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Dominican Republic, Water & Sanitation

A Secure Solution to the Clean Water Crisis in the Dominican Republic

Water is essential for all life. Many countries, however, have difficulty finding clean water for their communities. The Dominican Republic is just one of the many countries that faces this problem. In developing communities within the country, one of the main limitations for development is clean water scarcity. With only a small percentage of the population having access to clean water, things such as sanitation are reduced. A better water supply not only helps the community thrive, but it also means a better quality of life for all the people of the Dominican Republic.

The Dominican Republic is located in the Caribbean where it shares half of the island with the country of Haiti. The capital, Santo Domingo, contains approximately 3 million people and is very modern; however, it also is full of a rich and distinct history developed over the years. The Palacio Nacional, also known as the National Palace, can be found in Santo Domingo. It is home to the President and Vice President's offices. Similar to the United States of America, the Dominican Republic is a representative democracy with three branches of government: judicial, executive, and legislative. The geography consists of valleys along with a few mountain ranges such as Loma La Pelona. The climate in the Dominican Republic stays relatively constant with temperatures remaining below 90 degrees. May through November is their rainy season; however, hurricanes are most prominent in June to October. The combined climate and valleys allow for agriculture to thrive. The CIA estimates that as of 2018, 51.5 % of land was used for agriculture. Farmers primarily grow rice and sugar cane along with other crops like bananas and tropical fruits. As claimed by the International Fund for Agricultural Development, "Agriculture is the fourth-largest economic sector in the country, employing nine percent of the economically active population in 2019." The pay per month can be from 6000 Dominican pesos (125 U.S dollars) to as low as 234 Dominican pesos (5 U.S dollars) based on the type of job as stated by expat.com. Most employees in the Dominican Republic work for higher paying jobs, like in the government or manufacturing. The agriculture sector lacks employees even though it is crucial for trade with other countries. In the Dominican Republic, family bonds are very strong with multiple generations living in one household. As reported by everyculture.com, "The family unit often includes grandparents, parents, and unmarried siblings, along with married brothers and their wives and children; married daughters become part of their husbands' families." These multi-generational families allow for their culture to thrive and be passed down from one generation to another.

The Dominican Republic is home to approximately 11 million people, of which only 74% have access to clean water. Most of these people can be found near cities, but the other 26% lacking clean water are found in rural areas. The lack of clean water began due to the many natural disasters that have swept through the country. These disasters damaged septic tanks, causing the water supply to be contaminated

with waterborne diseases and bacteria. Animal feces also caused contamination in the water supply. Cholera and diarrhea are just a few of the diseases that can be spread in contaminated water. The Pan American Health Organization, "… confirmed 12 new cholera cases since the last report on 17 February, bringing the total number of confirmed cases to 88…" (as of March 4, 2023). The Dominican Republic is also home to many dams which also serve as a source of drinking water. The Rincón Dam, located near the town of Rincón, has many purposes. According to Visita Dominicana, "[t]he Rincón Dam has multiple purposes; among them, water for human consumption, irrigation for agriculture, production of electrical energy and fishing." Many people, especially in impoverished areas, are forced to drink contaminated water even though they know the risks and consequences. While most of the health care in the Dominican Republic is funded by outside sources, Expat Financial states "… public hospitals lack quality medical equipment and staff." Due to the lack of proper practices, many of these diseases can lead to very serious sickness or even death. Children are most affected by these diseases due to their lack of immunity. While bottled water seems to be a solution to this issue, high prices make it difficult for everyday citizens to obtain it. The Borgen Project states "[i]n the communities of the Dominican Republic, 40% of households spend roughly an eighth of their income on water." After a while, many families don't have the money to continuously buy bottled water for everyone in their family. They must use their income on other necessities such as food, even if it means that they must drink the contaminated tap water. Water found in water bottles can also be contaminated by using filthy containers. Millions of people are at risk of deadly diseases every day because of the contaminated water they drink. Without finding a solution, more and more people will become ill and will be left spending most of their income on bottled water.

A clean source of water is also needed for agricultural reasons. Water is an essential part of the growth of crops. The Centers for Disease Control and Prevention states "Irrigating crops with contaminated water can then lead to contaminated food products which lead to illness when eaten." While people may not be drinking the contaminated water, they are eating food products that have been contaminated with certain diseases. Clean water is also important for livestock. The Dominican Republic is home to beef cattle, pigs, and dairy cattle. If livestock drink polluted water, then "[p]athogens may be transferred to the animal, and animals may consume less water if there is a quality issue, causing them to gain less weight and be more prone to illness." as stated by Neogen. Agriculture is an important part of the economy in the Dominican Republic. While they primarily grow rice and sugar cane, it's very important to have clean water sources for watering their crops so they can produce the best food for their citizens. Having access to clean water enhances the economy overall. Clean water is needed in many sectors of the economy such as agriculture and tourism. The Dominican Republic is known for their beautiful beaches, and tourism is one of their main economic sectors according to statista. Reducing pollution and waste allows their beaches to stay clean and allows them to draw in more tourists. "In 2022, the revenue generated by the tourism sector in the Dominican Republic amounted to approximately 8.4 billion U.S. dollars, growing roughly 48 percent versus the previous year" reported by statista. Maintaing a healthy environment in the Dominican Republic with the use of clean water will help their economy grow year after year. Finding a solution not only improves the health of their citizens, but it also improves their agriculture and tourism leading to a better economy.

