

Draft paper DSRM

TITLE: Communal appreciation of waste in the process of building.

I INTRODUCTION (ca. 500 words)

Reflection on research-methodological awareness

What is the relationship between architectural design and research? This is a much-discussed topic in architectural practice and for me it's evident that design doesn't equal research. However, there is a strong connection between the two. "Although both design and research are activities that are typically initiated for a contextually situated purpose, the specific impetus for each is slightly different. In the case of design, the impetus is commonly referred to as a "problem" [...] that prompts the development of a designed artifact as a solution that can be achieved in the future. In research, the impetus is typically framed in terms of a "question" to be answered at least in part by examining current or past evidence ((Groat & Wang, 2013).” In my opinion, good architectural design is highly contextual. Therefore, it needs research into the context to be contextual. Also, design is a more intuitive act than researching. Research tends to be more systematic and structured where design is more of a chaotic process, where only parts of that systemic structure are picked to enforce or defend the architectural choices.

Thesis topic

My graduation revolves around the reconstruction activity on Sint Maarten after hurricane Irma September 6th 2017, using an urban metabolism approach. This integrates a material flow analysis in the design process. A Material Flow Analysis (MFA) is a method to describe, investigate, and evaluate the metabolism of anthropogenic and geogenic systems (Brunner & Rechberger, 2016). Shortly, mapping (potential) flows of matter and goods a MFA is commonly used in architecture to find opportunities for reuse of materials and improve resource efficiency.

Essential to my research is creating a systemic overview of the flows of material on the island and understanding the material culture behind those flows. The aim is finding opportunities for architectural interventions that can transform Sint Maarten's linear economy to a more circular one by decreasing in and outflows of materials and reuse material flows locally. The project also aims increase communal resilience towards reconstruction after hurricanes by increasing communal material awareness. To aid in finding solutions for this topic this paper revolves around the question: How can a MFA be linked to the communal appreciation of the materials on Sint Maarten?

Reflection on Design practice

Worldwide and in the Netherlands the interest to circular economy and the critical system thinking behind it in architectural design and research is growing (Jackson, 2001). Many source note the importance of improving the metabolism of urban environments (Jongert, Nelson, & Korevaar, 2015;The Ellen MacArthur Foundation, n.d.). On Sint Maarten, the topic is very much underlid however. There is a only a few small green initiatives that aim to change the material use and awareness on the island (Green SXM, n.d.;).

During the course in not only became clear that a sound research methodology consists of multiple research methods, but it also made me see that only doing quantitative research (making an MFA) doesn't provide enough input for a design. Also, qualitative research is needed to understand the meaning of the place and the drivers of its community. Lastly the paper forced me to structure my research more and be clear on my goals and research process.

Reflection on Heuristics:

In the context of Sint Maarten, the majority of building and design knowledge is transferred informally in practice. Building knowledge is passed on vocally and there is little to no structured knowledge on how

to build in a more hurricane proof manner. There is hardly any designer involved in the design and building process of most neighborhoods. Schön describes designing as a conversation with the materials of a situation. It is a reflective conversation with the situation (Schon & DeSanctis, 1986). Conveying the design to untrained builders illiterate builders that act as designers is a challenge for a designer that requires a very specific participatory approach and very clear engaging representations of the intended design.

II RESEARCH-METHODOLOGICAL DISCUSSION (ca. 500 words)

For such a small island Sint Maarten is quite complex context. To the most of the local community is organized informally. To this part of the community material and building knowledge is not commonly available. Along with a colonial history, a large amount of ethnicities and a politically unstable climate the context has many layers of complexity. To understand the dynamics of the island a designer on Sint Maarten needs a broad set of knowledge and research methods. The aim for the research is to systematically conduct the research, translating contextual (societal, material) problems to physical form with an aim on interventions to rebuild their community in a more sustainable way.

