy dealing with flooding from the sea, this spectrum of ‘new land’ seems more precious. It could be a new opportunity for human settlements, but in the mean time, it is definitely not just living space, or potential urbanisation field for humankind.

New land & New mode of urbanisation

The land which used to be washed and filled with sea waters was a habitat for maritime species, and good harbour for small fishing vessels of fishermen is now dominated by rocks, salty marsh vegetations, organisms, seabirds, and occasionally visited by human beings. Thus, I wish the city we live in could act like a crocodile, she should have the quality of the amphibious. In this case, the boundary of ‘land’ and ‘sea’ blurs in a harmonious scene of sharing the same space among all the species through time. It could accommodate the migrating populations properly and provide them a sense of belonging. Time would be the witness of this natural succession on this ‘fluid ground’.

Societal and Ethical relevance
According to reliable source of information (UDI), the number of asylum seekers arriving in Norway drops by 95% since 2016 which they called refugee crisis. This fact has already caught the attention of certain human right organisations. It seems like this country is becoming more and more inhospitable to immigrants. But, the paradox is that the whole country is now facing a severe problem of minus growth in population. The ageing population results in a shortage in labour force. Maybe the growing frequency in terrorism has lead to Norway’s harsh immigration policies. But simply shut down its open gate to immigration won’t do good to anybody. Not to mention that immigrants does not equal to terrorists. A mature reviewing mechanism towards immigration would certainly have positive effects on social stability.

**Time planning**