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Mexico: A Better Way to Use Water

Background As Mexico's population continues to rise, increasing within the past half a decade to about 129.2 million people (Geo.Mexico). The heavily populated country is currently undergoing one of its most threatening health crisis from not having enough uncontaminated water to provide for its citizens (?). Mexico's struggle to obtain and upkeep a clean water system is a direct result of the discharge of domestic, industrial, agricultural, and mining residues. Mexico's government has taken little to no action in attempts to solve the issue regarding their water sanitation. The solutions that are offered by the government do not accommodate to all of Mexico's citizens. As written in "*The Washington Post*" like so many other people, there is Maria, a mother who lives in a poor Mexico City neighborhood without running water. She relies on expensive water deliveries, brought by trucks two times per week, to fill up buckets for basic household use (The Washington Post)." Because there is an essential need for clean water citizens are forced into paying high prices to get water delivered to their house strictly for household needs, not even supplied enough water to maintain for drinking or hygienic purposes.

Mexico is one of the most heavily populated countries in the world, with an increasing population of 129.9 million people. A majority of Mexico's population comes from its urban areas with a high percentage of 78.84% 21.16% being rural (Geo.Mexico). The countries population is overwhelming big and is only continuing to grow. The current president of Mexico Andrés Manuel López Obrador was elected on December 1, 2018, he runs the Mexican country in the form of a republic government (Britannica). Allowing citizen input in the decisions made about the country. Mexico is a country known for growing and cultivating crops, not only does the country produce goods they export as well. With 54.89% of Mexico's land that is cultivated the country is well equipped for upkeeping the production of their major crops (Tradingeconomics). Major crops consisting of maize, sugarcane, sorghum, wheat, and corn.

Mexico has one of the most unusual climates, with extremely cold winters, unbearable heat in the summer, and long lasting seasons of rainfall. Due to the country's extremely high elevation to sea level, Mexico can face some of the worst winter temperature making the season nearly intolerable for the natives. " Mexico City (Ciudad de México), with its much higher elevation of 7545 ft (2300 meters) above sea level, can reach freezing temperatures in the winter. You'll be surprised to find snow-capped volcanoes" (FocusonMexico). Mexico can experience some pretty harsh winter seasons, but it is nothing compared to the hot spring seasons. In Mexico, spring is considered the warmest season with temperatures reaching 90 degrees fahrenheit only in the earliest month of may. "Spring is the warmest

time of the year along lake Chapala. Daytime temperatures begin warming in March and reach an average high of 90 by May” (Focus On Mexico). Mexico has constantly changing weather from cold harsh winters

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to warm unbearable spring heat. The natives of the Mexican country are in for an unexpected surprise as each season comes around never knowing how hot or how cold the temperature will get.

Typical Family For a densely populated country like Mexico, it is not uncommon for the household to be of a larger compared to a standard household size. With over 129.9 million citizens residing in the country as of 2017, households are expected to be above the average size of a basic home (Arcgisz). The average size of inhabitants in the countries household is around 3.8 people per home (Arcgisz). The family size in Mexico seems about average when taking into account the immense population that the country has (Arcgisz). With having such a large family, most would think there would be some conflict on who eats what and who eats at what time. That never seems to be the issue seeing how in Mexico the families stick to strict diets and strict timing when it comes down to having a meal (Escapeartist). The most commonly found diet plans in the Mexican home would be foods that are high in fats and foods that provide high long lasting nutrients for the body (Escapeartist). The natives of the country stick to strict diets and along with those strict diets they also practice a lot of customs that are attached to their diet. “A traditional domestic diet: soup, rice, and stew being an essential part of the traditional Mexcian meal without leaving out salsa and beans” (Escapeartist). The diet that the natives of the country choose to follow gives their body long lasting nutrients and protein that their body needs to stay healthy and strong. Along with the diet they choose to oblige by they also have customs that they follow as well when it comes to the eating of the food. There are times in which they are supposed to eat and certain in which they should not be consuming anytype of food at all. “Almost nobody eats before 1pm (4%). 21% of the population eats between 2 and 3pm of after 3pm (about 37% each)” (Escapeartist). The rigorous eating diets and timing for the country is a big factor in the way a family is conducted.

Mexico does not have the best education system. In fact, they do not really have an adequate educational system for all of their citizens(Wenr.wes.org). Not having a beneficial education for the country is a direct result of not having enough funding for many schools(Wenr.wes.org). Much of the country’s funding was very low to begin with but as the years went on the country funding for education got lower and lower (Icfdn). “In 2014, the OECD noted that Mexico’s annual expenditure on spending per student was already well below the OECD average. Three years later, economic pressures have caused the Mexican government to cut their education budget by more than 11%. Mexico’s textbook budget has been cut by a third, and teacher training programs have been reduced by 40%” (Icfdn). Mexico was already suffering from a poor educational system because they were lacking the funds needed to accommodate for each student due to economical issues that Mexico has faced, the government was forced into cutting more of the school fundings which resulted in the country's educational to decline severely. As many of Mexico’s citizens are in dire need of a more advanced educational system they have one government provided program that is less concerning to everyone and beneficial to everyone. The healthcare systems in Mexico are on the countries best government provided program (Icfdn).

