

**Reflection**

# **Factory for Good**

**written by**

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## **0. A brief introduction**

Shortly after I entered the Cigondewah studio of Architectural Engineering, I became interested in the cycles and usage of water and energy in the area. The peri-urban industrial area can be separated into two parts: an enormous textile factory (about a third of the size of TU Delft campus), and the surrounding informal, high density villages called "Kampungs", where migrant factory workers and local inhabitants live. I was interested in including the textile factory in my research, because I saw that the factory had the potential and capital to provide new sources of water and energy to the area, allowing the factory to bring not only economic prosperity, but environmental and social prosperity as well.

My research question was therefore: "Can a decentralized, circular system be used to provide energy and water to an industrial peri-urban neighborhood of 26,000 people in Bandung, Indonesia?" The outcome of the semester of research was a realistic calculation of the total water and energy use of the area, and calculations of the amount of water and energy that could be provided from alternative sources, such as rainwater and biogas from human waste.

## **1. Relationship between research and design**

Based on the results of the research, a new water and energy system was proposed, which involved adding new water and energy related infrastructural facilities to the area. The proposed system has been directly implemented in the current design, but at a significantly smaller scale - decreasing the service coverage of the services from 26000 to 1000 people. This is because the research only focused on calculations - cubic meters of water and kilowatt hours of energy - and not so much on how this water and energy is used or collected by the user. It is, for example, not practical to design a single public toilet that serves 26000 people, because nobody would be willing to walk for 10 minutes just to go for a pee.

So, instead of being one big building, with one big system that serves 26000 people; the project has transformed into many small buildings, each with its own small system, each serving around 500 people. The development of a new water and energy system in Cigondewah is therefore incremental - the small scale systems can increase or decrease in number according to the changing needs of the local area, as well as how much money is available to invest in infrastructural projects.

## **2. Relationship between the theme of the graduation lab and the subject chosen by the student**

My graduation project is closely related to the existing themes of the graduation lab of Home at Work, Cigondewah. Home at Work tries to solve problems within this area, brought about by the introduction of the textile industry. The migration of factory workers into the area led to rapid densification of the existing villages, creating low quality housing and a lack of infrastructure for the new population. The factory itself contributes to environmental pollution of its surroundings, dumping toxic waste into the rivers and significantly lowering the water table, making it difficult for locals to access clean water from wells.

Looking at the previous projects of this graduation lab, the main story of Cigondewah seems to be that the factory is the major source of the problems in the area. While this is true, I also believe that, since the factory has the capability of creating negative changes in the area, it may also have the capital to create positive changes as well. Instead of seeing the factory as a villain, I see potential for the factory to become a force for good, for the factory to collaborate with local people to create a better neighborhood, not just economically but also environmentally and socially.

### **3. Relationship between the methodical line of approach of the graduation lab and the method chosen by the student**

The methodical approach of this graduation lab is:

1. research the site context and write an 8-page scientific paper based on this research
2. design an architectural intervention based on this scientific paper

Writing a scientific paper as a research method was useful because this allowed me to investigate the site as objectively as possible, and the scientific method gave me the attitude of investigating something regardless of what the outcome might be. So, instead of asking **how** a decentralized circular system can be implemented in the area, I asked whether a such as system even **can** be implemented in the first place. This meant that I was open to the possibility that we **cannot** implement such a system. This 'scientific' attitude to research led to a realistic answer for my research question, based on numerical data - yes, we can implement such a system, but the positive impact of such an implementation is quite small, much smaller than I expected. I think the scientific method is a good antidote to the many utopian and unrealistic graduation projects that architecture students are often accused of creating.

However, a scientific paper is also incredibly specific, and aims to solve one precise problem, instead of looking at the problem holistically, which is what architects do. As a result from the scientific research, I knew exactly how many kilowatthours of energy can be produced by the poop of 26000 people, but my calculations did not consider how far people are willing to walk if they wanted to poop, or how that poop can be collected and transported to a centralized facility for energy production. I struggled to fit my specific, numerical research results in a holistic architectural project, and this resulted in the significant decrease in scope for the system I mentioned in part 1.

### **4. Relationship between the project and the wider social context**

Industrial peri-urban contexts are a global phenomenon. We are human - we all want and need products, and those things have to be made somewhere. Our needs for these products will only increase as the global population grows. Currently we are pushing factories further and further away, to poorer and poorer countries - from the Netherlands to China to Indonesia to Bangladesh. This can't go on forever, eventually even the poorest countries will demand better treatment. What would be the next step then? Stop wanting/needing products? Localize production and bring industry back close to where it is consumed? Or take advantage of industry and let it aid development poor areas? My project proposes the latter. I chose the topic not because I think it's the best solution (I don't think anyone knows what the best solution is), but because it's the least explored, at least within the field of architecture.

I'm also interested in humanitarian architecture. Before coming to Delft, I worked for three architectural offices, all with a similar business model: funded by NGOs, affiliated to a university, and designing buildings in poor/developing areas, with aim of improvement of the local neighborhood with the creation of new buildings (usually in the form of schools and community centers). This made me question two things:

1. Is building libraries, schools, community centers, and hospitals what the local people really need? If a village has a limited amount of capital, should they spend it on buying more books, or building a new library? On training better teachers, or building a new school? On hiring more

- skilled doctors, or building a new hospital? How can an architect, a designer of physical things, justify their work in a developing context? Is there even a role for the architect in these places?
2. Is working with NGOs the best way for architects to help develop a poor neighborhood? Is there an alternative?

My graduation project has been my first attempt in answering the two questions above. My current answers are:

1. Yes, it is possible for architects to have a role in developing contexts. One potential role (among many others) is to design infrastructure - buildings that provide water and energy, as water and energy are physical things that can be manipulated by physical interventions like architecture.
2. Yes, there is an alternative to working with NGOs. Factories are a huge source of capital, and they are already responsible for bringing economical prosperity to many developing areas. Now, with the increasing environmental and social awareness of private companies, it's not difficult to imagine factories bringing social and environmental prosperity to the areas in which they are situated.