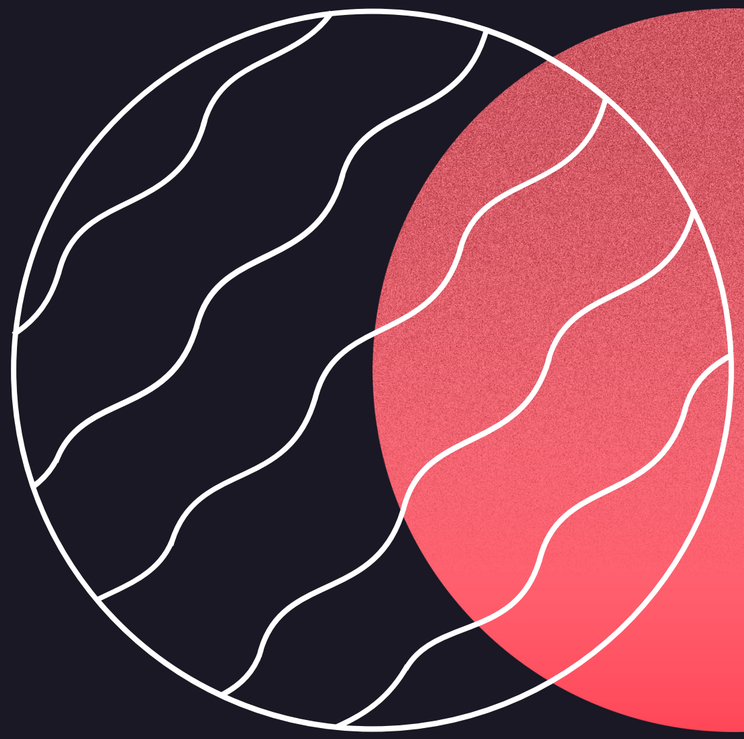
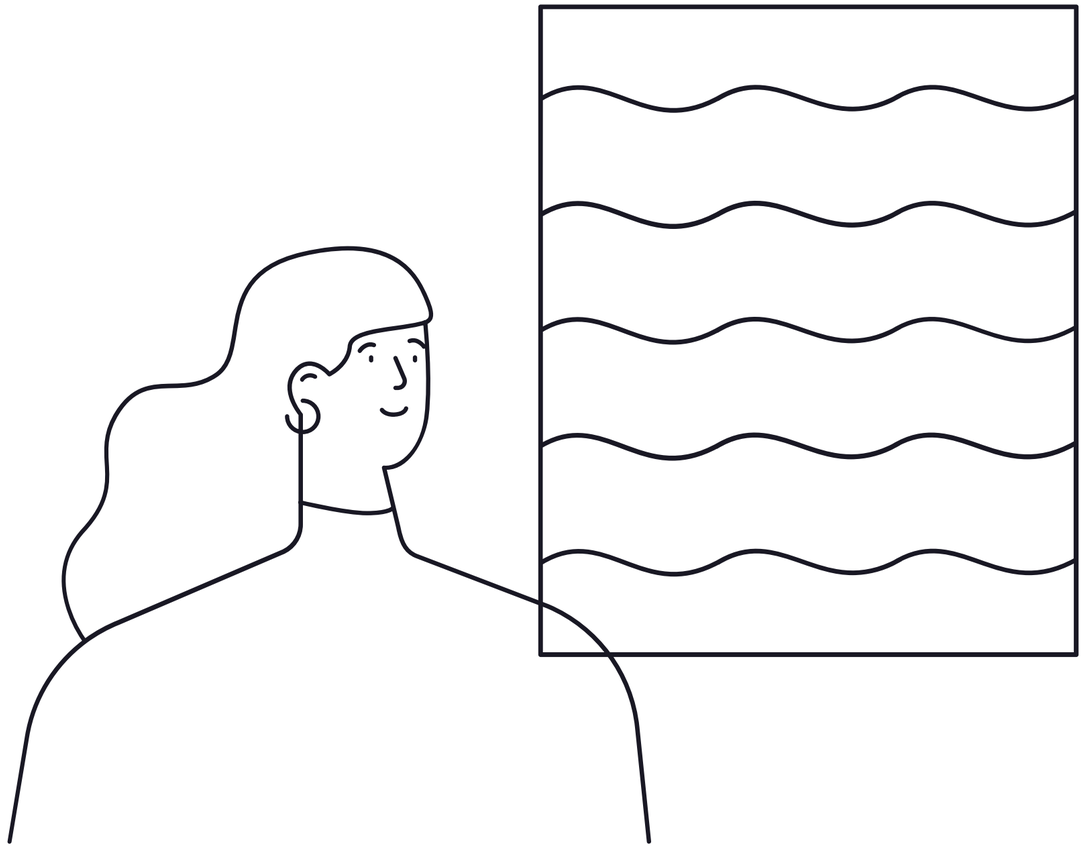
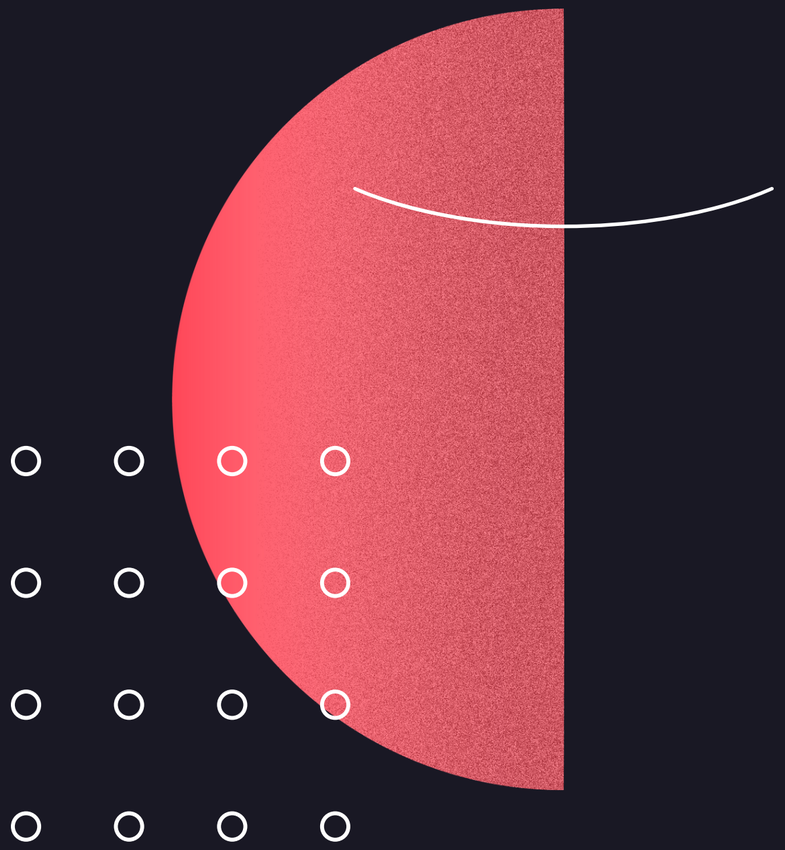


