



Non-parasitic Economy
Towards a symbiosis between coastal cities
and water

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Towards a symbiosis between
coastal cities and water.

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Transitional Territories Graduation
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Reflection

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Aspect 1 The relationship between the project, the topic of Studio and Urbanism track

The topic of the Transitional Territories Studio this year is 'North Sea: Landscapes of Coexistence: A Topography of Chance', which looks at the interrelationship between land and oceans, studies and discusses the dynamics of nature and human society, and discussions leading to the current critical and means of various processes of the risk statement, and through research and design of buildings and urban projects to respond to today's biophysical, socio-economic, cultural and political changes and related risks.

My research project aims to explore the possible changes in the current economic production structure of coastal cities, introduce new bio-based economies, and transform it into sustainable production models in coastal areas so to achieve the systemic symbiosis between cities and water. From a topic perspective, it is closely related to the research theme of the entire studio.

Through the study and research of urbanism, I have deepened my understanding of the complexity of the city. In the past two years of study, I have been upgraded

and supplemented with both theoretical knowledge and analytical methods. These learning experiences have helped me explore the complexity of coastal areas and proposed measures to deal with uncertainty in my project. Through the internship project on Urbanism track, I learned the possibility of improving the spatial form and structure of cities and metropolitan deltas through the combination of landscape design and spatial planning. I was attracted by this method of combining urban and nature, this is also one of the reasons why I choose this studio.

In addition, my project also provided relevant research groups with a new perspective on "bio-based solutions". By applying bio-based solutions in water management, the water recycling in the region is improved to achieve the improvement of other cluster flows related to water, so to achieve a circular economy, and to gradually restore ecology in the area. Therefore, in my project, the issue of adapting to "bio-based solutions" in coastal urban environments was discussed, and some possible potentials were proposed, which could complement current research.

Aspect 2 The relation between the research and design

Climate change has and will continue to affect people's lives, and we can clearly feel that the impact of climate change is increasing. The risks faced by coastal cities will also increase in the future, but the unique characteristics of the North Sea environment continue to attract people gathering in these coastal cities, creating urban economic vitality. South Holland is a typical case. In order to promote economic development, the South Holland Province established Metropoolregio Rotterdam Den Haag (MRDH), which is also the project location. A series of economic activities deployments (port industry, green port, agriculture, etc.) caused damage to the local ecosystem, although many nature-based solutions have been discussed and tested in the Rotterdam region in recent years, the environmental problems are indeed severe, especially in water management. This phenomenon led me to rethink the relationship between the urban economy and the natural ecosystem. How to use polluted water as a medium through bio-based solutions to change the relationship between cities and nature to promote sustainable economic development and improve the adaptability of cities towards a systemic equilibrium. This is the original idea of the project.

In order to address my graduation project, several research processes were employed to build up the framework of my research. The research process includes three aspects. First, the Macro scale (MRDH) assessment is conducted. The ecological problems caused by water pollution in the area are studied, and the causes of pollution and the

risks brought by climate change are identified. The main contradiction between city and water dynamics was found through the assessment, and then four representative meso scale patches were selected for the second aspect of research. The second aspect is mainly to study the urban metabolism (flows) in contradictory areas. Bio-based solutions usually involve the concept of circular economy. Therefore, it is necessary to study the diverse systemic flows, by studying the flows in the area, it is possible to clarify the reasons for the contradiction in economic production and the adaptation potential of bio-based solutions. At the same time, in the second aspect, the space quality of the current vision was also evaluated and it was found that its space was not well adapted to bio-based solutions. The third aspect is to study the typology of contradictory areas from micro scale patches, a more detailed study of the types of water pollution in different typologies and the specific causes of these problems can be studied. This step of research is also the key to propose design strategies, because by design typology, bio-based solutions can be easily adapted at this scale.