Research methods

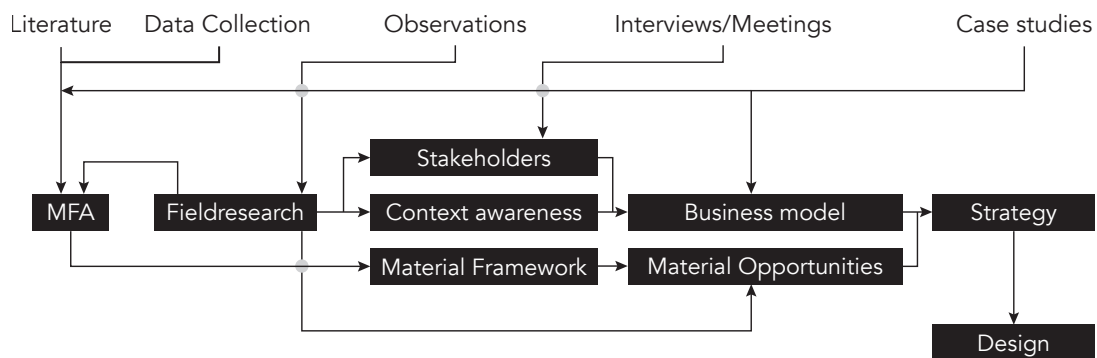


Figure 1: Diagram of methodology

How do you research with a bottom-up, community based approach? The approach for the research consists of a few elements. In chronologic order:

1. First a generate a theoretical framework to test interventions in. Conduct literature research and set up a system overview and its flows of material and money, through a material flow analysis (MFA) and Sankey diagrams (Jongert et al., 2015). MFA: to get a clear quantitative understanding of how Sint Maarten works as a system and how it functions as a framework to test programmatic interventions in.
2. Quantitative research: Collect specific quantitative information to generate a broader framework of background information to understand other building related topics like climate, ethnography, stakeholders.
3. Fieldtrip: ethnographic research, interviews and observations. Planning, acting, observing, and reflecting in a systematic and documented study. Include a sense of place/social system, community behavior, structures, economic structures to integrate a design that makes sense within its context.

Mirroring the approaches to Lucas (Lucas, 2016) the research is clearly context driven. As the island and its community sets boundaries for design input. In the force field of qualitative and quantitative research a fit intervention here needs both a systematic analysis (quantitative) research and a deeper

understanding of communal values which can only be attained by qualitative research like interviews with local stakeholders and inhabitants, observations and other interactions with (the people in) this context. It's also clear that part of the research and especially the research on the fieldtrip has ethnographic elements since the project revolves around an unknown context that I have to get to know. It is about understanding the way of living by living in the same way for a couple of weeks.

As a research tool the MFA's is mainly meant for intervention or provocation within system thinking. Critical systems thinking has set out a variety of methodologies that can be used to promote successful intervention in complex societal problem situations (Jackson, 2001). It's clear also that this part of the research is emic as the perspective of the local people is needed to be able to understand what interventions might work for them. The researcher needs to understand the context from within in order to come up with a just motivation for a design.

Motivation

The choice for an MFA felt logical since the problem arriving from natural disasters is in the first place a material one. And an MFA is a good tool to get a quick overview of the problem and it can be used to theoretically evaluate programmatic interventions, material choices and business opportunities. As quite little data is at hand on Sint Maarten, to me it felt quite logical to start with creating a systematic overview of the context to get a grip on the islands problems on different scales. Also, it was evident that most of Sint Maartens problems arrive from a linear economy. The MFA is a good tool to inventorize and define opportunities for circular interventions.

To deal with the tension between material problems and societal problems, more qualitative research methods were also needed (Brunner & Rechberger, 2016). Here the notion of the material culture and all its aspects are very important. Interventions that introduce change in the system will only work if they is supported by the community. Taking a bottom up approach is therefor essential to integrate the opportunities from a MFA successfully into a community.

Literature review

As for a communal appreciation of constructing with local materials two firms are discussed in the next paragraph. Rural studio takes an interesting position as Mockbee presents architecture as a discipline rooted in community and its environmental, social, political, and esthetic issues (Dean, n.d.)." The designers have an exceptional role in the design process as they participate also in the building process together with the owner. Designs are built especially for one owner, with local materials. "The best way to make real architecture is by letting a building evolve out of the culture and place (Dean, n.d.)." The architect in this perspective is becoming the civilian and designing from his perspective.

Another angle is the research that Studio Rotor does which looks into the potential of reuse of building parts by taking them apart and exhibiting them in a different context to inspire new types of use by the general public. Also they look more broadly into ways of documenting and finding the potential for reuse of building components (Sanz & Breddels, 2017).

III RESEARCH-METHODOLOGICAL REFLECTION (ca. 750 words)

Apart from a few small-scale green initiatives (Green SXM, Waste2Work), circular economy thinking is very uncommon on the island. Very little research is done by the government into improving the resource efficiency on the island so my personal research depends on data collection and making graphical representations of that data.

