

Multi-Disciplinary Challenge

Mahiga River

Group 2: Mahiga thrives



Berna Bekdemir, (0963326)
Kimberly Kramers (0971065)
James Kyhle Saul, (18103588)
Kyla Jin Malaque, (18105411)
Pierre Kendrick Gosiaco, (18100881)

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Problem description

The local government has made several attempts to clean up the river, such as a clean-up campaign in which some 50 tons of waste was cleared. Unfortunately, it does not help because the problem of the river has still not been solved to this day. The Mahiga Creek is one of the many small rivers that flow through Cebu City and Mandaue City. These small flows often have no clear origin and usually **flow from** a higher point to a lower point. The river originates at two points and **converges** in a larger river that ends in the Mactan **Channel**.

Like many rivers in Filipino cities, they are heavily polluted. Due to strong and often uncontrolled urbanization, homes / businesses or homes / businesses are often unintentionally or thoughtlessly built at right angles to the water flow. As a result, they act as a discharge for human and artificial waste. The waste can be very harmful to the local ecosystem and through products such as detergent or heavy metals. Many rivers are therefore "dead" and there is no oxygen left in the water to sustain life. Another consequence of the uncontrolled or heavy urbanization is that household or industrial waste often ends up in the river. This can happen accidentally due to a shortage of good waste places, or on purpose because residents are often unaware of the consequences of pollution. It can be concluded here that socio-economic factors play a role. Residents are not concerned with recycling or properly disposing of waste because they first have to survive (financially) or residents think that someone else will solve it (socially). Whichever of the 2 it is; aval ends up in the river, and blocks the waterway so that the water can no longer flow properly.

The Philippines is in a tropical climate with a temperature that fluctuates between 20 and 30 degrees. Precipitation can, as in many places in Asia, fall in large quantities from the sky. Cebu City is located at the base of a mountain range, where water can fall and flow during a heavy shower. Due to the aforementioned blockage of the rivers, water does not have a chance to go anywhere so floods can happen quickly. Flooding can spread human, industrial, household and toxic waste in the streets and, as a result, can lead to unhealthy and dangerous conditions. It can be concluded that the problems reinforce each other, creating a vicious circle. Below in the graph it is simplified to see what happened.

Objective

The Mahiga creek has two major problems, and these are the high level of pollution in the water and the flooding that happens when there is heavy rain in a short period of time.

The aim is to give this river a new life by coming with new innovations that can help solve the problem of the pollution and flooding.

Another important role that we are aiming for, is to raise awareness among the residents of how one's action can cause the whole ecosystem and quality of life to fall apart. Therefore, it is important to encourage the residents to work together with the government so that they can improve the quality of life and ecosystem of the river and neighborhood.

The ultimate goal is to present two detailed solutions in two different infographics, that shows where in the river the solution should be applied, how much it cost and who is involved in the realization of this project.

Global question

How can the water quality of the Mahiga river be improved?

Sub-questions:

1. What's the current situation of the Mahiga creek?
 - 1.1 What type of pollution does the Mahiga creek know?
 - 1.2 What caused the pollution?
 - 1.3 Where does the main source of the pollution come from?
 - 1.3 What kind of sewerage facilities are used throughout Metro Cebu?
2. What is the behavior of the residents?
 - 2.1 are they aware of the damages that they are causing because of their actions?
 - 2.2 How can the residents help?
3. What is the role of the government in this project? How much can the government afford?
4. What solution can be applied here in the Mahiga creek to create a better-quality water?
 - 4.1 Is there already a plan to solve these problems?
 - 4.2 Are there references to other projects that can be used for the Mahiga creek?
 - 4.3 What are the easiest and affordable ways to solve this problem?

