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Aruba, Water Scarcity

Aruba: The Vacation Spot With an Unforeseeable Future

White sand beaches, temperate weather bordering on hot, the ideal vacation destination. Who could want anything more. The clear skies and seemingly endless amenities are what make Aruba the primary destination for traveling families, couples, acquaintances, or anyone looking to get away from the drag of everyday life and get a glimpse of a Utopian society.

Aruba is a peaceful place to get away from the hustle and bustle of city living because it, unlike countries similar to the United States, has a relatively small population. Aruba has a population of about 105,670 as of 2018. This country is tiny compared to the United States that has millions of people and seemingly minuscule when compared to countries like China that have billions of residents. Aruba's serenity is also due to its nearly even split of urban and rural land. Being able to have the common amenities of a city and the down home comforts of rural, farm life. With 40.7% urban and 59.3% rural, Aruba gives the best of both worlds.

The climate of Aruba is ideal as well. At a comfortable 30°C, or 86°F, Aruba is a tropical destination at its finest. Aruba's dry, flat geography allows their beaches to be as lush and prominent as possible.

As far as the government style of Aruba, a Constitutional Monarchy reigns. Their country is lead by a prime minister. As of 2017, Aruba's prime minister is politician Evelyn Wever-Croes. She is the first female to hold the title of prime minister in Aruba. This gives off an air of acceptance and equality because a powerful position that has historically been held by men has now been acquired by a woman.

Of Aruba's 59.3% rural land, 11.1% of it is cultivated. Their major crops are: sugar, cotton and tobacco. Their major exports are: Refined Petroleum, Hard Liquor, Scrap Copper, and Petroleum Gas. Similar to other vacation spots, like Brazil, the major crops of Aruba are more so cash crops than crops used to sustain the population. Having substantial food crops are not as much of a necessity for Aruba since they have a relatively small population. These cash crops have proven to be enough to keep their population at bay.

Aruba's average family size is also very small. The average woman who resides in Aruba has 1.83 children, just under the amount needed to replace their parents. This keeps the population small. 70% of Aruban household has three people or less living in them. There is also a certain culture in Aruba where

groups of unrelated people live in the same household. These families typically have diets consisting of corn, goat, fish, vegetable stews (stoba), rice, and chicken. This food is often acquired from local vendors. A popular style of preparing these dishes is through stews.

Minimum wage in Aruba is \$4.83/hour for domestic jobs. As of 2018, the minimum wage in the United States is \$7.85/hour, over \$3 more than Aruba's minimum wage. This is due to the United States being one of the most developed countries in the world. This small minimum wage causes challenges in average family life.

Aruba is the proud proprietor of one of the best healthcare systems in the Caribbean. This system comes at no cost to their residents and is of good quality. Since Aruban citizens do not have the expense of healthcare, their minimum wage seems more appropriate for the needs of their families.

The average family has access to amenities that they may need such as clean water, electricity and food. This is not true for all families in Aruba. The water that is available is distilled salt water. Aruba does not have a major source of freshwater.

Water is essential to life. Clean water is even referred to as a fundamental, inalienable right that all people have. There is an approximate 33% increase in water prices when compared to the prices of bottled water in the United States. The overall consumer prices are about 29% higher than that of the United States. This puts a major burden on the residents and could potentially drive out their large tourist population.

The current state of Aruba, in terms of water availability, appears bleak. There is no source of freshwater for the population and the small reservoirs of water that may exist to nourish small amounts of people are not being replenished due to this country's lack of rain. This country's rain is not out of the ordinary but, considering their lack of drinking water, the country would benefit from more rain during its rainy season.

Aruba's current solution is to use distilleries to desalinate their nearby water sources. This is how the country gets its water that is not shipped from other countries via shipped water bottles. As the world continues to increase in population, each country gets more and more citizens. As the population of Aruba increases, there is an increased need for distilleries and desalination plants. This trend is not sustainable because desalination plants are detrimental to the environment. Desalinating water causes the remaining water to increase in salinity. This is due to the brine, or the extremely salinated water that is filtered out, is being returned to the body of water that the water came from. This can also be a detriment to the aquatic life that lives in said water. The fish, in response to their newly salinated environment, would migrate and leave their former environment to be inhabited by molluscs, algae, and nematodes.

