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Yemen, Water & Sanitation

Yemen: The Worst Humanitarian Crisis in History

A humanitarian crisis is an event or series of events that are threatening in terms of health, safety, or well-being of a community or large group of people. Currently, the countries with the most threatening humanitarian crises are Nigeria, Somalia, South Sudan, and Yemen, the most critical (Geneva). Yemen is facing the worst crisis the world has seen since 1945 and need all the help they can possibly receive. With very little food, infected water, low pay wages, unsubstantial medical care, and no shelter, the people of Yemen are losing hope. It is estimated by the United Nations that 19 million people in Yemen need humanitarian help, which accounts for two thirds of the country's population. One of the main problems that the country of Yemen is currently trying to battle is that of water and sanitation. There is a severe lack of clean drinking water, and no proper sanitation system, making it easy for disease to spread and for many to suffer. A recent outbreak has been of cholera in the drinking water, making thousands of people sick, and have caused over one million deaths so far. Yemen is reaching its breaking point, and the people of a once beautiful country are on the brink of collapse.

Yemen, commonly known as the Republic of Yemen, is a country located on the tip of the Arabian Peninsula. According to Nations Online, the country is bordered by The Red Sea in the west, Saudi Arabia in the north, and Oman in the north east. It is also across the Gulf of Aden from Djibouti, Eritrea, and Somalia. The geography in Yemen is described as a mountainous interior bordered by desert with a flat and sandy coastal plain, and the climate of the area is a subtropical dry, with hot deserts and very low annual rainfall. The actual land area of Yemen is relatively small, only 527,968 square kilometers, which is equivalent to the size of the country Sweden or double the size of Wyoming. Despite its size, Yemen has a large population of 29.3 million people, and the capital of Sana'a houses 1,937,451 of the population (World Population Review). Most of the people in Yemen are spread out into rural and tribal areas, and most communities or living areas are miles away from each other. Currently in the most developed cities, only 35.19% of people reside, while the other 64.81% are spread across the country in rural sites. Arabs are the predominately residing ethnic group, along with Europeans, South Asians, and few Afro-Arabs. The national language is Arabic, but only about 50% of all people are literate. Yemen is a presidential republic unitary state and has been since the unification of North Yemen and South Yemen in 1990. Currently, 44.6% of Yemen's land is cultivated, and only 2.4% of the land is arable. Because of this, crops do not grow or have a very hard time growing to produce enough material to meet the needs of people. Major exports from Yemen include coffee, sorghum, oil, liquid natural gas, fish, and qat.

Family life in Yemen is tough, especially for families that live in rural areas. The average family size is roughly seven members, and the more family members, the harder it is to ration out food, water, and other commodities. Families live in small huts but, due to the grueling war that has been devastating the country since 2015, people must move constantly. People set up tents to live in, makeshift shelters, and some even resort to living in caves and the sides of mountains. In a typical family, a meal would consist of either rice or bread, potatoes, vegetables, and meat; usually chicken or goat. With deteriorating conditions, finding enough food to feed an entire family is hard, especially because prices are higher with little crop to be sold. Many people go days without eating anything, and aid is one of the only ways to get some substance. Most of the food given out are things that do not need to be cooked, and individuals

receive very little to eat. Over the last three years, Yemen is facing the worst famine it has ever seen, and over 18 million people are food insecure. As far as jobs go, most people in Yemen work as farmers or craft workers. Women typically stay at home with the children and tend to the house, and the men work all day. Qat is the biggest crop in Yemen, which is a plant that is chewed for its stimulating effects according to Dictionary.com, and many farmers grow and sell it for a small profit. The average pay wage in Yemen after tax is 8,830,338.96 IRR a month, which is roughly \$200 in USD. Imagine trying to feed a family of seven for a whole month with only one dollar and forty-eight cents. Families right now do not have the proper health care they need to treat diseases, injuries, infections, and common health issues, and completely rely on foreign and domestic aid. Aid helps but supplies cost money and are limited to the very basic, so therefore thousands go untreated. Education used to be thriving and growing in Yemen, but over 1.8 million children are out of school due to the war, and most do not know how to read or write (Moheydeen). Clean water is limited, toilets are holes in the ground, electricity is nonexistent, and food markets are rare. With the country war torn, there are no resources or money to buy necessities, making living in Yemen dangerous.