Research methods

Desk research:

- Primary and secondary literature review
- Spatial analysis
- SWOT-analysis
- Stakeholder analysis
- Reference research

The **desk research** would provide us with information such as the primary and secondary literature review. This type of review can be legal documents, documentaries, books, and interviews. The second analysis that would be done is the spatial analysis, this helps our team to have a bigger picture of the location itself and it would be combined with the SWOT- analysis who gives us a quick overview of how the river works in terms of quality. To get an idea of who is involved in this project our team will make a stakeholder analysis. At last, our team will also do reference research to improve our knowledge on existing solutions that can be an alternative or used in our project.

Stakeholder analysis

To map out the different stakeholders there will be a stakeholder analysis made. Here, the various parties involved with the river will be made transparent. Parties such as the residents, the government and the municipality. This will schematize the positions, the confidence, the interest, the type of interest, the influence, the risk, the measures to be taken and the level of participation.

Final product

Week 1: Our team will make a 4 fact sheets in total about the Mahiga river. Each fact sheet will have a different focus point. Here below are the theme's about every factsheet	
Fact sheet 1: Problem cause	History about the Mahiga River
	Downstream water pollution cause
Fact sheet 2: Participants	Stakeholders
	Responsible
	Resident Behavior Analysis
Fact sheet 3: Sewerage	Current sewerage system
	Past attempts at cleaning the Mahiga River
	Other river treatment methods
	Climate and Seasonal Influences
Fact sheet 4: Future	Solutions
	Future Goals
	Future Designs
Week 2: We will combine the collected data and make two infographic summarizing the problem cause and problem solution.	
Infographics	Infographic 1 (explanation)
	Infographic 2 (explanation)

Schedule Pressure Cooker: River Challenge Cebu City: Mahiga River

Week	Main Topics	Topic	Who	
Week 1 (19-25)				
19 april 2021	Meet eachother and make plans for the upcoming week	Create group name Create concept logo	Everybody Kim	
20 april 2021	Prepare a 2-Page PVA for two weeks	Review the original PvA Make a 7 page P.o.A. to a 2 page P.o.A. Create New Timetable	Everybody Everybody Everybody	
21 april 2021	Webinar (helps with facts sheets)	Obtain Preliminary Data From Webinar Series 1 and Drive Database Begin Data	Everybody	
		Works on fact sheets 1: Problem Caused	History of the Mahiga River Downstream Water Pollution Cause	Kimberly (half a page) Ken (half page)
		Works on fact sheets 2: Participants	Stakeholders	Khyle (half page)
			Responsible Resident Behavior Analysis	Kyla (half page) Berna (half page)
22 april 2021	Speed Date With Experts	Consult in Regards to Preliminary Processed Data and Revise Fact Sheets with Expert Input	Everyone	
23 april 2021	Meetings	8:30 - 10 AM (Dutch time) and 2:30 - 4:00 PM Progress pitch	Everybody Berna (half page)	
	Fact sheets	Work on Fact Sheet 3: Sewerage, Data to be Collected from Drive Database and Studies	Current sewerage system Past attempts at cleaning the Mahiga River Other river treatment methods Climate and Seasonal Influences	Kyla (half page) Khyle (half page) Ken (half page)
		Work on Fact Sheet 4: Future, Information to be Produced By the Team	Solutions	Everybody
			Future Goals Future Designs	Everybody Kimberly (half a page)
24 april 2021	Weekend (individual work)	Work further on Fact Sheet 3 and 4	Everybody (Individual)	
25 april 2021	Weekend (individual work)	Work further on Fact Sheet 3 and 4	Everybody (Individual)	
Week 2 (26 - 30)				
26 april 2021	Speed Date With Experts	9 - 10 AM (Dutch time) and 3 - 4 PM (Filipino time) schedule with Marix and Finalize	Everybody	
	Prepared powerpoint	Schedule a meeting with the LGU's For the Pitch Solution Make powerpoint presentation	Everybody Everybody	
27 april 2021	Infographics	Work on Infographic 1: Problem Cause	Everybody	
28 april 2021	Infographics	Work on Infographic 2: Problem Solution	Everybody	
29 april 2021	Pitch solution to the local government		TBD	
30 april 2021	Upload www.climatescan.nl		Everybody	
	climatescan.org		Everybody	