The community of Sint Maarten is quite closed and diversified with over 100 ethnicities. So fieldwork with NGO's that know the community well and conducting interviews with stakeholders were very important to understand how the community builds and how they use materials.

MFA's history

The ancient Greeks already used the rule of conservation in mass balance calculations. This is the principle upon which an MFA builds. However, the research field of material flows have emerged only from the 20th century. The first author to use the term metabolism of cities was Abel Wolmans in 1965. The first studies in the fields of resource conservation and environmental management appeared in the 1970s. After this the MFA became a widespread tool in many fields, including process control, waste and wastewater treatment, agricultural nutrient management, water-quality management, resource conservation and recovery, product design, life cycle assessment (LCA), and others (Sanz & Breddels, 2017).

Case studies

MFA's in architectural practice and on island scales are widely used. As islands have clear boundaries and are thus interesting objects of study. Metabolic for instance did a complete MFA on Vlieland (Circular, 2017), but also in different cities in the Netherlands. Here islands can act as innovative examples to boost solutions in a circular economy in other contexts. But also, more research is done on management tools for the material flows in the urban environment. Think of the madaster, design for deconstruction, products as a service, building passports and so on. Those tools operate however on a big scale and don't provide research into architectural quality. There are architecture firms that manage to combine material reuse research and architecture. Superuse studios, BedZED, various urban farming projects, lots of community based projects around the world of which Rural studio is the best example (Thomas, 2006).

A strong connection between qualitative research methods described in the previous chapter with an MFA could provide insights in architecture that are until now lacking. Relationship between systematic thinking and bottom up perspective is underlit when it comes to the researched sources on island resiliency. Revaluation of second hand materials is happening on a product scale and big scale, but little on the scale of buildings. That's where the methods I use can be of value.

IV POSITIONING (ca. 750 words)

Material and community

My position within the material culture is one that tries to bring material and communal values together. The architecture of developed regions has a long tradition in adding material value culturally. Materials have passed their value of just providing basic needs for people. This rich material history towards the community becomes clear in the position Scheurs (2018) takes as she talks about status, expression, experience and aesthetics within architecture. The public has a different more distant relation to material here. There is very little space for these architectural layers in a poor community however. A student within the rural studio project stated: "Poor people do not need architecture, but they need money and a builder". Also, Mockbee's deep social consciousness led him to see the need for the architect to design not just for the community but within the community, and thus over time, seek to change the status quo and allow for a better future (Wilson, 2012). This made me realize that the role of material and therefore the role of the architect in poor communities is fundamentally different than within rich communities. The role of an architect within this context is there for one that uses the materials to provide the basic needs of people in the first place. An architect in that sense facilitates the basic conditions to build a stronger community.

Community based architecture

Although not specifically addressed that way in architectural research, post hurricane situations are very similar to post-war situations. And architectural solutions for reconstruction have often been approached with standardized mass-produced methods. Observations and interviews with local stakeholders showed that standardized solutions don't bring lasting quality to the community. A lot of social housing

projects in Sint Maarten struggle with the maintenance of post hurricane developed neighborhoods, as they were poorly constructed without the input of the local community and an understanding of the local climate. An architect should thus play a fundamentally different role in the design process. Avermaete takes an important stand on this (Avermaete, 2010) by stating the architect should move away from standard solutions and become a facilitator to support of self-build and self-managed building processes and neighborhoods. He shows that neighborhoods designed with local groups work better because people are experts on their own situations and are given "freedom" to shape their own environment. Making the design process participatory allows for more appropriate architecture that is context and community driven. The role of the architect is then essentially again to design with the community and not for it. I only became aware of this by actually engaging in conversations with home owners and documenting their interests through pictures and interviews.

During the research, my position developed in a similar manner. Integrating an MFA into the design process allowed me to understand the wider context and act more effectively in the local context. In addition to a MFA however, a wide variety of research tools and communication tools are needed to convey the conclusions.

It became clear to me that a lot can be learnt from the way of doing of the local community. Reuse of materials in the poorest communities is part of the survival of the people. The reuse of building materials happens not because it derives from a cultural environmental consciousness. It derives from necessity. A designer in this context should be aware of this value. Introducing new building methods and different materials is possible, but it will take a lot of convincing and gaining trust in the community. It requires also a different way of communicating. The people that build can't read architectural drawings and most of them can't read at all. The challenge for a designer then is also to present work in a more visual engaging way and interact intensively with the end user, to the extent of building together, to show one to one how to build.

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