

BETHLEHEM

- *from exploitation to ecosystem service* -
the cultivation of a regenerative building language

*'revitalizing a former sugercane plantation into a public
production park that stimulates a transition towards a
sustainable domestic (self)building culture'*

reflection paper



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Studio:

Architectural Engineering
No. 22

Part of:

Master of Architecture, Urbanism and
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0 | Introduction and motivation

Originally I started the MSc Building Technology. After two semesters of Building Technology and one semester abroad in Norway, I decided to change to the MSc Architecture; Architectural Engineering. My interpretation of Architectural Engineering is that it considers the social position of the architect to be an overarching principle. I felt like I was missing this in my previous education. In the studio one also critically reflects on the position of the architect. At Architectural Engineering, you often start with defining the relevance of the work you plan to do, before you do that work. To me it is very important that I am given the time to think about the relevance of my work in connection to societal issues, and to formulate my position as architect in relation to the project.

From the desire to contribute to the mitigation of societal issues I chose to graduate on Sint Maarten, initially for the apparent demand for resilience in the built environment. The need for appropriate solutions there seemed high, especially since the strength and duration of the reoccurring hurricanes will increase due to climate change in the coming decades. My focus has always been on helping the lower social classes of Sint Maarten, to which my graduation project is dedicated.

1 | Research and design, design and research

The methodical line of inquiry of the studio can be defined by extensive research, followed by design (figure 1, appendix). In the MSc3, the focus is mainly on both thematic and overall research. At the end of the MSc3, you have to present a concept-design. I experienced that in the extensivity of the research, the design can become of minor importance, while it is very good to already think of a design in an early stage. Nevertheless I have followed the methodical line of inquiry of Architectural Engineering.

I have conducted a clear thematic research, presented in a scientific paper, with the title; 'the vernacular as example' which described how traditional vernacular architectural principles can improve the building culture of Sint Maarten. Writing the paper, I discovered four sustainable vernacular principles; *material appropriateness*, *climate responsiveness*, *socio-economic advantages* and *adaptability*, of which I researched cases. The thematic research helped me enormously in defining a problem statement and an objective. It made me realize that the problems on Sint Maarten are more deeply rooted than just having to deal with hurricanes and earthquakes. I have never encountered such a complex historical and ethnographical situation as on Sint Maarten. I discovered that the building culture became dependent on import of skills and materials since 1631, when the Dutch occupied the island and brought their own bricks and masons to build with. I also discovered that the architecture of the then indigenous of the island was highly specialized in relation to the environment and embodied socio-economic advantages, but the colonists interpreted the architecture as inexpedient and insubstantial. Furthermore, remnants of the salt- and plantation history of the island are strongly visible in the ethnography; former slaves have settled on Sint Maarten, and though slavery was abolished in 1863 they still seem to have to deal with their history of suppression. Lately, local migration resulted in a mixture of various ethnographic groups on the island, who meet but do not mix.

During the fieldtrip I gained a good understanding of the local reality. What has especially formed the thesis project is the days spend together with the Red Cross, where I gained some insight in the living conditions and needs of the more vulnerable residents on Sint Maarten, and in a way confirmed the theoretical problem statement that I was defining in my thematic paper. The Red Cross days also gave me contacts that I could visit personally, and so I have conducted formal and informal interviews with residents, builders and a restaurant owner/farmer.

Furthermore, next to the thematic research, my overall research is manifold (figure 2, figure 3, appendix). Generally, I enjoy doing research. The extensivity of the research can result in good arguments for design decisions, but I've also experienced that when the field of information increases, it becomes harder to connect the right ingredients to the right design. At some point the amount of information becomes confusing, rather than concluding.

2 - Design process

Motivated by the core sustainability aspects of traditional vernacular architecture that defined the objective of my design; *'how can an urban-architectural intervention stimulate a transition towards a more sustainable domestic (self)building culture?'* I initially came up with the idea to start a bamboo plantation on a former sugar plantation. The products that the production environment would produce could then be used for upgrading the surrounding slums. I took the timber network from Yoshiharu Tsukamoto & Momoyo Kaijima of atelier Bow Wow as main example. However, after a while I felt like I was too much focussed on production and logistics related aspects, thereby creating a new monoculture of bamboo instead of the previous sugarcane on the plantation. Also I was overseeing the multiplicity and variety of the people the intervention could relate to. I was quite confused for some time on how to integrate all aspects that I was researching and desiring. Mo Smit helped by steering me towards the sugarcane production ruins that are present on the plot, therewith showing aspects of the public production park on a smaller scale, and making it more comprehensible in this way.