With everything Yemen is facing right now, water and sanitation are one of the biggest concerns. The country is currently facing a water crisis, and a very major one at that. The status of this situation is very severe, with water contamination, low water supply, and high temperatures that cause severe drought. Without enough rainfall, conditions continue to worsen, which affects every aspect of life in Yemen. Contributing to this trend of events are the qat farms that need water to grow the shrubs. The Arabian shrub needs massive amounts of water, and because so much of it is used to water the plants, there is very little left for drinking. Qat might be a successful crop for the country, but it is also a contributor to its downfall. According to BBC, agriculture uses 90% of the country's water, and the capital of Sana'a is expected to run dry in ten years. Half of the population has no water, and the people that do have access have to go to great lengths to obtain very little. It is extremely hard, with a war raging constantly, for Yemenis to get the bare minimum for survival. But, that is a normal day for most of them. Urban populations have more access to water, but regardless where the water is obtained, none of the water in Yemen is safe for drinking. A cholera outbreak struck the country in mid-2016 and has been expanding ever since. Kate Lyons, a reporter for The Guardian, has written that over one million cases of cholera have been reported, with 600,000 of those being children under the ages of 18. This is the worst outbreak ever in history. Haiti held the record, with 815,000 cases reported from 2010 to 2017, but Yemen has surpassed that in just six months. Children are sick and dying, the elderly are too weak, and men and women cannot provide water since everything is contaminated. The muhamasheen, Yemen's word for marginalized people, are the worst off seeing as they are at the bottom of the social hierarchy (Rashed). The quality of life is rapidly decreasing because of the lack of clean water. Without water, dehydration occurs, people are more susceptible to disease, and crops cannot grow. Without water for the agriculture, Yemen has no food or trading materials. Water is needed for survival, and Yemen is drying up.

There are, however, some solutions that can fix the water problems Yemen face, and hopefully improve its infrastructure and quality of life for its citizens. One of those solutions would be to limit the amount of water that is to be used for agriculture and enforce stricter laws over illegal well drilling and natural water reservoir harvesting. In this solution, the use of local and government law enforcement would monitor the water reservoirs, limiting the amount that would be used for agriculture and the amount that would be given out for drinking. This would allow more of the water to be used for agriculture to be repurposed as drinking water, and in turn improve community health and living conditions. Another strength of this solution would be that qat farms would not be able to continue growing the plants, as they require so much water. The reason this is a good thing is that qat is highly addictive, much like cocaine, and to grow less of it would help people in rehabilitating and stop new people from becoming addicted. While there are many positive outcomes, this solution also has its drawbacks. The law in Yemen is very weak, especially with a war happening, and there isn't much concern for water being wasted, surprisingly enough. There are not enough policies in place to prevent illegal harvesting, and lack of enforcement

would just allow people to continue it illegally. Having citizens help spread the word and help the government enforce these laws can make it more difficult for others to harvest illegally. Another weakness in this solution is that most of the farmers that grow qat make a profit off it and are not willing to give up farming it because it is their only source of income. Again, most of the people in Yemen are addicted to qat, and it would be extremely hard to prohibit the growing of qat altogether, as its withdrawal effects on addicted people would be massive. This solution is not very expensive but would require quite a bit of legal and political ties to put it in place, and many might not agree or want that. The government would oversee this, but with everyone being occupied with the war between Saudi Arabia, it is unlikely anything would be done in the time it needs to before water supplies run out.

Another solution that can be used to help fix Yemen's water crisis is desalination. Desalination is a process that removes salt and minerals from water, making it safer to consume. This a perfect solution for Yemen since it is located on the Arabian Peninsula and has plenty of access to ocean water. With this technique, sea water would be converted into drinkable filtered water, making access to water more accessible (Werft). There are however, many negative aspects to this solution. From the finding of Kate Fried, this process is very expensive, and to build a facility to carry out these processes requires major funding, something Yemen does not have. Even if it did have the funding and resources, the price of water would skyrocket because it takes so much money to make, and people would not be able to afford it. To make this process more affordable, people can eliminate other things they use, so that they can either help afford the building of the plants, or to buy the water that it makes. Technology is seen as taboo in Yemen, and it would be difficult for many people to accept these new buildings. By educating ordinary citizens, they can learn about the ways the technology is being used, how it helps, and why this new technology is for a better future. Technology can help to bring Yemen, a third-world country, into more of a developing country. Not only is desalination costly but is harmful for the environment and human health. The chemicals that these treatment plants emit hurt the land, air, and animals in an area. People are already sick and dying, and this only gives another way for people to become ill. Foreign funding could help to fund this, but even then, the uptake is too expensive for Yemen to maintain on its own. Strict policies would need to be set in place to make sure proper measures were followed and no illegal activity occurring, such as the selling of water that was stolen from the facility. Many people would also be weary to drink the desalinated water, as they fear it has not been properly processed and will make them sick. There would be an abundance of water to go around, but nothing is free in this world, and funding, maintaining, and selling this solution would be a hard task.

