RIVER SCAN CHALLENGE
MAHIGA DOWNSTREAM

The Mahiga River is 9.1 kilometers long, having an upstream in the Banilad highlands, a midstream in Subangdako, and a downstream in the Mabolo Reclamation Area.

According to DENR-DAO 34 and Environmental Protection Agency standards, the river is classified as Class C and D, and it was declared biologically dead in 2018.

ISSUES and CHALLENGES

Solid Waste

A minimum of 11.7 tons of plastics are released per year from the Mahiga Creek Estuary based on a study in 2019. The riverine plastic waste monitoring revealed that about 87% of solid wastes per cubic meter in the river bank of the downstream are plastics, and it is classified as polluted using OSPAR form. The river is severly polluted since the total pieces of waste in the 100m riverbank is within 251-500.

Flooding

The risk of flooding is a result of solid wastes, silt, and debris that have accumulated in the river. Barangay Mabolo is identified as a flood-prone area since a portion of Mahiga Creek is located in the barangay. In the year 2022, there have been incidents of flooding in the North Reclamation Area due to heavy rains.

Informal Settlements

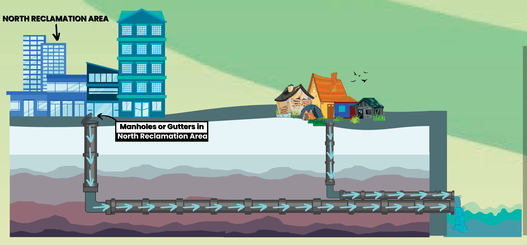
There are informal settlements present downstream of the Mahiga River. The domestic wastewater coming from the illegal settlements is directly discharged to the water body since there is no sewage system, resulting in an increase in the coliforms in the Mahiga River.

Water Quality

Parts of the river are suitable for recreational activities such as boating or similar activities and for agricultural, irrigation, and livestock watering, while the downstream is just a navigable river. The recent urban water quality tests revealed that the river failed the standard limit of 0.5 ppm for phosphate, indicating that the river has high nutrient pollution which negatively impacts aquatic life and ecosystem health.

OUR 3 IN 1 SOLUTION!

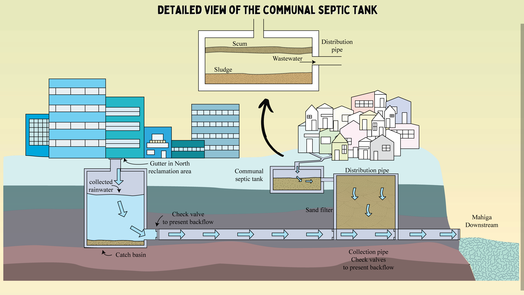
Introducing, 'C2K System' (which stands for Catch Basin, Communal Septic Tanks w/ Filtration, & Kaamguhan Program) a project that tackles all 3 problems simultaneously (Flooding in North Reclamation Area, Water Quality of Mahiga Downstream, and the improvement of the lives of the residents near the river). This plan serves as an improvement of the existing drainage system in the North Reclamation Area and areas near the Hypermarket Area in Mabolo.



CURRENT DRAINAGE/SEWAGE SYSTEM IN THE AREA.

The current drainage system in North Reclamation Area consists of manholes and gutters connected to a system of pipes that are lead to the river. This type of system slows down the rainwater from discharging into the river during high tide (when the height of the river is above the discharge pipe).

Since the domestic and industrial wastes are direction to the downstream portion of Mahiga Creek, the water quality of the said portion of the river is deteriorated and polluted.



PROPOSED SOLUTION

Our proposed solution serves as an improvement of the existing drainage system in the North Reclamation Area and the sewer system of the informal settlement and industrial area.

The main components of the solution include the:
(1) Installment of Catch Basins (per block) below the existing manholes or gutters in the North Reclamation Area to temporarily store more rainwater. This includes check valves within the outflow pipes of the catch basins to prevent backflow from the river.
(2) Installment of Communal Septic Tanks connected from the existing pipes from the toilets, with a natural filtration system (by means of sand and gravel) that will enter the river as filtered water.

ADVANTAGES

- Catch basins are inexpensive and simple to install.
- They are low-maintenance gadgets that require little maintenance once they are installed.
- Catch basins can help avoid floods by collecting runoff from the rain and directing it to the proper drainage system.
- They could also filter impurities from runoff, helping to safeguard the environment.
- A shared septic tank can effectively clean and manage the effluent from several homes.
- They provide small communities with limited resources an affordable answer.
- A communal septic tank may improve the overall cleanliness and health of a community by efficiently handling wastewater.

POSSIBLE DEVELOPMENTS

- Catch basins can be improved such that it can:
  a) regulate domestic waste water
  b) treat chemicals and contaminants
  These developments can further improve the quality of the water that enters the river.
- Regular maintenance and inspection is needed to prevent:
  a) build up debris over time, clog, and result in floods.
  b) foul odors that could contaminate groundwater
  c) issues that could hinder optimal functioning
- Since catch basins do not treat the water they collect, contaminants and chemicals may be discharged into the environment if they are not properly maintained.
- The communal septic tank may be upgraded to be a part of a sewage treatment facility when the area becomes suitable for larger populations or locations with high water demand.

"The future of the river and community is intertwined, saving the river secures the society"

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