Many projects began in the Dominican Republic in hopes of developing safer waterways to improve the sanitation of water. The first project was created by The World Bank and is known as The Water and Sanitation in Tourist Areas Project. According to The World Bank, "[t]he Water and Sanitation in Tourist

Areas Project built on a previous World Bank intervention to introduce deepwater submarine outfalls for small towns as a solution for wastewater treatment and disposal." This project directly impacts smaller rural communities farther away from the city. The deepwater submarine outfall is a pipeline which carries contaminated water away from the cities and disposes of it under the ocean's surface. While these pipelines are efficient in improving the sanitation of water, they can have harmful effects on the marine environment. During the building process, the assembly of pipes can lead to metal fragments drifting throughout the ocean. This pollution can alter the environment and lead to animals consuming these small pieces. If these pipes begin to leak, the contaminated water will disperse into the ocean leading to ocean acidification. This affects marine animals by making their living conditions difficult to survive in. A solution to these matters is a building material, like a type of metal that is safe for the environment. However, this metal needs to be strong enough to transport contaminated water without leaks. Magnesium is the perfect fit based on these limitations. Allite Inc. states "[d]ue to its widespread natural occurrence and the way it is harvested and processed, magnesium is considered the most eco-friendly and sustainable metal in the world." Magnesium is sourced from sea water as well as minerals. This allows for magnesium to dissolve naturally causing no effect to the environment. This metal is very light while still being durable enough to transport water through it. As of May 27, 2021, The World Bank donated 43.5 million dollars to the Dominican Republic to improve sanitation. This project is known as The Water Supply and Wastewater Services Improvement Project which explores ways to make sanitary water more accessible to less fortunate households. This project was initiated after the COVID-19 pandemic to help reduce the spread of this virus. According to reliefweb.int, it states "…the project will support efforts to promote hygiene practices, such as handwashing, through different media channels and social outreach efforts…" This project is efficient in not only making clean water accessible, but also preventing the spread of diseases. The World Bank has helped improve the sanitation of water in rural communities which allows citizens to live safer and better lives. In other countries, different projects have been implemented to try and fix their water quality. Some countries, like the U.S. have worked with the UN Water Conference which helps raise awareness about supplying clean water. The U.S. guaranteed 49 billion dollars to fund clean sufficient water after the UN Water Conference in New York at the end of March 2023. "A large suite of funding organizations nourished our country's water expertise, such as the National Science Foundation (NSF), National Institutes of Health (NIH), Ford Foundation, the US Department of Agriculture (USDA) and many others." according to The Hill's "2023 UN Water Conference: How can the US capitalize on the momentum?" All these organizations have helped the U.S. by funding programs that go towards creating a cleaner and safer environment for their citizens. Haiti, the neighboring country of the Dominican Republic, has implemented the WATSAN project with the help of USAID. This project uses software to follow the performance of their water systems. This is monitored by the National Water and Sanitation Authority; however, it also allows citizens to receive personal invoices for their system. Incorporating software could be the next solution to the Dominican Republic's water crisis. While this project would need lots of funding, it would allow the government as well as the citizens to know when their water is safe to drink, which will reduce illness, lead to a safer community, and reduce the need for bottled water. Plastic water bottles are also a major source of pollution. This funding could come from The World Bank as they have already funded many projects to improve sanitation. In the future, the Dominican Republic must look for other ways to not only monitor their systems, but also to allow access to clean water for more of their citizens. Most of these citizens live outside of the major cities where they lack adequate communication with the local government. Educating our local communities on issues like clean water scarcity can help find ways to give people better access to clean water in the Dominican Republic. Not only do we need to fix this problem, but we also need to help raise awareness for these smaller communities that are facing these large challenges.

In conclusion, many countries like the Dominican Republic need better access to a clean water supply. Raising awareness of this growing issue will lead to more solutions being made to help with this crisis. No matter how big or small a community is, each one needs access to clean water so that these communities can feel empowered and allow them to once again thrive. Clean water gives people a sign of hope and helping these countries obtain this will give a means for a better tomorrow. The solutions to these challenges lie in our hands, and if we all come together, we can solve them as well as many others.

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