For a different type of solution to reduce water usage and to also help with the qat addiction problem, a new crop can be replaced that will still bring the country money while saving water. This solution is not directly related to the production of clean water but will help the country save the water they already have. The coffee bean plant is the crop that can help save Yemen. The country has a vast history with coffee and are believed to be the first to ever brew coffee (Campbell). According to the World Coffee Research, the first archaeological evidence of beverage coffee consumption was found in the Yemeni city of Zabid. In Yemen's capital Sana'a, Mocha was the principal port city, until it was eclipsed in the 19th century. Along with the name Mocha, the port was a major exporter of coffee beans; some of the highest quality in the world. The climate in Yemen is perfect for growing coffee, because it is so dry and humid. Yemeni coffee beans are processed in a very old way called "dry processing." The cherries are picked from the trees and left to dry in the sun, making them shrivel up. Once they are dried, the shell is removed, revealing the bean inside. This is what gives Yemen's coffee such a unique flavor compared to other types of beans. Since drying the beans does not take any water, the crop is a possible solution to Yemen's water crisis. The only water that would be used would be to grow the coffee plant itself. Qat, the plant of choice in Yemen, requires 130 gallons of water per day. Growing a coffee plant would only require 37 gallons of water. This is a drastic difference and can be used to a great advantage. By growing more coffee, Yemen can once again become a major exporter. The only downside of this solution would be that the supplies for helping to produce the coffee can be costly. Generators are running constantly,

using lots of electricity, and special bags are needed to retain moisture. But to these problems, the bigger problem for Yemen is water. By implementing the growth of coffee and decreasing the amount of qat grown, Yemen can save tons of water, export more product, and start to rebuild its economy.

Continuing, a solution that could drastically improve conditions in Yemen is building waste water treatment plants. A waste water treatment plant uses bacteria and osmosis to filter waste water into clean drinking water. Namibia, a country where water is very scarce, and droughts occur almost year-round, uses this method to recycle what little water they have. They have been doing this for almost 50 years, and is very effective, both in sanitation and distribution of water (Gross). This solution would recycle the water already being used by Yemen and is perfectly safe to drink. By doing this, Yemen can just recycle the water they use and not have to worry about a shortage. This solution is not too costly but requires a lot of effort. One big obstacle that stands in the way of this is the use of a sewage and sanitation system, which is something Yemen does not currently have on a large enough scale. Without this, waste water cannot be recycled, and there is no point in creating a facility that costs money and resources when it will not be able to be used. Another weakness in this plan is that recycling the water does not completely get rid of all bacteria, and most of Yemen's current water is infected with cholera and the bacteria that causes diphtheria. Treatment plants can be costly, but by educating people and helping them reduce other things they use in their lives, a plant to help clean their water is worth so much more. This solution is sustainable, and with proper funding can improve the water and quality of life. By recycling water, everyone will be able to get their needs met and water scarcity, sanitation, and quality will improve.

Comparing the problems to the solutions Yemen has right now, the odds are not in their favor. The Yemeni people will continue to suffer as these events continue and will continue to get worse until large scale help is put into place. The future looks grim, but there is one final solution that can give Yemen some hope, and that is education. This can often be overlooked, because this solution does nothing to physically help, but it does so much more. By educating the people of Yemen on the resources they use, the things that are happening to them, and ways to cope with the world around them, the people with no hope can become stronger. Mothers, young wives, and girls can learn how use the little water they have accordingly, the best crops to plant that take little water, and how to get by with hardly anything. Men and young boys can learn how to grow new crops that take less water and how to make a little go a long way. By having someone come out and teach the Yemeni people all these things and more, they can get by much better. Families will not have to live in fear anymore, because they will know more about themselves and the war around them. The wonderful thing about education and the knowledge it brings is that it can be spread around. It doesn't take a fancy smartphone or texting to tell someone about something that is learned. Because most of the people in Yemen live close together, information can spread quickly. Everyone can share their knowledge, put ideas together, and become stronger. The spreading of knowledge is free, and once it is taught to one person, they can continue the path and keep spreading it. This solution is painless, free, and helps people greatly in need. The only thing that stands in the way is finding people who would be willing to do this job. Yemen is a dangerous country, and not many people are willing to put their life at risk to go into a foreign country and help complete strangers. The spreading of information is quick and can also be done by people from other countries. Many of developed countries, such as Great Britain, Canada, and the United States, have citizens that use social media all the time. By sending out a message that Yemen needs help, others can see that and spread the message. If so many people do this, someone with the resources or contacts is bound to reach out and do something to help. Technology has grown and is a miraculous resource of the modern day, and what better way to use it than by helping people in need. By spreading knowledge and information, and educating the local people of Yemen, thousands of lives can be saved.