Healthcare in Mexico is considered to be one of the best programs that the citizens have (International Living). The country has amazing healthcare covers nearly all of its citizens who also have cheap and affordable healthcare that even extends to people who are outside of the Mexican country. “Every medium to large city in Mexico has at least one first-rate hospital. And a big plus is that the cost of

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healthcare in Mexico is generally half or less than what you might expect to pay in the U.S. (International Living). The same goes for prescription drugs. Prescription drugs manufactured in Mexico cost, on average, about 30% to 60% less than the same drugs in the U.S” (International Living). The country has an amazing health care that caters to all the citizens whether the citizens are poor or rich they will always be provided with favorable healthcare coverage (International Living).

Current Situation Currently, Mexico is undergoing a huge water sanitation crisis. The country is running out of clean water for natives to drink and for natives to use for hygienic purposes. Mexico has been undergoing this water crisis for over 100 years (NPR). The water sanitation issue in the country has been predominant for years now and has only been recently address within the past couple of years (NPR). The natives of the country have even given this crisis somewhat of a name, some call the crisis a “historic mistake”. Mexico was not always a country known for contaminated water, they were well known for their agriculture but soon lost their recognition for their agriculture and gained notice for their polluted water (NPR). The country did not always have contaminated water, years ago Mexico had sufficient uncontaminated water to last many years until an error arose. Ancient Aztecs thought of a brilliant idea to build their city on top of the lakes around them so that they would still have access to natural freshwater (NPR). Worrying about the flooding that may have occurred, the Aztecs built water systems in order to manage their flooding issue. “The ancient Aztecs first picked the spot. They built their city atop the huge lakes that filled this valley, leaving the natural freshwater supply intact around them. The city flooded back then too, but Aztecs probably the last civilization to properly manage this watershed, built a system of dikes to control the problem” (NPR). The country did not always of an issue with having clean water, the issue arose when conquerors attempted to expand the land draining nearly all the freshwater that the country had (NPR). With the expectation of the land essentially resulted in Mexico having nearly no clean water, forcing the country to rely on further water sources to survive. “The "historic mistake" kicked in around the 1600s, when Hernándo Cortés and his band of conquerors arrived. To make room for their expanding empire, over a few hundred years, the country slowly but surely drained all the valley's lakes” (NPR). With almost all Mexico’s clean water gone, they needed to find a new source of water in order to survive (NPR). The country would implement the use of pipes to bring water for various lakes. “Hundreds of miles of pipes now bring in about 30 percent of the city's water needs from faraway rivers and lakes. The rest comes from the valley's vast underground aquifer” (NPR). For many years now Mexico has been battling this issue for years now and it has affected the natives of the country in many ways, it has impacted their health, cleanliness, and financial stability.

Not having access to clean water is causing major issues financially in the homes of Mexico’s

citizens. With the overpriced and unreliable water delivery services families are forced to prolong and reuse the water for as many different tasks as possible until they have enough money to get water delivered to them again (Mexiconewsdaily). Occasionally the families use their water for almost everything which includes cooking, cleaning, and sometimes drinking (Mexiconewsdaily). The most prominent issue with these water delivery services is how unreliable in delivery they are. "There are, in fact, approximately 200 neighborhoods in Mexico City alone that rely on the delivery of water by tanker trucks. Infrequent water delivery forces many residents to use a variety of measures to save and recycle water" (Mexiconewsdaily). Having such a large neighborhood that needs clean water but can not get it is

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a bit strenuous for the citizens because now they are forced to reuse water that has been used multiple times. As Mexiconewsdaily went around the country asking about the water sanitation crisis, this is what one of the families had to say: "We use buckets when we wash dishes and reuse the dirty water to flush the toilet. When we shower, we use a container to catch the soapy water and we use that to wash the patio floor (Mexiconewsdaily). If we don't look for ways to reuse water, we run out. . . (Mexiconewsdaily). If the issue of reliable water deliveries does not get fixed, families will be in serious risk because of the lack of clean water that they do not have. For a family to have to reuse shower water to complete day-to-day activities when all they need is a reliable water delivery company is unfair to all citizens living in the country.

In order for our body to be fully functional and survive we must consume some type of food and water. Without food your body begins to slow down, of course your body creates its own sugar using fat but once it runs out of fat your body will eventually give in (AFR). By digesting the smallest bit of food will provide a boost of energy to help sustain the body unfortunately the same can not be said about water (AFR). Once your body stops consuming water side effects such as grumpiness, dryness in the throat and fatigued, and may develop a mild headache. If the body does not get replenished with the correct amount of water needed, then the body will mentally and physically decline. (AFR). After not consuming water of an extended period of time your body goes into a state of exhaustion and will eventually collapse (AFR). Water is an essential fluid for the body and without your body begins to decline and stops functioning (AFR).

