



# Advisory report

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# Abstract

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Previous two months, two Human Technology students departed to Manila to work on a river rehabilitation project regarding to the polluted Pateros River. Many people live in the Riverbank of the Pateros river, and are therefore considered as 'urban poor' (also known as the informal settlers) because it is forbidden to live within a range of three meters from the riverbank. The people discharge their waste in the river, without being aware of the consequences of their actions. Based on the field research, the informal settlers are not involved into the society, and are therefore living a separated life. They lack a proper functioning waste management system and in addition; ordinance, whereby from urban poor perspective, there is no other option than discharging their waste in the river. It has been shown that there is a need for three important elements which will create a fundament for a more healthy and dynamic environment and better water quality. Those three elements are Awareness, Facilities and empowerment. These elements are complementary towards each other and have to be combined together in order to be lucrative. Based on these elements, three concepts have been formed to meet the urban poor in the riverbank. Regarding to Awareness, it is important that the people are well informed concerning causes of pollution and also segregation. Regarding to facilities, it is important that the urban poor dispose of a proper functioning waste management system, which is low cost and what is supported and maintained together with the LGU's. Finally, to empower the people, it needs to be emphasised that the people are able to make a difference as an individual; that the small things are already effective and that they can mean something on the long term.

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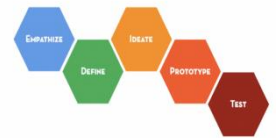
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## INTRODUCTION

As Human Technology students the aim is to define the user needs of the future target group. We are Lisa van Loon and Fenna den Hartog, both Human Technology students at the Hanze university of applied science in Groningen, the Netherlands.

The Human Technology discipline focuses on the involvement of users during research, innovation and development.. This involves physical products (devices) but also websites, applications or extra curricular services. To manage the process, we use design thinking. Design thinking is a specific method which suits problem-based innovation.



Metro Manila, Capital of the Philippines, is a metropolitan in South-East Asia. The dynamic city, which does not sleep, offers a huge amount of diversity and contrast. Like many cities in south-east Asia, the city struggles with natural disasters and political disturbance. Manila Metro shows also a high extent of urbanization. The results of these phenomena are tend to be visible in the daily life of Metro Manila. The concepts 'pollution' and 'poverty' are very suitable when you read and hear about Manila.