A possible way to work around this major water issue is to continue the desalination process and to work with the brine. This concentrated salt water, although it appears unusable for most instances where water is needed, can be used to water certain perennial plants. Plants such as the Daylily, Lantana, Prickly Pear, and Lavender Cotton can survive in soil with a high salt concentration. The brine that is considered waste and is usually returned to the bodies of water can be used above ground to water these plants. This will allow the sealife to remain in their habitats and the water will maintain the same of percentage of salinity. This method would allow the population of Aruba to continue the usage of desalination plants. One pitfall to this idea is that these plants are not indigenous to Aruba. The transportation needed to have a mass amount of these plants in Aruba would emit CO₂, which is a major air pollutant. Considering the large amount of water needed to sustain the home and visiting population of Aruba, there would need to be a large amount of plants to take up this brine. This transportation would require more than just one or two car trips. The amount of CO₂ added to the atmosphere would be substantial. The country of Aruba would need to decide if sustainability is worth the price of worsened air quality.

The two most widely used forms of desalination are reverse osmosis and thermal desalination. Although some believe reverse osmosis, or the process of filtering water through a series of semipermeable membranes, is better for the environment because it does not require or release copious amounts of heat, there are also negatives to this process. Reverse osmosis has been reported to remove beneficial minerals from water and have adverse effects on health by the World Health Organization. Due to this being more directly harmful to the people of Aruba, it would be wise for the country to convert all of their desalination plants to using thermal desalination in an attempt to have and distribute water that will not only prevent the population from thirst, but also nourish it.

Within the United States, certain cities have resorted to purchasing drinking water from other areas. Although this has been working for the past few years in places such as Nevada, it is not sustainable. This is another way to benefit the people of Aruba in the short term. This solution, although temporary, will take quite a while to show adverse effects. The world will not be at a place to stop using plastic anytime in the foreseeable future, so an extra five billion bottles, only a tenth of the amount the United States uses, will not add too much of a significant increase in the environmental issues the world currently faces.

If Aruba were planning to put the idea of using the brine to water plants into practice, the responsibility of the expenses would fall into the hands of local corporations of Aruba. Although Aruba's lack of clean drinking water is to no fault of their own, this burden should not fall on the shoulders of the rest of the world. These plants could be procured via nonprofits and civic organizations as to not strain the funds of the government.

If the switch to thermal desalination were to be carried out in Aruba, the World Health Organization, who did the initial investigation on reverse osmosis, could be a possible donor to the effort to transform the existing desalination plants and check for efficacy. The World Health Organization has a history of being an advocate for those who live in the world. Even if they are not able to contribute monetarily, their

efforts of providing the affected people with knowledge of the issues and how to resolve them is valuable.

If the brine solution is used, a possible role of the communities and the government in Aruba is to have laws or recommendations from the governing powers to plant certain plants that can thrive in saltwater. Once again, in the United States, this has proven effective. California has certain water laws that inhibit copious water usage. The difference between the countries is the permanence of the situation at hand. California has just recently gotten out of a drought, so they were merely awaiting the replenishment of their resources. Aruba, given their permanent state of no drinking water, would be forced to continue these practices to continue life as they know it.

In order for this theoretical policy to be successful, there would have to be a mutual understanding of the sacrifices that must be made by the people of Aruba. When developing this plan, their culture of buying from local vendors would need to be taken into consideration. Aruba, as seen in their cuisine normalities, is accustomed to buying and selling locally. If freshwater is exported from other countries, this may run the risk of taking away their self sufficient, independent state of being. This may narrow down the choice of which sustainable solution to use.

The idea of reusing the saltwater brine is sustainable because of its environmental friendliness. This allows the usage of distilleries to be more sustainable. Any air pollution that comes as a result of thermal distillation, be it the release of greenhouse gases or the burning of fossil fuels, is counteracted by the plants that are being grown. The plants breathe in the CO₂, a commonly found atmospheric pollutant, and release oxygen.

This solution, to import plants that are able to survive on the salty brine of the distilleries, is overall very simple and affordable. This does not require a lot of outreach from other nations and allows Aruba to continue their practice of taking care of others through independent hospitality. Compared to other possible plans, this does not require much money or change. The country would be able to continue their usage of distilleries and make them more sustainable.

Every seemingly perfect place has its pitfalls. Aruba, a seemingly thriving oasis, is actually a near desert country that is in need of a solution to sustain its population of people who expect so much from it. Those white sand beaches are actually hiding the secret that many other countries are more vocal about. The warm weather gives way to brutal days without water for the populus. Just know that in the vacation spot of your dreams, everything is not always as it may seem.

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