

P2 GRADUATION PLAN

CLIMATE- RESILIENT HOUSING SOLUTION TOOLBOX & ARCHITECTURAL DESIGN

**Research on the transferability of climate- resilient strategies
and measures for housing typologies in the Dutch Delta
and the Vietnam Delta**

Delft University of Technology, The Netherlands
Master of Architecture, Urbanism and Building Sciences
Master track of Architecture
Studio Delta Interventions
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Theme	Transferability of knowledge, Dutch Delta, Vietnam Delta, climate- resilient design, water-proof Architectural design
Teachers	Kristel Aalbers (Architecture) Jan van de Voort (Building Technology) Han Meyer (Urbanism)
Argumentation of choice of the studio	Facing the significant issues of problems with flooding problems of my family in New Orleans and witnessing the problems with flooding during my period of exchange in Japan in 2013. Thus my personal urge to emphasize the importance of Delta Interventions and the role of the transferability between two different Delta Worlds, which results in an expansion of the existing Architectural climate proof design catalogue has risen since.
Title of the graduation project	CLIMATE- RESILIENT HOUSING SOLUTION TOOLBOX & ARCHITECTURAL DESIGN Research on the transferability of climate-resilient strategies and measures for housing typologies in the Dutch Delta and the Vietnam Delta

Problem statement

Global climate changes are an unescapably discussion today. Our history is showing us the constant need to move along with this changing stream of life (Seneca, 2013).

I witnessed the sad consequences of flooding problems due the Tsunami in Sendai, during my exchange period in Japan one year ago. Frequently the Japanese students asked me about the knowledge of the Dutch Delta. On those moments I felt ashamed that I couldn't answer such questions, while I've had the luxury to learn from the environment my parents raised me in. Facing the problems of this sad disaster has been the start of my graduation project and also the start of many questionings about the knowledge of the Dutch Water Management. From this point I became fascinated by the Delta Worlds, it's danger but yet so beautiful.

Global climate change is commonly known as global warming and related to sea level rise. Global climate change is a significant and lasting change in the statistical distribution of weather patterns over periods ranging from decades to millions of years (IPCC, 2001).

The Dutch water regime as a whole is considered problematic relating to climate change (Delta Committee, 2008). Thus new insights has led to a call for new policy, which was formulated with great urgency in 2003 (Bobbink et al, 2011). The need for Delta Interventions are not just an issue in

the Netherlands, but it is a significant issue of the entire world and the urge for a new water management approach has risen (Wageningen World, 2010). With the new approach and need for review of the water management system in the Netherlands it is important to seek, develop, learn and collaborate with partners from out different expertise as well in the Netherlands as abroad (Jonkman, 2013). My problem statement is addressing the several problems of global climate change. It is needed to research and propose new Delta Interventions too face and adapt to these global changes. There is a need for another Architectural design approach, facing other problems, with this graduation project I wish to further develop and improve the existing climate- resilient strategies within the scale of housing and water safety conditions and criteria for living below sea level in delta areas, which are described here as “Delta Worlds”.

Goal of final project

The goal of this project is researching and assessing the transferability of climate- resilient solutions, strategies and measures within the Dutch Delta and in the Vietnam Delta and translate these data and inventories into my final Urban and Architectural design.

As I mentioned before addressing the several problems of global climate change are needed.

My wish and task are further development and improvement of the existing climate- resilient strategies within the scale of housing and water safety conditions.

The search for innovative instruments, contributed by both different approaches in order to give living in the delta world another meaning of spatial quality. Different worlds have developed different approaches and attitudes towards climate- resilient strategies. The Vietnamese are used to living with the water instead of fighting against the water as the Dutch (Nillesen et al, 2009).

This different interpretations of water, related to historical and cultural backgrounds and demographical circumstances need deeper understanding and relation with Architecture, Urban and spatial design. Addressing and clarifying the problems and climate resilient solutions for the situation in the Netherlands and Vietnam will gain knowledge of different climate- resilient approaches, which gains new possibilities and new approaches.

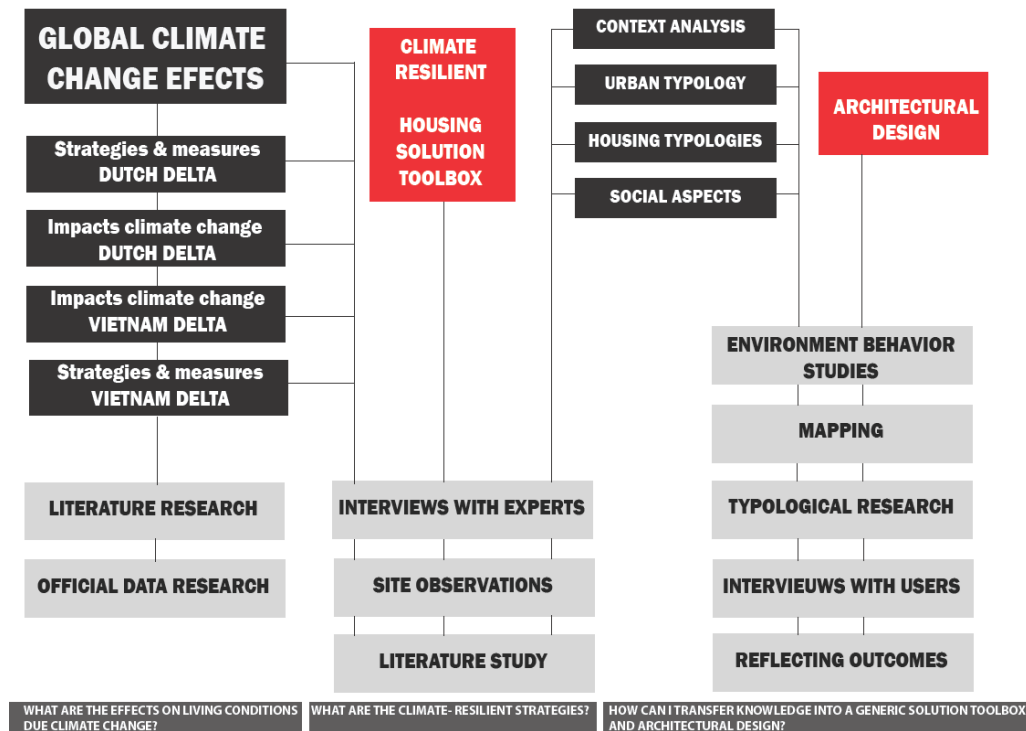
In order to address solutions for the several and interconnected problems mentioned here, which are defined in previous chapter, here I will describe my two main goals in this graduation project:

First aim is the development of the generic and global applicable Climate- Resilient Housing Solution Toolbox, with all the strategies, measures and new inventions in the scale of housing within the Dutch Delta and the Vietnam Delta; Second aim is using this resilient solution toolbox for my final of Climate- Resilient Housing Design Project and at the same time strengthening the improvement of the solution toolbox as well as the final design.

Design method

Next page is the diagram of methodology tools, which are used to provide answers on each research question. Starting the first phase, with the literature research, followed up by the interviews with experts, site observations and additive literature study and finalizes with environment behavior studies, mapping, typological research, interviews with users reflecting the outcomes. The different forms of input and output, which will sharpen as well the Toolbox and the Design are listened in this methodology diagram.

The combination of as well Normative approach: “What should be” and the Substantive: “What if”, “Why” will lead to interesting answers to this case. Urban design is Normative trained to imagine and execute schemes for the future. Research is usually associated substantive information and with understanding specific phenomena (Lang 1987, Moudon 1988).



Reflection

The development of new strategies and measures, by questioning and researching the transferability between the two Delta Worlds are very challenging but also promising. The need for a catalogue with all possible climate- resilient housing solutions are a product of need in the near future, since the effects of global climate change will become more and more visible and yet such a large catalogue does not exist. There many new steps, which need to be taken leading towards the goals, still when I reached my final goal I want to extend this solution toolbox with more Delta areas around the world in order to collect and publish as much knowledge about climate- resilient housing for all Architects around the globe. The biggest challenge in collecting the data is the question how to make this data generic in order for assessment in the Climate- resilient Housing Solution Toolbox, thus all the different knowledge existing plans and design need to be translated into one language and categorized in different typologies.

Time planning

Here my working plan from the start of my graduation last February 2013 until the final presentation is described. This diagram describes the start of the graduation, where research within the theoretical framework and the urban and architectural analysis are taking most time consuming in this first phase. In this phase one is working from research to design. Current phase I'm passing by is the P2, which means I'm at the border of research to design and yet aiming to head vice versa, namely from design to research and then again from research to design. Thus the findings, variations, Solution Toolbox and Final Design can strengthen up each other's quality and will be the decision-making tools for improvement. Thus in this period the focus is more on design and less for analysis and research. However new designs, raise new questions, thus the step from design to research is also needed in this phase.

The first period is called, P1- P2 (till June 2013) and will focus on the research question, What are the effects on living conditions due climate change in the Dutch Delta and the Vietnam Delta?

The second period is called P2- P3 (till September 2013) and will focus on the research question, What are the climate- resilient strategies concerning housing in the Dutch Delta and the Vietnam Delta?

The period heading to the final is called P3- P5 (approximately November 2013) and will focus on the research question, How can I transfer the knowledge for climate- resilient strategies for safe living to a global applicable strategic solution toolbox and Architectural Design?

Reference list

Books

I. Bobbink et. al., "Water in Sight", An exploration into landscape architectonic transformations of polder water, TU Delft (2010)

A.L.Nillesen, J. Singelenberg, "Amphibious Housing in the Netherlands", Architecture and Urbanism on the Water, NAI Uitgevers, Rotterdam (2011)

Seneca, V. Hunnink, "Seneca:de lengte van het leven", athenaeum- Polak & van Gennep, Amsterdam (2013)

Lang, J. (1987)

Moudon, A. V.(1988)

Reports

Intergovernmental Panel on Climate Change (IPCC) *haar derde rapportage: Climate Change 2001* (IPCC, 2001).

Journal

Wageningen World , Magazine of Wageningen UR and KLV about contributing to the quality of life, nr.d, Deltas learn from eachother, rising sea levels page, Delta regions all over the world are particularly vulnerable to the effects of climate change. Led by Alterra, part of Wageningen UR, a new knowledge network called the Delta Alliance is working on finding solutions to this. The key seems to lie in being less fearful of the water, Rene Didde, page 11-13, (2010)

Lecture

S.N. Jonkman, theme "Kentering in de waterbouwkunde", Het water weet de weg, TU Delft, 23th of May (2013)