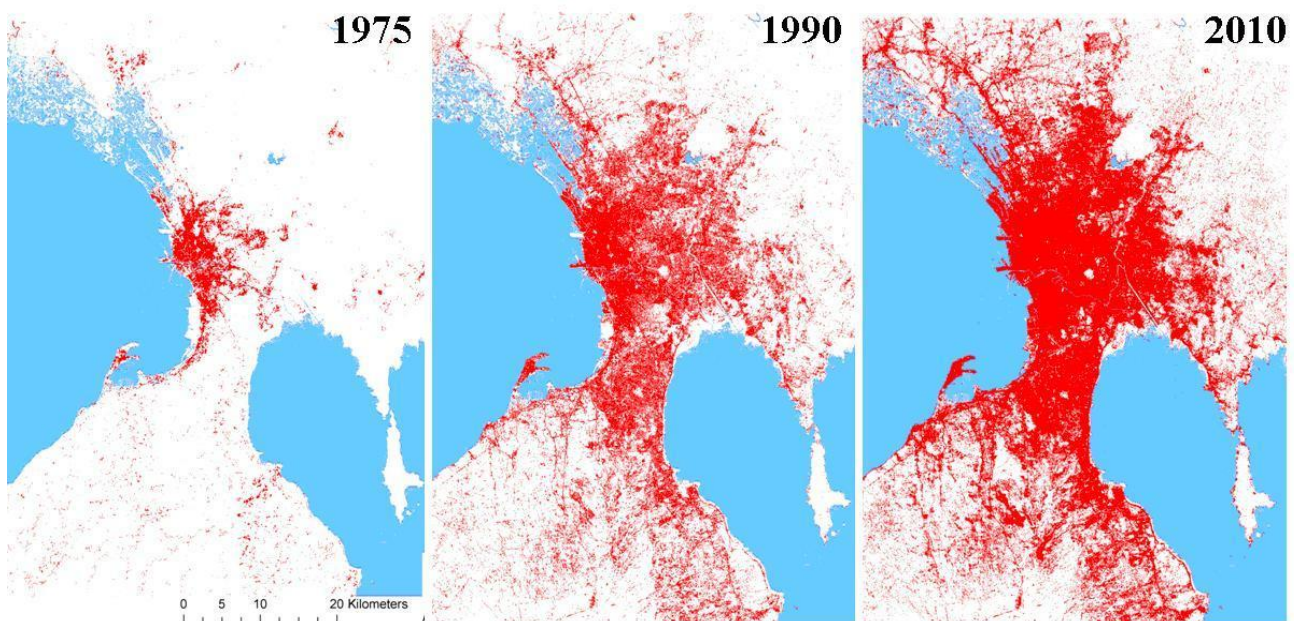


Image 1 Growing population in Manila. Source: Lotte de Jong Bachelor Thesis

Poverty and pollution are correlated concepts. The focus will be put on the Pateros Area. The Pateros Area consist of 70.000 inhabitants which are registered people. It is a fact that there are a lot more people living in pateros but mainly these people are the squatters/ informal settlers. Squatting would not be a big problem as it is today if these people would life in normal houses and participated well in the area they live in, but these people build small instable cabins really close to each other so no normal garbage truck can pass these roads. People get rid of their waste by burning it themselves or by dumping the waste into the river. These illigal inhabitants can't get rid of their waste, what makes it logical behaviourism to discharge it into the river. The government doesn't come with strict measures against this problem.

The main goal during this research is to meet the local people near the Pateros river concerning waste management. The problem in this situation is the pollution of the river, as a result of not involving certain groups of people into society.

We want to work to a solution (or service) what triggers behavioural change in a way that people are not forced anymore to discharge their waste in the river. This will lead to a cleaner river which makes it possible for the nature itself to gain a better water quality over the years. The most important aspect is that the local people are involved in the best possible way during the process to this solution.

## RESEARCH

As mentioned earlier, the design thinking method has been used in order to create structure and direction during the research. The empathize and define phase are used to create an overview of the situation. What is really going on there? What is the actual problem and what is the cause? Several methods have been used to find the actual problem and the underlying needs. The next phase, the create phase, has been used for brainstorm sessions and to come up with concepts which suit the problem regarding the Pateros river.

The phases which will be emphasized here are the Empathize and the Define phase. These phases have been crucial for the fundament of our research.

The methods we have used during our research and the most important outcomes will be explained in the scheme below:

Method	Value creation	Important outcomes
<b>Observing</b>	A Human Technology approach is focused to approach situations with an open mind. Trying to progress the things you see in a different way than people use to do. It is focused to put data in a certain kind of context, based on cultural and social-psychological knowledge without making assumptions	Based on the conducted observations a very important outcome is that the people are happy and that there is no need to pity them. The people find their ways, and the most important thing for them is to be together with their family
<b>Interviewing</b>	The same applies for interviewing. The people who have been interviewed are from different layers, different disciplines and all together they contributed to an accurate overview of the situation. They shared a common vision regarding waste management and important environmental	Effort is being put in waste management, for example segregation. Several attempts have been done to motivate the people to participate in waste management and to practice waste segregation. In the first place, the locals seemed enthusiastic and were willing to participate. After a while, the enthusiasm decreased and the waste became un-segregated again. Also, a not involved party in this case were the informal settlers. No attempts have been done to involve the people near the riverbank.
<b>‘Write your thoughts in the magic box’</b>	<p>During the research a big box was placed where people were able to answer questions anonymously.</p> <ul style="list-style-type: none"><li>- What is your dream vision of waste management in the future?</li><li>- What can make Pateros look more beautiful and how can we enhance the living environment?</li><li>- Who should be responsible for the following types of waste? 1. Household waste. 2. Street litter. 3. Dumpsite waste. 4. Recyclable/non-recyclable waste</li></ul> <p>The amount of answers and enthusiasm showed that people were caring about the environment and were willing to cooperate. This is considered as an eye-opener that people were aware of the consequences of certain human behaviour.</p>	Important outcomes on this method are that people are aware of the environmental impact of waste and littering. Many people answered that they want to see a clean river again, but they simply don't know how and they considered it beyond their powers.

