

# Filtration For The Nation: Sedimentation Filter

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## The Problem

There is a lack of accessible drinking water in the village of Pu Ngaol, Cambodia. Within the village of Pu Ngaol, Cambodia, there are only eight public boreholes that are equipped with handpumps. These handpumps are rarely used for drinking water as they contain mud, hard water, and iron. Additionally, during the wet season, most drinking water comes from rain collection jars, as the river's turbidity is too high. While there are small scale private water treatment plants all around rural Cambodia, Pu Ngaol is left without access to improved sources of drinking water for most of the year.

## Our Approach

Our approach was to first consider the level of technology that is common within Pu Ngaol and work within those existing limitations, using local resources as much as possible. We also wanted our solution to be flexible, allowing for a large degree of possible permutations to fit within what develops on the ground in Cambodia. We also wanted our approach to hone in and engineer a solution to a single problem faced by the villagers of Pu Ngaol and not overcomplicate it.

## Our Solution

Our solution was to design a sedimentation filter to reduce the overall turbidity of the drinking water within the village of Pu Ngaol, allowing them access to the river and well water all year round, pairing with an Arduino light sensor that will be cost-efficient and used to effectively test the turbidity of the water coming out of the filter.

The simplicity of the design allows for multiple approaches to be considered in the long run. Our current model focuses on an individual household approach, but there is a potential for this design to be expanded and placed at community-run way stations, or at a centralized location for of the village, and then paired with a bleaching or UV process to kill off potential bacteria in the water. For the current model, water will have to be boiled after filtration to be considered drinkable. Our goal is simply to provide another tool in the arsenal of the community of Pu Ngaol to improve their access to drinking water. In addition to this, our simple design will be easy for the villagers to maintain, and create a user friendly product.

## Potential Concerns

The largest concern is that while this solution appears to be the most cost effective, there may be a need to import material for replacement within the filter, particularly activated charcoal and gravel, barring there is an insufficient quantity available within Pu Ngaol itself. With this, there is a potential that only more wealthy households will be able to afford the maintenance on these filters if they are only used on a household level. Care will have to be taken in implementing this solution to ensure equitable distribution of resources.



**Have Any Other Questions? Please Ask Us!**