Reflection

The goal of this study was to find a balance of interventions Gouda can apply to remain sustainable in a changed climate. The vulnerability of Gouda to climate change is heavily intertwined with its location.

The city originated around a small peat river, lying in the middle of a large delta. Subsiding peat levels (Denslagen, 2001) and rising precipitation (KNMI, 2018), requires intervention.

The Delta interventions studio focuses on the balance of urbanisation, port-development, environmental qualities and flood defence, amongst other things. These factors are important issues in Gouda's adaptation to climate sustainability.

And Gouda is not the only city in this situation. These problems stem from the physical qualities of the land on which the cities are built, as well as historic Dutch building traditions, which all suffer from global climate change. With extreme weather events occurring more often (KNMI, 2018), cities become anxious about how to protect their monumental heritage during disasters when this same heritage often means large changes are forbidden.

This situation requires a solution, but Gouda's complex water system, with its many conflicting elements, as well as the many uncertainties present stopped this project in its tracks in an early phase.

Instead of progressing through the research to come to a design, research started to move sideways, spiralling into side paths. Several explored methodologies supported the project with specific issues, but none of them provided a structured approach, and it led to a lower quality, chaotic result.

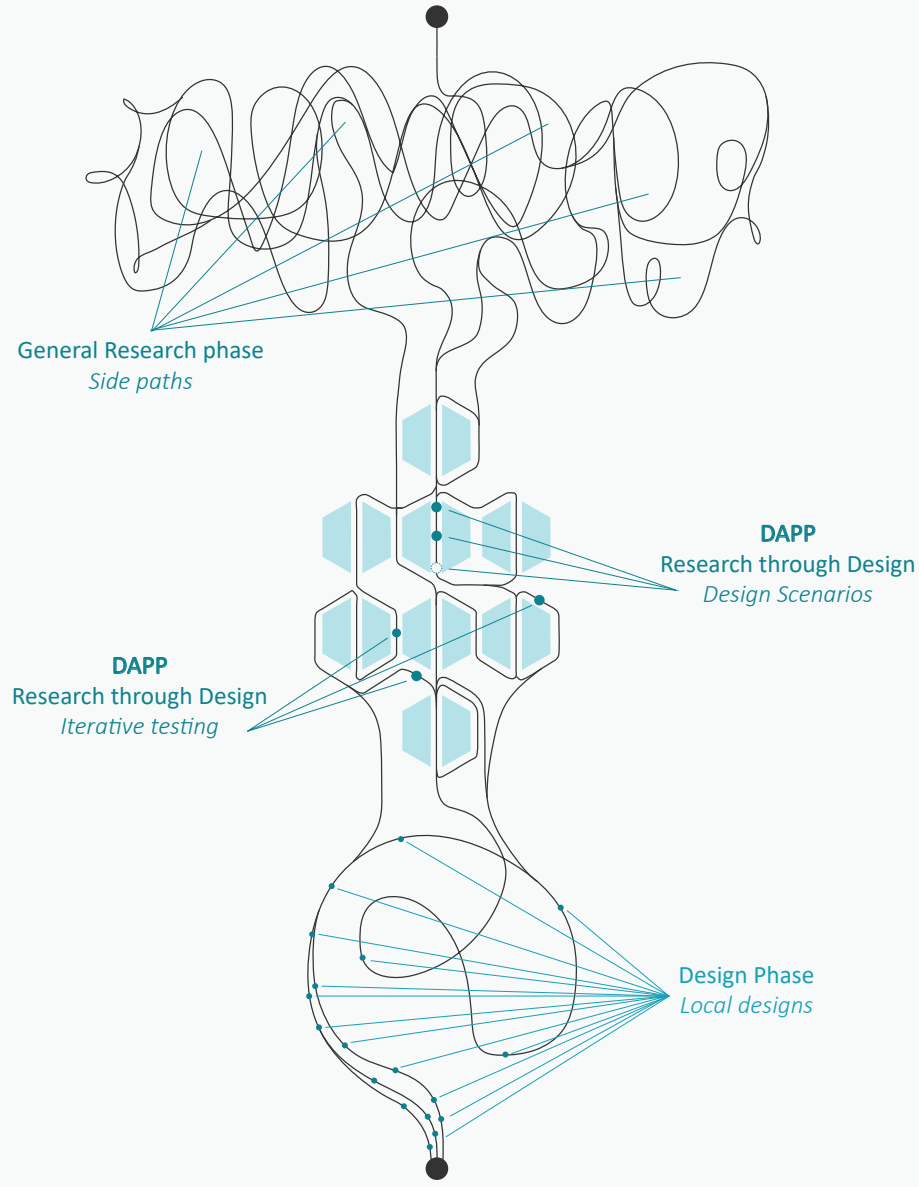

Figure 1. Structure of the research project

This asked for a more structured methodology, with a step-by-step progress that could be adapted for the specific situation in every phase. The chosen method (Dynamic Adaptive Policy Pathways) (Haasnoot, Kwakkel, Walker & ter Maat, 2013) included all of this, as well as a supportive strategy for uncertainty.

This progress involved iterative steps of analysis and design. It started with a general analysis, which developed into the creation of several interventions, which were used for research through design. These interventions consequently were tested and prioritized using technical (calculations) and social (workshops) methods.

One other disadvantage was that, due to the relatively late entrance of this approach into the project, the design phases did not always match up to the graduation program.

Using DAPP helped to structure this project, the overall planning as well as the decisions that had to be made at various points. The iterative elements then allowed me to look back at my project and tweak elements. This methodology covers climate uncertainty, and allows for some measure of stakeholder uncertainty, but there are some uncertainties in Gouda that are not taken into account, e.g. the lack of available knowledge of the foundations and sewers.

There were some mismatches between this study and the methodology, but the project needed a clear structure in order to move forward. Fortunately, the framework layout left enough space to adapt elements and steps to interlink more closely with the requirements for Gouda. One major example of an adaptation is the fact that this study results in a design with integrated pathway elements, instead of a planning approach.

Overall, the integration of uncertainty, climate change, cultural heritage, technological and spatial interventions will provide a plan different from what Gouda planned, but it aims to be a different way forward to integrate tradition and the future.

Denslagen, W. (2001). *Gouda: de Nederlandse monumenten van geschiedenis en kunst.* Zwolle: Waanders

Haasnoot, M., Kwakkel, J.H., Walker, W.E. & ter Maat, J. (2013). Dynamic adaptive policy pathways: A method for crafting robust decisions for a deeply uncertain world. *Global Environmental Change, 23*(2), 485-498. doi:10.1016/j.gloenvcha.2012.12.006

Koninklijk Nederlands Meteorologisch Instituut. (2018). Extreme neerslagsom in Herwijnen. Retrieved May 9th, 2018 from http://www.knmi.nl/kennis-en-datacentrum/achtergrond/extreme-neerslagsom-in-herwijnen