Yemen is a beautiful country with a rich history, but all of that has changed in recent years. With a war going on between Saudi Arabia, lack of resources, and poverty, Yemen is one of the most underdeveloped countries in the world. Yemen is on the brink of dying and need desperate help for its citizens. Water is especially of a concern because of the lack of sanitation and hygiene, severe droughts and low rainfall,

and the wasting of water. By putting more restrictions and limitations on water, such as limiting the farming of qat and having laws preventing illegal harvesting, Yemen can conserve water to use for drinking and other more important purposes. Desalination and waste water treatment plants are options to make water that will lessen the crisis by providing people with more clean, drinkable water. By using these methods and solutions, Yemen may have a chance at survival and a chance at a fresh start.

Bibliography

Fried, Kate. "Ocean Desalination No Solution to Water Shortages." *Food & Water Watch*, Food & Water Watch, 22 Sept. 2015, www.foodandwaterwatch.org/news/ocean-desalination-no-solution-water-shortages.

Werft, Meghan. "Is Desalination the Answer to Water Shortages?" *Global Citizen*, Global Citizen, 1 Sept. 2016, www.globalcitizen.org/en/content/is-desalination-the-answer-to-water-shortages/.

Gross, Daniel A. "Recycling Sewage into Drinking Water Is No Big Deal. They've Been Doing It in Namibia for 50 Years." *Public Radio International*, PRI, 15 Dec. 2016, www.pri.org/stories/2016-12-15/recycling-sewage-drinking-water-no-big-deal-theyve-been-doing-it-namibia-50-years.

Rashed, Ansar. "Yemen's Marginalized Children Caught in the Middle of Conflict." *UNICEF*, 8 July 2015, www.unicef.org/infobycountry/yemen_82502.html.

Lyons, Kate. "Yemen's Cholera Outbreak Now the Worst in History as Millionth Case Looms." *The Guardian*, Guardian News and Media, 12 Oct. 2017, www.theguardian.com/global-development/2017/oct/12/yemen-cholera-outbreak-worst-in-history-1-million-cases-by-end-of-year.

Ruhayem, Rami. "Yemen Facing Water Shortage Crisis." *BBC News*, BBC, 21 Aug. 2013, www.bbc.com/news/av/world-middle-east-23777176/yemen-facing-water-shortage-crisis.

Burrowes, Robert, and Manfred W. Wenner. "Yemen." *Encyclopædia Britannica*, Encyclopædia Britannica, Inc., 16 Mar. 2018, www.britannica.com/place/Yemen/Daily-life-and-social-customs.

"Qat." *Dictionary.com*, Dictionary.com, www.dictionary.com/browse/qat.

Zahran, M A. "Qat Farms in Yemen: Ecology, Dangerous Impacts and Future Promise." *Egyptian Journal of Basic and Applied Sciences*, Elsevier, 5 Oct. 2013, www.sciencedirect.com/science/article/pii/S2314808X13000031.

"Yemen Population 2018." *Yemen Population 2018 (Demographics, Maps, Graphs)*, worldpopulationreview.com/countries/yemen-population/.

"___ Yemen." *Yemen - Country Profile - Republic of Yemen - Middle East*, www.nationsonline.org/oneworld/yemen.htm.

Geneva. "Ten Humanitarian Crises to Look out for in 2018." *IRIN*, 2 Mar. 2018, www.irinnews.org/feature/2018/01/01/ten-humanitarian-crises-look-out-2018.

Moheydeen, Khalid. "Education in Yemen Struggles after More than a Year of Conflict." *Voices and Views: Middle East and North Africa*, 7 Oct. 2016, <https://blogs.worldbank.org/arabvoices/education-yemen-struggles-conflict>.

Campbell, Monica. *The quest for coffee from a war zone*. 12 February 2018. 31 July 2018.