In the end I have incorporated socio-economic and environmental sustainability in the Bethlehem park. The public park connects to both tourists and surrounding communities. A path connects the different clusters of program, and can grow in a similar way as a rhizome (root system of poaceae) grows. Material appropriateness is acquired by cultivating building materials, that acts as a carbon sink. Climate responsiveness is acquired by showcasing how the architecture in this location can be climate responsive. Socio-economic advantages are realized by incorporating cultivating and building education in the program, the main building that I have designed is a school where local workers and residents can learn how to build with the materials that are cultivated and harvested in the park. All in all it is a social network inside a heritage framework, that stimulates a transition towards a more sustainable domestic (self)building culture, and adds value to the surrounding neighbourhoods. What was once a place of exploitation, is now a place of ecosystem service, providing public space, education, social bonds, materials and economic diversification for the surrounding areas.

3 - Relevance

In relation to the themes of Architectural Engineering; make, flow and stock, I feel like I am mostly related to the make. The thesis project showcases a communal and low tech way of building, build from natural materials in a climate responsive way. I have found a resilient strategy to deal with the hurricanes, based on the idea of sacrificiality that I understood from the pre-Columbus architecture. I perceive this as a highly valuable solution, since the lower (or lowest) social classes often do not have the financial means to build in a completely resistant way.

Globally, having lost a local building language that is adequate in terms of material use and climate response and having socio-economic advantages, is a problem that many countries that dealt with colonialism (and later modernism in the advent of the industrial revolution) encounter. This makes the results of the graduation perfectly transferable in the scientific field, though one will have to take into account the genius loci of the location of the intended design. In relation to the current climate crisis, interventions similar to bethlehem can stimulate a transition towards a more sustainable building culture in terms of material use, climate response and socio-economic networks. I believe a lot of ground is to be gained here, especially in the developing countries that often perceive modernism as an ideal to strive towards, while overseeing the potential of their (ancestors) local and often specialized building cultures.

4 - Looking ahead

In a way, I perceive the process of graduation as distilling. It takes time, and you have to go through several steps for the story, concept and design to become pure and coherent. I think I still have some steps to make therein, and really have to work on the presentability of this project. Rather than following the products stated in the graduation manual, I want to discover what products I need to produce to communicate this specific design. Furthermore, currently, I have a concept and a design from the urban to the detail scale, but I find it still a bit fragile and think the quality of it can be improved. Finally, since I love to make models, I would like to make a model similar to the model of the timber network, that illustrates the processes and social activities related to the design.

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Figure 1

Methodical line of inquiry AE; Msc3 = focus on research and less on design (thematic research as an island within all the research), Msc4 = focus on design and less on research. There is always a relation between the two.

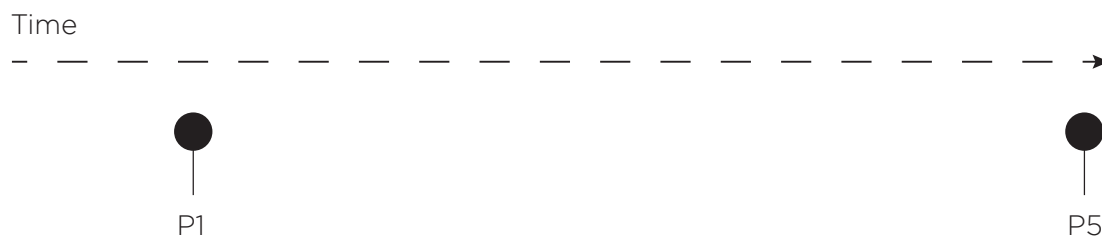
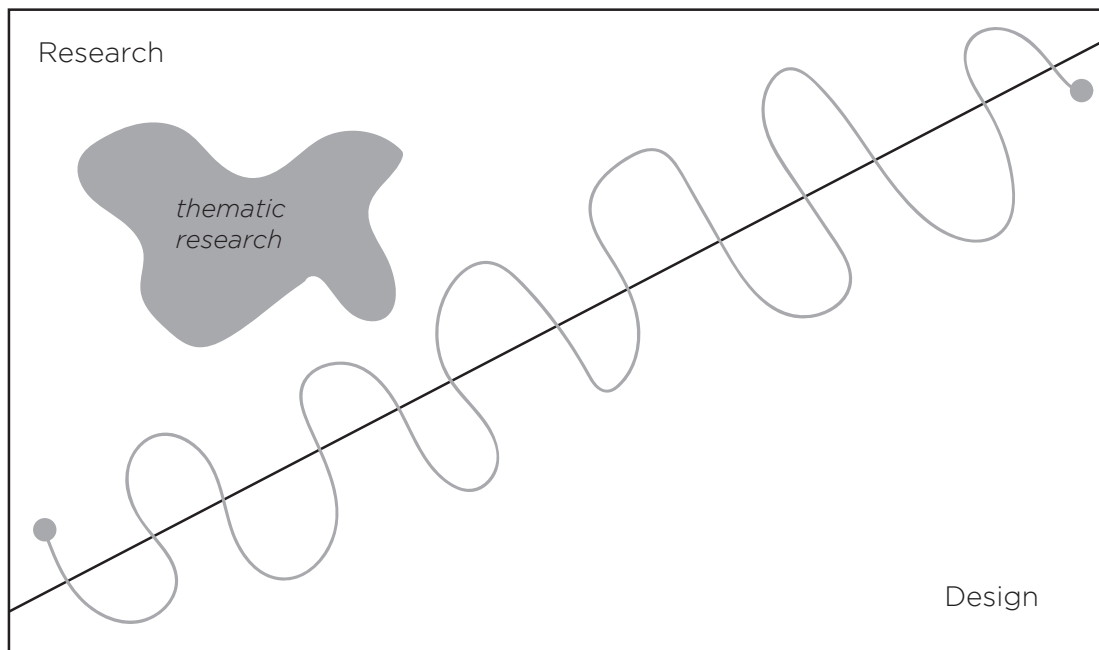


