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Cambodia, Water Sanitation

Improving Water Sanitation in Cambodia Through Technology

Have you ever questioned or worried about the water you are drinking today? Have you thought about the cleanliness and the safety of your water? The people who live in Cambodia do. Cambodia, a Southeast Asian country, is facing a challenge in providing access to clean water for most of its population. 70% of households in Cambodia do not have access to clean water (“Water.org”). The absence of clean water in Cambodia is because of multiple sources of contamination that can not be identified. Unsanitary water can carry diseases such as cholera, diarrhea, dysentery, hepatitis A, typhoid, and polio. For children, unsanitized water can affect the growth and development of their brains. Not only can unsanitary water affect people but it can also cause harm to the environment. If the water is contaminated with human or agricultural waste, it will cause cultural eutrophication. Eutrophication is when there is excess nutrients in a body of water. This will cause an algal bloom. This algal bloom will create a deadly positive feedback loop for the ecosystem. With the increased algae population, many will die due to limited resources, then decomposers will use oxygen to decompose the dead algae. Now since there is less oxygen in the water, other organisms will start dying, and they also will get decomposed. Given that, Cambodia’s problem of supplying clean water to the people and the environment is a national problem that needs to be resolved.

Cambodia is a relatively small country, and as of 2024, it had over 17 million residents (“The World Factbook”). It is a parliamentary constitutional democracy, meaning that its citizens have a symbolic hereditary figure but do not contribute to the policy-making process. However, due to this government, Cambodia also faces some human rights issues. The citizens are heavily restricted in their freedom of speech and assembly and are exposed to unlawful killing and torture.

The average family size in Cambodia is about 4.1 members per family. 61% live in rural areas and 77% are involved in agriculture, fisheries, and forestry. But according to Habitat for Humanity, 17.8% of people live below the poverty line. In Cambodia, 40% of the urban population lives in slum conditions. Especially in these urban areas, the people face great challenges in accommodating clean water. They do not have proper garbage disposal systems, drainage, or toilets which further complicates and worsens the problem. This leads to a high percentage of diarrhea and other waterborne diseases. (“Top 10 Facts About Living Conditions in Cambodia”) In rural areas, people dominantly live in villages near rivers. In these rural areas, there is even less access to amenities such as toilets and basic sanitation services. These rural areas also might not be the top priority for the government. Often, rural areas are overlooked since urban areas produce more waste since there are more people.

The challenges in providing clean water for the people in Cambodia are multiple sources of pollution and inadequate housing and infrastructure. Of course, there are other problems, such as a corrupt government that makes it harder for anyone to help the people, or the lack of money, and the list goes on, but these two problems are the biggest challenges in achieving clean water for Cambodia.

Inadequate housing and infrastructure not only prevent the implementation of clean water into households but are one of the big causes of water pollution. Even if there is water running into a house, if the water supply line is not carefully built, new problems such as lead poisoning arise. But most people in Cambodia don't even have running water. No running water means they also lack basic sanitation needs such as toilets and sinks. This causes diseases to spread rapidly. No running water also means that people aren't able to wash their hands, clean, and shower, which speeds up the process of spreading disease even more. So having a safe and definite water supply line is one of the key factors and a long-term solution for the future. However Cambodia lacks the financial resources to address and fix these problems because it's a developing nation. But even if the people did have clean water, they lacked the education to understand the importance of actions such as washing hands to protect themselves from diseases.

With many houses without proper waste disposal systems, it is evident that a lot of untreated waste is released into the environment. Not only waste from households, but fertilizers used in agriculture also run off into the environment as well as animal waste. These many sources of waste that are being disposed of into the water make it even harder to fix the problem because can't just fix one thing.

One solution that can be done is an aqua tower water filtration system that doesn't need energy. These are gravity based so no energy is required, so it is much easier to build and also to start using right away. It is also significantly less money than to use energy and build a filtration system. Having it low in cost is extremely important for Cambodia, since they lack financial resources. However, even though it is less than other filtration methods, of course, these are going to cost money. So it can be quite a challenge for Cambodia to get the money to build these types of infrastructure.

Another solution that can be used is, low-cost individual water filtration system. Companies such as Sawyer create gravity-based filtration that is low-cost and long-lasting. Though the water is lower in quality than the aqua tower filtration system, it is enough as safe drinking water. Two weaknesses to both of these solutions that I've introduced is that this can't be a permanent solution. This is only a temporary place holder for the people before we find a long term solution. The other weakness is that these solutions do not help solve the root of the problem in what is causing the water to be unsafe to drink. So if a long term solution of more amenities such as toilets are implemented, the lives of the people in Cambodia will not change.

Lastly, educating kids and adults about hygiene practices and how they are important is crucial to this. We can have plenty of clean water, but it is meaningless if people do not know the importance of hygiene practices. So if we can educate people on how it's important, they will be able to understand the importance of basic hygiene and implement them.

In conclusion, in order to aid Cambodia's water sanitation issue, there has to be a solution such as the aqua tower water filtration system, or the individual low-cost water filtration system. Of course, these are temporary and short-term solutions. We would also have to educate the people on the importance and how to perform basic hygienic practices such as washing your hands, but to increase the quality of life for the people of Cambodia, even just a little bit, this is extremely beneficial. There are many countries like Cambodia, with insufficient financial resources and a governing body that makes it more challenging to

solve these issues. But if we can work together and help the 17 million people of Cambodia, we will surely have clean water accessible for the people.

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