AI for Waste Water Treatment

Team: Seenzoned
NEC ENVIRONMENT HACKATHON

Our idea uses the traditional techniques based on purifying water punched with IoT and AI. The approach we follow will not only be helpful in curbing water pollution, but also provide an efficient monitoring system to work upon the data collected.





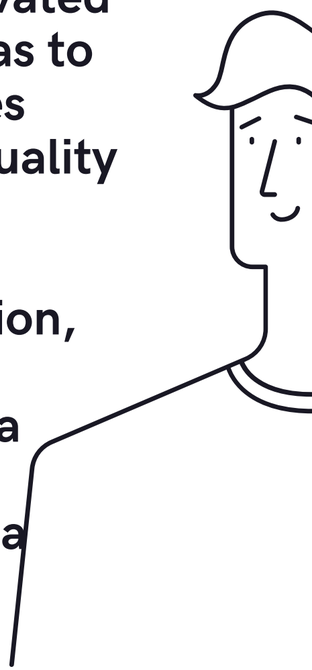
Our Focus

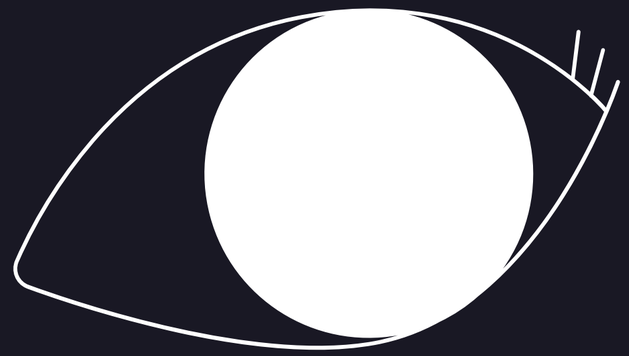
Small Scale Industries

Even though due to various efforts from the government, more and more large scale industries are looking at ways to treat their effluents, the situation is rather difficult to deal for Small industries. Small industries require small activated sludge or UASB systems. On the small scale these plant tend to be made of simple equipment that is not reliable.Thus on the small scale the plants do not work well.

