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Timor-Leste, Water & Sanitation

Timor-Leste: The Attainability of Fresh, Clean Water

English Historian, Thomas Fuller once said, “We’ll never know the worth of water till the well is dry.” and it’s true. Some of us will never understand the struggle of not having fresh and clean water to drink or to use daily (such as showers and toilets) because it has been accessible to some of us for so long. Nonetheless, this issue does affect millions of people across the country and the world regardless of whether any of us has ever experienced it or not. With that being said, an example of this issue and its drastic effects on people is in a country named Timor-Leste. Timor-Leste, also known as East Timor, is a country located in Southeast Asia that is south of the Malay archipelago. The country itself is known for its beautiful beaches along its coast and its statue of the Virgin Mary on one of its mountains named Mount Ramelau along with its mountainous terrain and dry yet tropical climate with a fair amount of rainfall. However, it is considered one of the least developed countries in the world with the majority of its population living in rural areas (about 70 percent). As of 2022, Timor-Leste has a democratic republic as its form of government with Taur Matan Ruak as its prime minister and head. The national languages in the country are Tetum and Portuguese. Steering back to the climate and geography of Timor-Leste, it does make farmers prone to using subsistence farming to cultivate and grow certain crops like rice, soybeans, cabbages, maize, sweet potatoes, etc. throughout different times of the year since about only 430 acres of land are suitable for farming. The average size of a farm with this in mind is most likely very minuscule when compared to the average size of a farm in a different country like the US (which is more than 441 acres). But, Timor-Leste does have multiple major exports that are cash crops like coffee beans which contributed 25% to the total GDP (gross domestic product) in 2003, beets, sugar, locust beans, and seaweed. Some of their main exports that aren’t food include marble, crude petroleum (which is usually exported to Singapore), petroleum gas, and sandalwood.

According to a 2010 census, the average size of an East Timorese household is about 5.8 people which makes sense since multiple households have different amounts of people in each one resulting in a decimal as the average. A typical house of a household will most likely be made of bamboo or wood and a roof made up of thatch if the family were to live in a rural area but if the family were to live in an urban area then their house will most likely be made of concrete and other materials that help make the structure stable. Sadly though, this huge divide exposes even more disparities between the housing of different classes with a huge percentage of the population living in poverty. This most likely means that their housing is either non-existent or inadequate due to the lack of basic amenities. A regular meal in a rural East-Timorese family would probably consist of fish if they live on the coast of the island, rice and other starches, eggs, meat, and occasionally vegetables like corn and onions. It’s also very traditional for most people in Timor to share their food no matter how much or how little they have even if it’s a struggle retrieving it every time adding to the aspect of hospitality in their culture. Some factors that allow for these struggles to exist include agricultural limitations such as lack of fertile soil for crops and harvesting or no transportation and not enough money to go to any of the nearest markets to pick up food. But, when a family isn’t experiencing these struggles and can find some food, the cooking process does become a little slow if done traditionally because a lot of the meats and vegetables are marinated with spices and liquids and then are slow-cooked. This issue of learning in itself is easily intertwined with the issue of

water and sanitation and its scarcity with 66% of schools having no access to functioning toilets and 40% of schools not having access to quality drinking water.

As stated in the first paragraph, the majority (mostly the rural population) of the East Timorese population experiences a lack of clean water, in multiple aspects. The World Health Organization states in their global analysis that due to Timor-Leste being a “newer” country, it has considerably lower access to coverage for water and sanitation when compared to other Southeast Asian countries but is still making its improvements when considering the fact that these specific services only target urban and rural sanitation rather than additional facets like promoting hygiene and having drinking water in schools. This issue (and other issues in general) has disproportionately affected people in rural areas rather than people in urban areas since people in these areas are more likely to experience poverty and food deserts. Women are also disproportionately affected as well since a lot of young girls and adults have to go through menstrual cycles but don’t have the proper education and resources for it which could easily be solved by implementing and integrating certain education plans and programs. Fortunately, in these times, the government and international organizations like UNICEF and ADRA International are actively trying to come up with ways to alleviate this problem of unclean water that has taken so many lives as a result with help of technology progressing every single day and raising awareness on the issue.

The best way the Timorese people have been trying to attain clean water themselves is by collecting dirty water from rivers or streams to filter and boil. This is a common strategy used by a lot of people to make drinkable water especially when they’ve run out. However, it does take a lot of endurance and time for just one person or a couple of people to collect gallons of water in buckets or jugs along with firewood to boil it. Not only is this a disadvantage to just getting clean water, but not boiling the water to a certain temperature (149° Fahrenheit) for a specific amount of time may not even kill all the deadly bacteria and microorganisms that are in it.