As the conclusion of the research, three outcomes will be used to guide design testing, including: a preliminary revised regional vision, new spatial principles, and new typologies to be considered at planning and adapting the region. The design testing includes three conditions, industrial port conditions, logistics port conditions, and urban area

conditions. Through the design of a period scheme for land use, the goals of each transition period are determined. At the same time, it guides how to realize each new typology and the new urban space formed by integrating the typologies through the phased urban design of the three conditions. And the stakeholders who carry out the actions in each period will be identified. Last but not least, the feasibility of the design testing is verified by analyzing the

design's ability to respond to risks under different scenarios.

From this point of view, the relationship between the research and design in this thesis is directly integrated. The conclusions of the research can guide the direction of the design, and the design shows the process of realizing the research conclusion. At the same time, the research conclusions can also help to evaluate the design results.

Aspect 3 Methods assessment, Scientific relevance

The methods used in the research process and design section shows the scientific relevance of the project.

In the research part, the method mainly uses GIS analysis and mapping to assess the ecological problems and the causes of the problems in the region, and the risks they face, to understand the main contradictions in the current region, and to revise the current vision in conjunction with policy reading. In addition, transects analysis, flow analysis, typology analysis also helped me to understand the current urban spatial structure and urban metabolism in MRDH area,

through these research methods, I have a better grasp of the possibilities to application bio-based solutions in the region, later, a more reasonable design strategy is proposed.

In the design part, the period scheme of land use and the technical design integrated in the urban design can reflect the scientific relevance, such as the use of aquaculture to reuse and purify the port industrial facilities, digestion technology to treat community wastewater and other new scientific and technological interventions, also proposed new spatial principles.

Aspect 4 The transferability of the project results, Societal and Ethical relevance

Under the situation of variability on the climate change effects, coastal cities are undoubtedly facing the greatest risk. Due to the current socio-economic characteristics, not all coastal areas can meet the transition conditions, and the transferability of the project results expands the "bio-based solution", and provides new possibilities for guiding the transition of coastal urban areas. Just as the testing site of my graduation project, it has designed the transition process of each of the three conditions, as well as the symbiotic system of circular economy formed together.

For undeveloped land in the area, such as wasteland, grassland, etc., it is possible to allocate space resources in newly developed land directly based on space principles and typology strategies, build ecological networks, and integrate into the symbiotic system. However, for the adjustment or change of urban areas that have formed a spatial structure, more energy and time are needed to adapt to the new solution, and more stakeholders need to be considered.

Besides, the project provides possibilities for more jobs in the future, which can make up for the unemployment caused by the energy transition. For example, the marine culture in the port area, biogas energy stations, and the development of some emerging technologies all require a large number of people to complete. The proposal of the project not

only solved the problem of local economic transformation, but also proposed a strategy to gradually restore the local ecosystems. Therefore, the landscape structure of the city could also be changed, which may also cause some social equality issues. A better living environment and facilities will increase land prices and rents and cause pressure on low-income people. Of course, the project has also considered changes on people's lives to a certain extent. People no longer discard food waste, but collect it and put it into community biogas digesters to generate biogas; the rooftop agriculture and community agriculture allow people to get food more conveniently, which could reduce the cost of food transportation and pollution impact, but also promoted the interaction of people in the community.

From this perspective, the project has a strong societal and ethical relevance.

Aspect 5 Summary and limitation

The project also presents some limitations. Due to the limited space, bio-based solutions may cause conflicts between natural landscape, agriculture and housing development in the future. At the same time, in the early stage of project implementation, some stakeholders may not be able to accept these emerging technologies and lifestyle changes; at the same time, due to technological dishonesty, the price of renewable energy will be higher than traditional energy during the energy transition which will limit the development of the project. But in the long run, the project has greater flexibility that can deal with the uncertainties in the context of climate change.

Overall, throughout the thesis process, all the discussions and feedback have allowed me to critically reflect on my research and design process. The guidance and encouragement by Diego and Luisa, have kept me passionate and confident about the project. In addition, I also realized the importance

of clear narrative, which is also the aspect that Diego emphasizes in each discussion, which can help the audience better understand the main idea of the project. Through the thesis, not only has I improved my academic research skills, but also laid the foundation for my future career.