EXISTING SITUATION

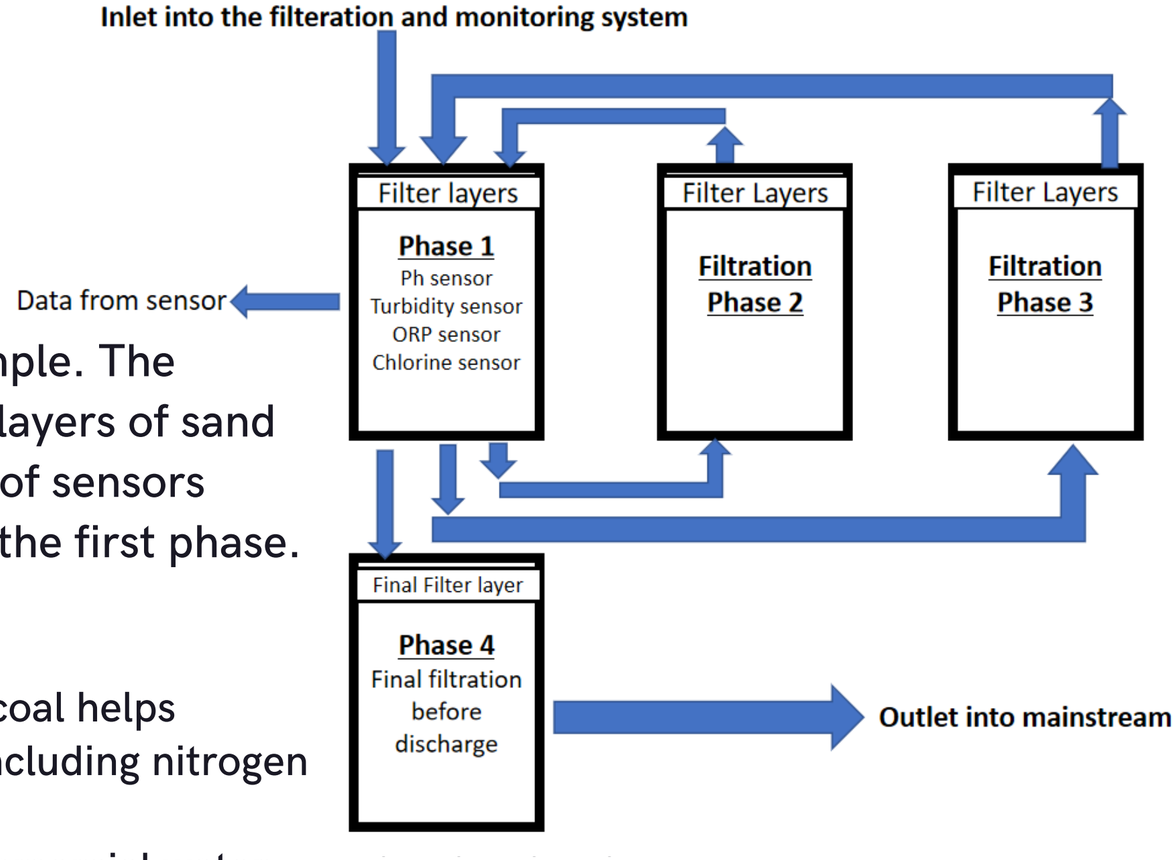
- Small industries require small activated sludge or UASB systems, quality has to be compromised as small industries can't bear the cost of bringing in quality systems.
- It is costly to include instrumentation, such as pH control (sensor and controlled dosing pump), because a large plant requires a system that almost is the same cost as that for a small plant.
- Labour and lab costs for checking the correct operation is almost the same too.
- No enforcing authority acting stringently due to political interference.
- Lack of public awareness about the environmental resources.