Nevertheless, some people are deciding to take action to solve this problem like the organization called “Plan International ” that began building more toilets in schools in Timor-Leste and educating teachers in these schools to start hygiene clubs for the students. In my mind, this should be expanded to rural and urban populations (with more of an emphasis on the rural populations due to certain factors like general access to resources and utilities) so that no one can be excluded from the important information that could potentially save so many lives and educate so many young women (when talking about the menstrual cycle). This could be achieved by adding seminars for the parents and others in the community. Furthermore, people of all ages should be able to attend and contribute the best way they can with help of funding from this type of organization as well as other NGOs (non-governmental organizations). As I will bring up later on, there could also be a possibility of the country of Timor-Leste funding it themselves as the whole world gradually reaches out of the COVID-19 pandemic. A way to even encourage those to come and respect their culture at the same time is to talk and discuss with the Timorese people who attend and see what is the best solution in their perspective as solutions are brought up and incentivize those who attend and contribute with individual Life Water Straws. These are personal drinking straws that filter out up to 99.9% percent of bacteria in water. This makes it easier for anyone who has it to drink water wherever they have it while bigger amounts of water needed for other necessities can be taken from the solutions that are implemented. Funding for this may also come from an organization or some type of partnership with the actual company of these straws. One physical solution that has been implemented and can be in Timor-Leste to combat unclean water is the Ceramic Water Purifier used in Cambodia which was created through UNICEF and its program on water and sanitation. This tool helped bring down the rate of diarrheal diseases (such as cholera) from unclean water to about 50% and reduced the chances of getting E.coli to almost 100% which makes it a great resource to possibly input into other countries such as this one. The way that it works is that the filter contains a porous cartridge made of ceramic that allows water to filter through and take away any foreign impurities such as toxic metals like lead and bacteria. It is done similarly to how water filters through the earth to eventually create groundwater.

Another physical solution that could solve the problem of unclean water in Timor-Leste is reverse osmosis. This is a system that allows water to pass through multiple filters to first eliminate any visible impurities than to eliminate any deadly contaminants like mercury or arsenic. Eventually, the purified water reaches a faucet where one can collect the water they need for drinking or use the faucet as a sink to wash their hands. Compared to the other solution, this one may be harder to implement since it will require bigger versions of the system to be put in different areas of the country so that the majority of the population can have the clean water that they need making the system even more unwieldy than it already is. Moreover, the system requires filters to constantly be replaced so the water doesn't become more and more "tainted" or just risky to drink overall and the government may not have the funds to put in enough systems since they are very expensive.

And as stated in the first sentence of the last paragraph, there is a lack of technical knowledge that may make it impossible to even construct them properly resulting in an obstacle that needs to be overcome with potential help from other countries and their organizations. If the government and citizens of Timor-Leste, community members, and organizations were to finally come up with a solution that would drastically reduce this problem or completely eradicate it, then assuming from previous evidence and examples from other countries that it likely either be funded by multiple organizations, international donations, help from neighboring countries, etc. In addition to these other routes of funding, Timor-Leste could redistribute its funding from its own country to support this issue. For instance, Timor-Leste has an investment fund owned by the government called a sovereign wealth fund where the country puts all of its "excess" wealth made from the selling of petroleum and gas into a bank account that is under the name of the East Timorese government. Occasionally, the government uses the money in this account whenever there are dips in the economy. For example, according to some economic reports of Timor Leste between April of 2020 and May of 2021 made by The World Bank, Timor-Leste had taken out about 250 million dollars to support the country as it had been and was going to continue to down an economic decline. The same could be done with this global issue. On the possible flip side, those who are perhaps against the government within the country would not support this method of funding for access to clean water. Although this type of issue has not been raised because Timor got its complete independence from Portugal in 2002, it's still something to take into consideration. Alternatively, in this case, representatives of those communities expressing such an opinion can meet with CSOs (Civil Society Organizations) within their regions to discuss a compromise. As the whole world slowly gets out of this pandemic, the money that is put back into the account from revenues could potentially be used to fund these solutions throughout the country. In the case of the reverse osmosis system, for example, one large system cost about 20,000 USD. If one large system were to be placed in all eleven regions of Timor-Leste then that would cost over two million dollars alone. Although that may not seem like a large sum of money when compared to the amount of money in the account, it still doesn't factor in compensation as well as the execution of other, more broad-scale or more local solutions. Even though there isn't a set estimate of what it will take to solve the water crisis in the country, we can find an estimate when compared to other places. For example, it took about 300-400 million USD to solve the water crisis in Flint, Michigan. The difficulty behind implementing a solution that uses money out of that kind of account, to add on, is the likelihood of having government legislators agree with it and make it possible. Many legislators may not like the idea of redistributing funds for an issue that does not affect them firsthand. This makes it almost unlikely that they will understand the gravity of the issue and vote in favor of such a cause especially if they think that dipping into these funds may be harmful if their economy ever goes into a recession in the future. On the other hand, the help of the Timorese people in raising awareness about the severity of the problem can gradually work its way up to the political pipeline making it possible to get government approval as it has worked in certain cases when it came down to pieces of legislation in other countries around the world.