<b>Emerging with locals</b>	<p>To show up at places (riverbanks, 'slum' area's) where 'tourists' never show up and to show that you care about the people and listen to them, people are more likely to trust you and to speak their thoughts.</p>	<p>When arriving at in the riverbank, the first thing the people said was 'we don't want to go! We don't want to go! Don't relocate us!'. The people thought that it was an initiative from the government to send people and prepare them for relocation. At the first place they were afraid, and emphasized that they were already living there for over 50 years. When it became clear for them that it wasn't a governmental initiative but an initiative for help, they started talking about that they are content with the living circumstances. But one perticular thing that they were missing was light, because there is no electricity. The mayor of Pateros also promised them ' legal' houses, so that they can stay in their habitat and don't have to be relocated to the provinces. Will this ever become reality?</p>
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It is important to mention that not all the informal not be relocated within now and 10-20 years. Therefore, Manila should find a way to deal with the situation as it is right now. That means that the informal settlers should be involved right now, instead of waiting for them to be relocated. The urbanisation does not stop, so it's not considered realistic to think that all the illegal settlers will be recognized for social housing. Additionally, the people are often inclined to return to the city. There is a higher chance of employment, and they consider it as their 'home'. People living near the riverbank emphasized that they were already living there for more than 50 years, and that they were really afraid to be relocated. To conclude, waiting for the urban poor to be relocated and to rely on that is not a suitable attitude for this situation.

## SOLUTIONS

In order to meet the people near the riverbank are not involved in a waste management system. There is a waste management system in Pateros, which collects garbage twice a week at a certain collection point. This is not approachable for the urban poor because the collection points are hard to reach. Therefore, the people are not able to participate in waste management. To make it easier and approachable for the people to participate in waste management, the people need three elements. **Awareness, facilities and empowerment.** These elements are complementary towards each other and will therefore form a fundament for success. It is important to mention that one element does not work without the other element.

**The facilities do not work without empowerment and awareness.** Therefore, real time feedback is needed to stimulate the people in a positive way and in order to make this solution sustain. To **empower** the people, they have to see with their own eyes that the change of their behavior has impact on the situation. In this case, that the water quality gets actually better and that the improvements are physically visible. On this part, the final idea is to place waterlilies, running on solar power. The color on the waterlilies is representative to the actual state of the water. When the water quality is really bad, the color of the lilies is red. When the quality of the water gets better, the waterlilies will turn green. The people of the community notified that they actually miss lights. Therefore, this would be a good idea to also fill the need to enlight the environment with floating waterlilies.

The people need to be **aware** of the consequences of their behavior. According the interviews and observations, the people know that plastic pollutes the river. What they for example don't know, is that waste water from the laundry, what gets discharged in the river as well, also harms the water quality. The people should be aware of all the aspects what can harm the water quality.

Awareness needs different approaches, like education and also real time feedback. A cheap and collective way to do this is to give the people cards where is explained how to segregate waste, and what exactly is the cause of a polluted river. People need to know that not only solid waste has negative effects on the water quality, but also human feces and waste water from the laundry.

### Waste Identifying Sheet

The Following **SOULD NOT BE** in the  
Pateros River



- Human Waste
- Detergents
- Kitchen Waste
- Industrial Products



Image 2 Waste ID sheet made by Stijn Nouwens (Pressure Cooker)



To meet the people in terms of facilities, a zip line above the ground can make it easier for the people to transport their waste to a collection point. The people can collect their waste with separate small containers where they can practice segregation. Every container can be locked on the zip and when stuffed, the container can be clicked on the zip and 'transported' through the small alleys to a central point on the street. The only thing people have to do is to make sure the container gets from A to B. When arrived at B, the waste can get picked up by a waste truck.