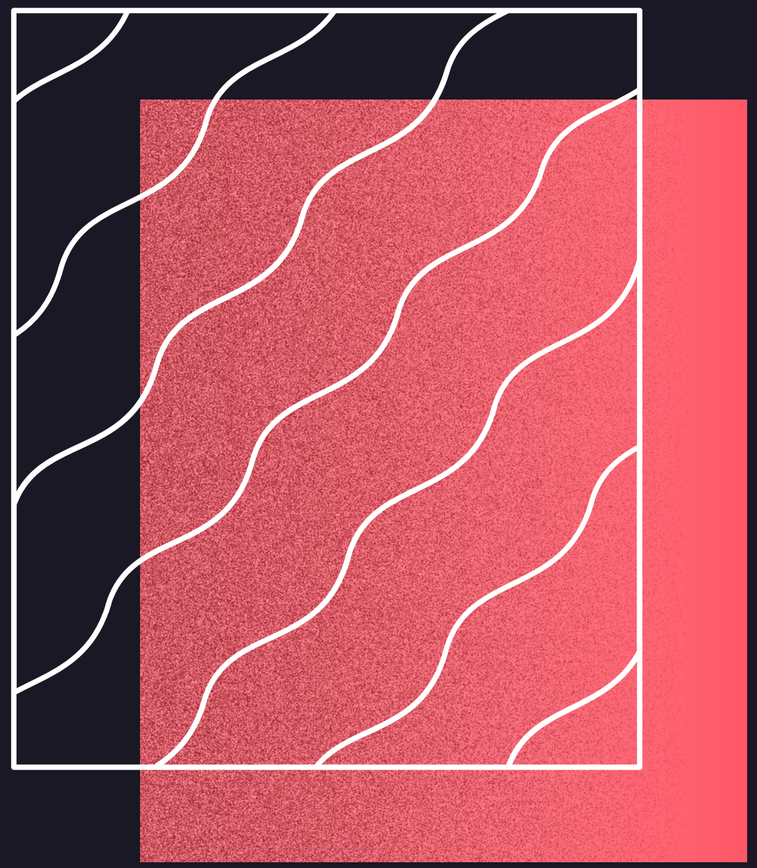
HERE'S WHAT WE CAN DO

THE PRODUCT



The basic principle in which our model will work is really simple. The wastewater from industries or sewage will pass through the layers of sand charcoal and coconut and be stored in a chamber. An array of sensors present there will collect data from the filtration done from the first phase.

Charcoal is a slow, but effective, water filter. The carbon in charcoal helps remove toxins. Charcoal filters out particles down to 1 micron, including nitrogen oxide, lead, and sulfur oxide.
Coconut filters water by absorbing it through layers of fiber. Commercial water filters often use coconut carbon filters to remove toxins and particles. The coconut husks, whether used commercially or in a do-it-yourself filter system, trap most particles, toxins, and parasites, including cryptosporidium and giardia.
Clay mixed with a combustible material like sawdust, rice husks, or coffee husks. When the combined substance is fired in a kiln, the combustible material burns out, leaving a network of fine pores the water can flow through which further purifies the water.



An array of sensors present there will collect data from the filtration done from the first phase.

THE FIRST CHAMBER

- Residual Chlorine Sensor (to be interfaced with Arduino. Not till available)/optional: Chlorine sensors evaluate free chlorine, monochloramine, and total chlorine.
- Turbidity sensor-(Rs 1899)Turbidity sensors gauge suspended solids in water, normally by determining the amount of light that is able to pass through the water.
- REES52 PH sensor Module (Rs- 4200): The pH of a solution, how acidic or basic it is, a major indicator of water quality.
- ORP Sensor: ORP sensors gauge the Oxygen-Reduction Potential of a water sample. Used in conjunction with a pH sensor, an ORP measurement can offer insight into the degree of oxidation/reduction reactions taking place in the solution.

WORKING

Our model will contain layers of sand charcoal and coconut husk depending upon the phase in which the wastewater is in.
An array of sensors present there will collect data from the filtration done from the first phase.

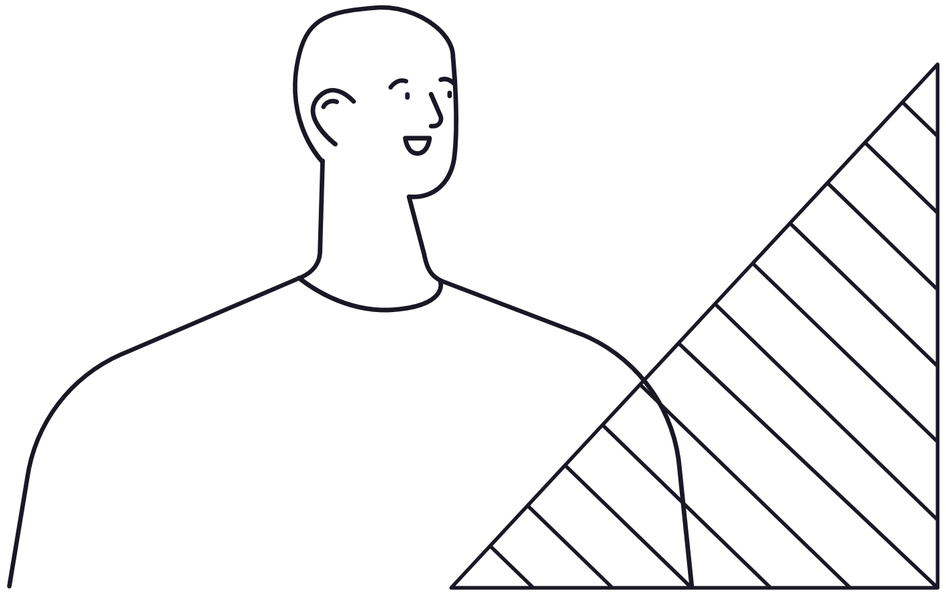
Fro the sewage the wastewater will be collected in a chamber where the sensors present will analyse the data.If the data collected from these sensors are above a threshold level set by us, the water will be cycled through 2 more phases and return to a similar chamber for testing.