To address any important details about implementing a possible solution or any of these other solutions that have been used in other examples of this national issue, certain policies and restrictions will have to

be set in place if the solutions need multiple construction workers to build them (like the reverse osmosis system) so that people don't possibly touch or affect the quality of machines and the water that is siphoning through. When setting any large-scale solution, it's also important to be aware of any indigenous lands that could be affected which is why a blueprint is laid out in front of those of the indigenous land who are allowed to approve of it or not. That's why when the time comes to implement a certain solution in native lands, the leaders of the project will either gain this approval from an authority for such a project that can only benefit the people. Alternatively, the leaders of the project and the leaders of the native lands can work together to create a different solution for that community to receive their clean drinking water if the original plan is not acceptable. Speaking of a possible solution, in the case of Timor-Leste, the best solution, I would think, would have to be the Ceramic Water Purifier since it sounds like it would be easy to construct, make the whole project large-scale, and there is already an example of this solution working in other countries which can be used as a reference of what Timor-Leste would have to do.

So, with all this information in mind, it's time to create an evaluated multi-step solution on how one or many of these solutions can be implemented to slowly alleviate the problem with water sanitation:

1. First, we use past and current data to figure out which hotspots of East Timor have a rampant/prolonged lack of clean, sanitary water and toilets.
2. Next, with the help of outside countries, organizations, their funding, and community members and leader of indigenous land, we can come up with the proper plans to implement what's best (whether that be the Ceramic Water Purifier, reverse osmosis systems, functioning toilets, etc.) and where to put it with respect to the lands they're on and the culture of East Timor.
3. Then, as these are gradually established, we take data to see if any changes need to be made or not. If there are no problems, we can try to expand to other areas where lack of water and sanitation is deemed as not as severe but still needs to be taken care of.
4. Finally, if everything works out correctly, the problem of water and sanitation can likely be alleviated or eradicated. However, there will still be officials (such as potential volunteers/workers) who make sure all the systems are in check and safe to use in their respective communities from time to time.

To reiterate, this plan is essentially just a rundown of what things may look like if everything is possible with the receiving of funds and buildings of filter systems and toilets, not an official plan to follow step by step in Timor-Leste if those quotas are filled. Holistically, this 4-step plan could just be considered a reference for that matter. Additionally, I have a concept for a type of machine filter that can be created in the future. Essentially, all you would have to do is pour a certain amount of water into the machine that is created and it filters out all the foreign impurities and pathogens. Then, the machine calculates the percentages of how many pathogens, impurities, etc. that were made up in that water and pulls it up on a small 4-inch by 4-inch screen that is at the top left corner of the front of the machine. Finally, it then dictates whether it is officially safe to drink by gauging the cleanliness of the water with a bar on the bottom of that screen and saying "Safe" or "Not Safe, Do Not Drink" in an automated voice that aligns with the language of the people that use it. Nonetheless, this is just a potential concept that I have come up with and can continue to work on as I expand my research on water and sanitation and gain more access to resources of my own.

To finally conclude, I would like to end with the quote "Alone we can do so little. Together we can do so much." made by Helen Keller. This shows that we can only achieve if we can collectively work together to help those in dire need, no matter how long the journey and no matter how many differences we have. Let us use this as motivation and continue our plan to make Timor-Leste and ultimately the world a better place, one step at a time.

Update: The government of Timor Leste just recently signed an agreement for a \$420 million dollar loan to improve sanctions involving the spread of education across the nation as well as alleviating the water crisis in the country.

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