*Image 3 Picture taken by Kim Hersbach: Slum area built on a wall, which was ironically enough meant to prevent people living near the river*



At the images below, you can see the made mock up, what is representative to a slum area. It visualizes the situation regarding to building within three meters from the river, based on the previous picture





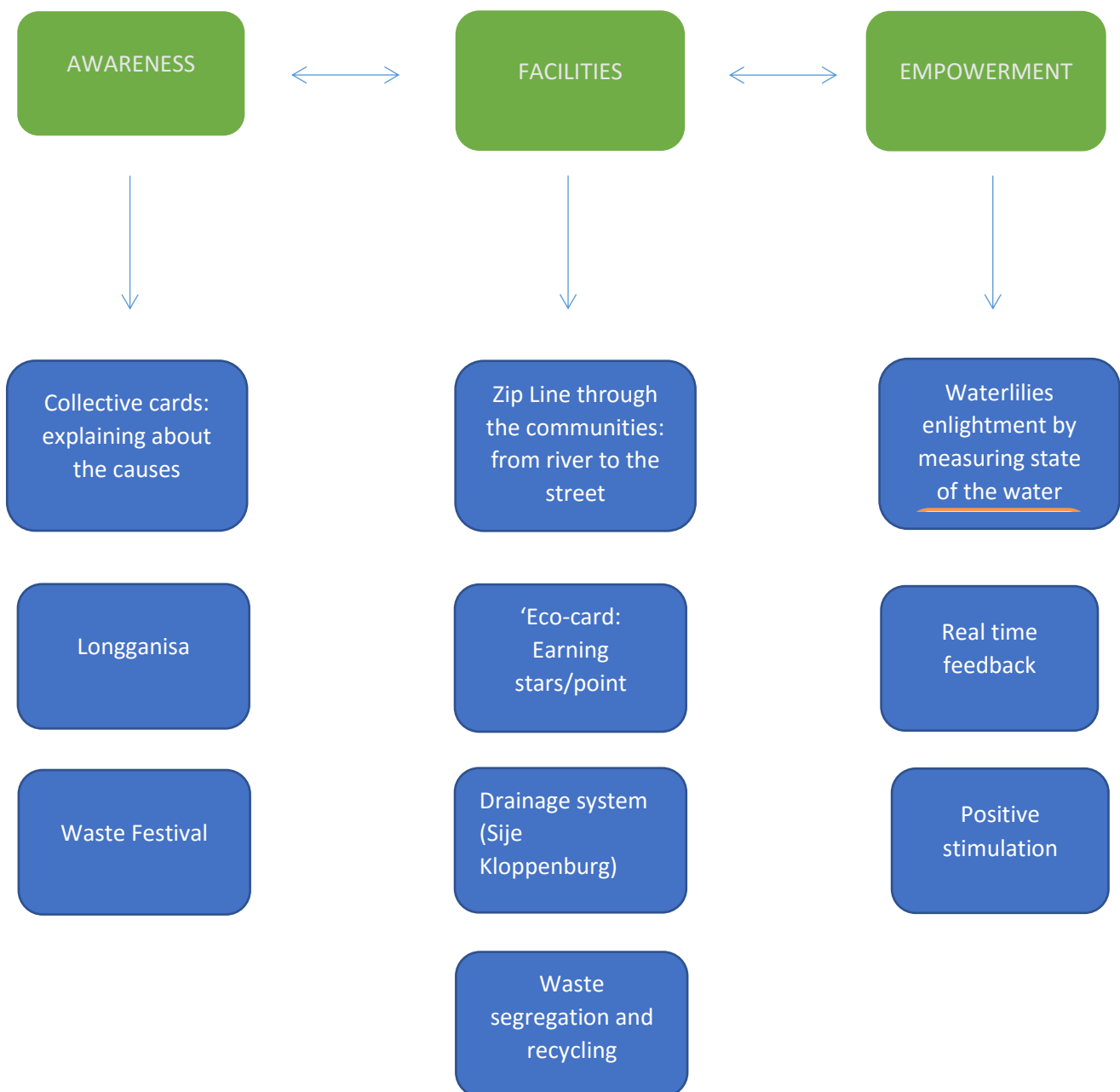
All the elements are implemented in the mock up. On the picture right in the middle, you can see the artificial waterlilies, which function as empowerment, a reminder for the people that it is up to them to make a difference and that they actually can. It also functions as a light source, powered by for example