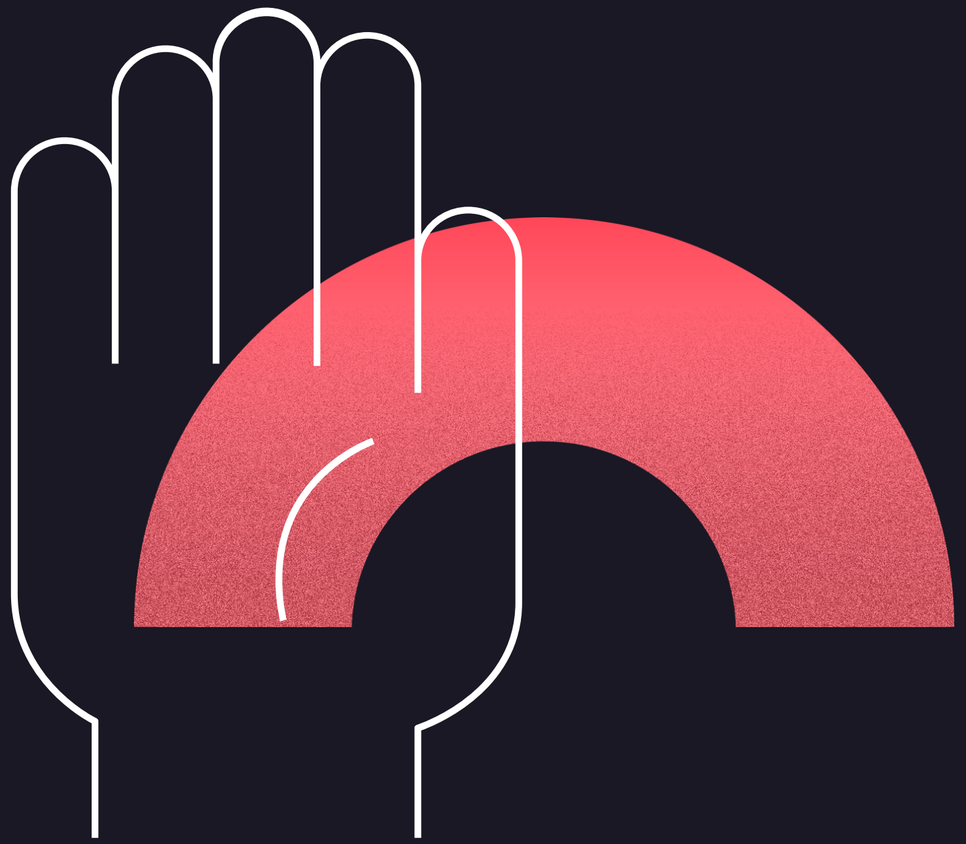
Each time the data will be collected from the sensors and will be uploaded to a database. Now for the final purification, the water after the 3 phases will be collected in a chamber containing a combined substance of sawdust, rice husks, or coffee husks, and then will be released into the mainstream river.

Well, we can teach machines to make our lives better :)

Once we fetch the data from the sensors of the system (pH, turbidity of water, chlorine content conductivity and Oxygen-reduction potential), we can use analyse these data into various useful ways so that we can compare various aspects of water of different areas and find trends of decrement or increment in water quality in different areas. We can use these analysis to even recommend what crops will be good to cultivate in a particular area depending on the various parameters being worked on here. Using advanced machine learning algorithm we can find future trends in water quality we can expect in different water bodies.

NOW WHAT WILL BE DONE WITH THE DATA COLLECTED?





BUSINESS MODEL & THE MARKET

According to a survey done by Trade Council Of India New Delhi, 90 percent of the total wastewater in India continues to be discharged without any treatment. Majority of this is from smaller-scale industries. To make the numbers tangible, approximately 6.2 billion liters of untreated industrial wastewater are generated every day across India.

Setting up a water treatment plant would require a huge capital. The cost-effectiveness of our idea and prototype can seriously help in reducing the pollution caused by these small scale industries, primarily because of the lack of funding.