Kampung Circularity

Reflection Paper - Building material reuse and upcycling strategy Bandung, Indonesia

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01 Introduction

I initially entered the Architectural Engineering studio with a fascination of modular building systems which had sparked my interest and my fascination for detailing which was one of main reasons I chose this studio.

However the opportunity to broaden my horizon combined with my history of living in the tropics was even more appealing and I decided to join the Shared Heritage Studio. The context demanded a more low-tech approach and a quickly became fascinated by the big waste problems apparent in Indonesia.

The site visit was very important to further develop my fascination. It revealed that many building materials were stored or became waste within the kampung.

Interviews gave insight in the functioning of the current dwellings and observations revealed multiple potentials within the area. By letting myself getting engulfed by the culture and the people my goal got defined to create safer affordable dwellings out of waste building materials.

The essence of this goal tries to tackle a bigger societal problem. The current use of building materials follows a linear approach from product to waste. This system can not be sustained in the future. This project strives to create a circular approach within the kampung context.
02 The relationship between research and design

The research formed an important basis of my design. To be able to find reuse recycle and upcycle opportunities for building materials the available materials of the context had to be defined.

This information was collected from literature studies and by use of observations an estimation could be made of the total building material flows of the specific design area. It was a struggle to get to this point.

During the initial stages of the research I tried to take a very broad approach from embodied energy of materials to the production of upcycled materials. Narrowing down the goal and the questions of the research really helped me with my research and consequently with my design.

The research lead to many important revelations considering the waste materials that were targeted, materialisation of the design and an overall strategy that defined how these materials are applied.

The continuous design process itself consists out of numerous little researches. From figuring out how bamboo connections are made or how water can be collected and purified in the roof design. The relationship between research and design is a continuous one. Sometimes more elaborate sometimes very specific.

03 The relationship between the theme of the graduation lab and the subject chosen by the student

There is a strong relation between the subject of my graduation and the graduation studio. The subject concerning reuse and upcycling of materials perfectly fits one of the main aspects of the graduation studio: Flow. Which concerns the flow of many different aspects like water, energy, waste and also materials.

The other main aspect of the studio called “make”. Was more applicable in the design process where I had to come up with practical systems and solutions to implement the building materials waste streams in my design.
During my design process I come up with many solutions which initially I find effective and good. I hold on to those solutions too much instead of looking further for other solutions.

By communicating I realise that there are problems with my solutions and it forces me to find and experiment with different solutions.

One of the main things I learned during my design process was that I sometimes follow too broad of an approach and need to narrow it down more quickly. I try to involve too many aspects at the same time. This was especially difficult during the early stages of my design project.

After finding the main focus of the project I realised that I could still incorporate most aspects that I tried to realise before. But this time it came more natural as it was on the back of my mind and did not result in forced solutions.

In the end the scientific relevance of this project is not only the material flow data found within the study. The building serves as a showcase of how to upcycle building materials, what processes are necessary to create the building products and how materials can be easily assembled and disassembled within the building.

04 Research method and approach

The methodology of the research mainly consisted out of a literature study, interviews and observations of the site.

The approach of the studio consisted out of two parts the first half of the graduation was focused on research and the second half of the graduation was mainly concerning design.

Starting with the research created a useful base of knowledge that was applicable till the very last stages of the design. Personally I would prefer research and design come together at an earlier stage especially because they are not exclusive towards each other.

During the secondary stage of the graduation I was still busy finding information and researching systems, methods and materials.

The main advantage of the research for me was to be able to focus on one particular aspect. In my case on Building material reuse, recycling and upcycling and not get distracted by other aspects of the design. This helped me build one main story instead of multiple different stories which would have lead to a weaker design.

The feedback I got during my graduation process was effective. I was very fortunate to join the shared heritage studio to have a great amount of people to reflect on my ideas in order to improve them.

Every tutor brings a different perspective and body of knowledge to the table which was crucial to end up with a wholesome design.
05 The relationship between project and the wider social context

My project relates to societal problems on different scales. On the large scale it is about how we can tackle the problem of material scarcity and sustainability to be able provide for future generations.

How a small circular economy can be created within the kampung. Emphasizing that the small social scale of the kampung can be potentially a good way to start a circular economy hence the big scale makes everything too complex.

On the small scale the project is about creating a safer and better living environment while also providing a way of additional value in the form of income to be created.

06 Ethical issues and dilemmas encountered

Ethical issues and dilemmas were especially important to try to avoid in this context. As an outsider at feels really wrong to try to force the design on the people in the kampung.

Especially with the colonial history of the Netherlands which was not always very kind to the Indonesian population.

Numerous examples showcase that this is not a good way of practice and that such projects have a hard time to take root in the community.

The goal for my project was always to start from a bottom up approach. This is why I involve local people to build and manage the project. Additionally the positioning of the building is in consultation with the local authority/community.

A different type of ethical decision that I had to make was the use of timber as structural material. Initially I used teak but after researching about the ethical implications of deforestation in Indonesia I changed it to use bamboo as a more ethical and sustainable material.
Research Methodology

DESIGN

Shou Architects
BIMA Microlibrary

Site study research

Site research

Analysis of current building materials

Case study research

Precious plastic

Stonecycling

Building material flows of Bandung

Comparaison

Analysis strategy

Embodied energy of building materials

Literature study

Analysis potentials in context

Site research

Analysis of building materials

BIMA Microlibrary

Analysis output flow of building materials