Not having clean water in Mexico is an issue that if continued will begin to affect the crops of the country. The citizens in Mexico rely heavily on farming in order to get food. The main crops that are planted are barley, avocado, agave tequilana, and maize (Arcgisz). These crops are implemented in almost all the natives foods and eaten constantly. Without clean water these crops will not be able to grow as abundant as they would if there was clean water to plant the crops. Of course, during the rainy season, the farmers can rely on the rain to plant their crops but during times of heat they would be missing an essential component to growing their crops. With no crops growing this means two things: farmers are not making any money and that families are not having any crops to buy. Not having crops would result in families not having ingredients to make traditional foods or food in general. To successfully survive or have enough to survive another rainy season they would have to be very frugal with how they are eating

and how they use the crops that are already grown. Considering how large the population is and how much people are in a single house that would be considerably hard to do. The families would have to cut their meals into portions to satisfy every 3.8 person in the house. Having clean water is a dire need for citizens to survive, especially for Mexico being a country that is heavily dependent on farm crops to eat. Without there being any health crops, this would mean that citizens and more importantly farmers will have to become sparing with how they are distributing their crops and how they are portioning their food because of how little food they do have.

Solutions

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The best way for using Mexico to handle this issue of water sanitation is by collecting rainwater the country gets and use the rain water as a source of water supply. With the implementation of rainfall collection, there should also be pickup and distribution centers. The pickup and distribution centers should be within a 5 mile radius of each neighborhood for easy access. Along with collecting rainwater, another strong solution to this issue would be to build at least 3-5 water filters in each city in a 5 mile radius of each neighborhood. By building these water filters, Mexicans can take the contaminated water and uncontained water and put it to use. Instead of just relying on the collection of rainfall water, Mexicans can use the abundance of contaminated water and turn it into clean, safe, and reusable water. With new and advanced technology, it would be fairly easy to create a water filter that catches rain and runoff and filters that clean the contaminated water. The filters would be installed by a contractor outside of the country. With the installation coming from an outside source, the procedure would be pretty costly to install and would also cost a lot of time. To resolve our issue of money, the natives of the country could hold a local fundraiser to raise money in order to pay for the installation and travel fee.

On average, Mexico gets around 40 inches of rain each year (Liveandinvestoverseas). With all that rain, Mexico should design a water storage system in every city in Mexico that will catch the rain fall. Rainfall water is generally safe to drink and may be cleaner than public water, so Mexico should collect the rainwater and utilize it for the citizens and the country's need. Innovative Water Solutions is a rainwater collection company based in Austin, Texas. The company was founded by Blake West and Chris Maxwell-Gaines in March 2004. The idea to create the rainwater harvesting company came to Blake and Chris when they were reminiscing about how beneficial rainfall collection to them when they were serving in Peace Corps in Suriname, South America. The two owners of the company decided to make rain water storage systems that would collect water and keep it safe from contamination. The company provides rainwater harvesting installation for residential and commercial uses. By using this the Innovative Water Solution company, we are having licensed engineers come in and build tanks that collect vast rainfall and keep the water safe from contamination. We are filling up tanks of rainfall water and storing them in uncontainable PVC tanks that we can use by all residents all over the country. The

best course of action to take when building the water pickup and distribution centers would be to use a very popular construction company located right in Mexico. Topos Hidromecánicos de Mexico is a very popular and well used construction company in Mexico. The company specialises in projects that deal with water pipe installation and water storage security. This would be the best option to choose when building the pickup and distribution center. Blake West and Chris have used this rain water filter many times during their refuge in Africa.

A solution that would much simpler than creating rainfall water tanks would be take the contained water and purify it. There is an abundance of contaminated water in Mexico that is not being used, instead of letting the water sit there we should filter out all the toxic waste in the water and use the water for our needs. In order to filter out the toxins in the contained water, a water filtration system would need to be built. The same company that would aid in building the rainfall water harvesting would also be included in helping build the water filtration system used to clean the contaminated water. Rainfall only happens 5-6 months of the year and on average 40 inches of rainfall happens. Simply relying on the rainfall collection would be absurd, which is why it would be best to filter out the toxins in the water and use it for the countries needs.

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For Mexico to solve the water sanitation crisis they would have to use of rainfall collection tanks and water filtration systems to clean contaminated water. The country is very reliant on getting its water from other far away lakes and aquifers but with the newly installed water aquifers. An easy and almost long lasting fix to their sanitation issue would be to collect their the rainfall water that they receive during the rainy seasons and store them in PVC uncontainable tanks and also use their already contained water and filter out the toxins in the water. The two solutions provided are considerably two of the best options for Mexico has if it wants to upkeep and obtain clean, safe, and reusable drinking water.

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