Figure 2

Initial methodology to arrive at the context, program and technique of the design

OBJECTIVE

Next to enhancing general communal, environmental and economic resilience, this project aims to facilitate a transition towards a more sustainable domestic (self)building culture on a neighbourhood scale, by incorporating an urban and architectural design that improves and disseminates adequate building knowledge and skills, based on sustainable vernacular principles, with a critical attitude towards what traditional vernacular principles could mean for Sint Maarten's domestic (self)building culture today (i.e. in close relation to the current economical, social and political situation).

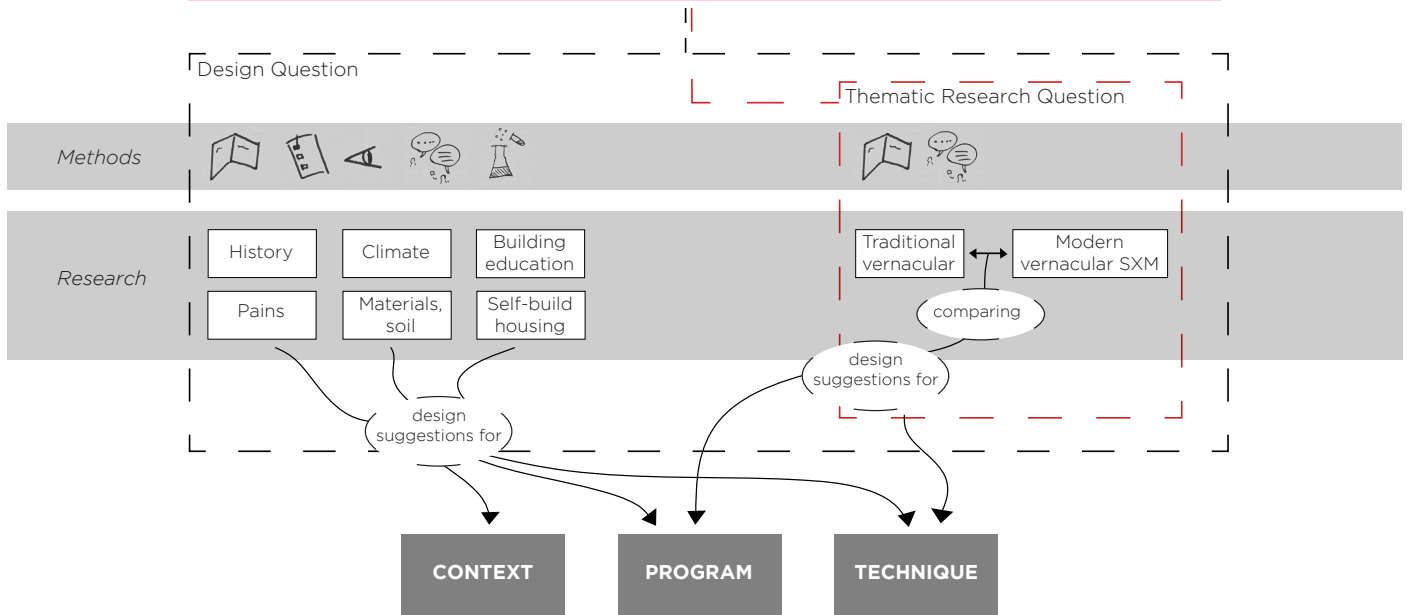


Figure 3

The layers of the research in retrospect. From design question to design. Filled in which research aspects influenced program, context, technique respectively. Read from bottom to top.