Image 4 Visualization of the waterlillie, made by Lisa van Loon

solar panels (picture above). On the photo in the lower corner on the left, you can see the cable line system which is sited through the community. People can hang their (segregated) garbage easily and follow the cable line to a collection point (left picture in the middle). At this collection point, a trash can is located underneath the ground. People get rewarded every time they bring their waste their waste to this collection point, in terms of a star. When collected 10 stars, people can redeem it for groceries. With a system like this, a small economy can arise, because waste gets valuable in this case (Abalos, 2016).

In the scheme below, the drainage system and a waste festival is mentioned as well. The drainage system is a final outcome of Sije Kloppenburg, based on the harming factor of human feces (mentioned in research report). Sije Kloppenburg, a civil engineer, discovered that human feces are harming the water quality in a high extent (Kloppenburg, 2016). Therefore, he came up with a low profile drainage system, what catches the human feces on a certain surface. Therefore, the human fec (Jong, 2016)es do not end up in the river. The waste festival is an additional aspect regarding to awareness. Based on the gathered data (research report) there can be concluded that dancing and singing is an essential element in the Filipino culture. To make people extra aware and to present certain progress what the municipality is making in order to keep the community motivated, an annual waste festival can be organized, to emphasize the importance of a clean and waste free environment.



## CONCLUSION

It is important to mention that not all the informal not be relocated within now and 10-20 years. Therefore, Manila should find a way to deal with the situation as it is right now. That means that the informal settlers should be involved right now, instead of waiting for them to be relocated. The urbanisation does not stop, so it's not considered realistic to think that all the illegal settlers will be recognized for social housing.

Additionally, the people are often inclined to return to the city. There is a higher chance of employment, and they consider the city as their 'home'. People living near the riverbank emphasized that they were already living there for more than 50 years, and that they were really afraid to be relocated. To conclude, waiting for the urban poor to be relocated and to rely on that is not a suitable attitude for this situation.

In the scheme on the previous page, you can see the three elements presented and also which solution belongs to which element. Other solutions from previous researches (the Longganisa, the Drainage system from Sije Kloppenburg) are mentioned in the scheme. The Longganisa (Jong, 2016) is in this case a contributing factor, but with a different approach. The Longganisa helps reducing the amount of waste in the river right now, at this moment. Additionally, the Collective cards, the zip line and the water lilies are a part of the 'how might we prevent' approach, a behavior change approach whereas the Longganisa is a practical approach. It helps reduce the damage which already has been done, due to certain human behavior: discharging waste into the river.

It is of high importance that all the different approaches are combined to fulfill the final goal; a cleaner Pateros river. Therefore, combining different approaches together is the most valuable to do, because these different approaches are based on different perspectives and therefore various disciplines.

To prevent the current problem to escalate a preventive approach is essential. However, the problem is already going on so therefore a real time approach, what reduces the problem right now, is of high importance as well.

**The community approach (preventive)** to involve the urban poor in practicing waste management and to make them aware, and lastly, to emphasize that they can make a difference as an individual. That behavioral change will always be lucrative.

**The Longganisa approach (real time)** to collect the flowing visible waste in the river. This is a solution what can reduce the amount of waste in the river at this moment, real time.

**The 'drainage approach' (preventive)** to prevent the human feces (non-visible) to end up in the river. The effects of the human feces play a dominant role regarding to the water quality.

Since 'Flood Free Manila' is a 10-year project, it is recommended to conduct further research on the communities, and focus on the involvement of this particular group. Let's get rid of the 'us' vs 'them' approach, and focus on the 'we together' approach.



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