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Brazil, Factor 2: Water Scarcity

Brazil: Water Scarcity in the State of Ceará

Brazil is considered an agricultural superpower due to expansive, mostly rich land and large production and export of agricultural goods such as soybeans, oranges, cocoa, and coffee. In addition, the Brazilian cattle and poultry production is exported worldwide (1). Despite Brazil being considered an agricultural superpower, poverty is abundant within the Northeast parts of the country. The State of Ceará is located in the Northeast of Brazil and it is home to over 8 million people, with more than half of the population living in sub-urban or rural areas. About 90% of Ceará's territory is located in the semi-arid climate and the state is considered one of the poorest states in the country. According to the Brazilian Institute of Geography and Statistics (IBGE) census from 2010, Ceará has a high proportion of its population living in extreme poverty. This line, as defined by the Ministry of Social Development (MDS), is a per capita monthly income of 70 Brazilian Reais in 2011 (at current conversion rate this is equivalent to about \$21 dollars per capita/month). In 2011, the Ministry classified 17.8% of Ceará's population as living in misery (2).

A farming family in rural Ceará typically consists of 4-5 family members (mother, father and 2-3 children). The family usually lives in poverty and owns or rents a very small piece of land for subsistence agriculture. Since Ceará is located in the semi-arid climate, it suffers deeply from water scarcity. Shortage of water means less food and jobs. Due to these extreme low wages, a member of the family may migrate to more urban areas, for example to the State of Sao Paulo in search of seasonal jobs. The migration of the father can last for an indefinite amount of time. Child labor is not uncommon in this situation as children usually help their families with subsistence duties, making them unable to continue attending school in some situations. The common family meal may consist of rice, beans, and a grainy flour called manioc or yucca flour. If the drought does not compromise the availability of the fruits from the cashew tree as well as passion fruit, those would also be part of their diet. Though many of these things are simply not available due to lack of water for these trees and plants, let alone the cattle and other animals the farmers also have to feed.

The typical small farm in rural Ceará revolves around subsistence farming with the family utilizing primitive agricultural technology. The common tools used for farming include a hoe, a sickle and plow. Some of the more common plants produced include cashew nuts and sugar cane, and carnauba wax. If the crop yields are more than the minimal needs for the family, which is not common, then the additional produce is either exchanged for other goods or sold (3). But there are major problems that make this job harder in Ceará than in other places that include education, diseases, and most of all, water scarcity.

One of the greatest barriers is with no doubt water scarcity. It leaves families with less crop yields and less safe drinking water. Continuous droughts lead to uncontrolled low river levels, taking a toll on everything nearby. The Cearans get an average of 64 in. of rainfall per year (4). When compared to here, in Iowa, we get 38 inches of rain yearly (5). In addition to that, we have lots of rivers which get a large amount of water from the many inches of snowfall during the winter. The snow melt fills up the rivers during spring, sometimes leading to floods. Iowan farmers have a huge advantage on these farmers and the farmers of Ceará deserve a better chance at life than the chance they are forced to have.

Typical education for a rural family living in poverty in the State of Ceará is below Brazilian average. There is a high proportion of illiteracy. According to research done by Brazilian government agencies PNAD/IBGE, in 2012, it reported that the states in the North East portion of Brazil have 54% of the

illiterate population of the country. Ceará has a population of 1.08 million of illiterates, the state's rate of illiteracy is 16.3% as of 2012 (3). The lack of education makes it much harder for farmers to get a job because their education is barely even basic! These farmers are only given the knowledge of their forefathers so they know how to farm and tend to the animals. This may simply be all the knowledge the farmers need if we can make sure they can survive with it.

The government has played more than its fair share of a role in Ceará's problem from healthcare to corruption. There is significant disparity in access to healthcare services in the Ceará. Due to extreme poverty, doctors don't want to work in facilities—such as the ones in rural Ceará, that are lacking appropriate technical support. Although the Brazilian government has programs with generous financial incentives to bring doctors to work in these areas, they still have very few doctors for the large population. Ceará people would have to go to the city of Fortaleza, the capital of the state for all levels of care. But it is many miles away! Almost all families don't have a car! How are they supposed to respond to illnesses without basic care? In Brazil, access to health care is universal, but despite this, there are major geographical disparities. Along with this major problem, this state of Brazil suffers from extreme corruption in this drought stricken region. As an example, the “Aquarium of the Latin America's” (6) was supposed to be completed July of last year. The foundations of this project haven't even been fully built yet. High government officials have stolen the funds of this ridiculous project. This project initially was supposed to cost around \$100 million, and they have already spent half of that money and they are not even a third of the way through. As well as local corruption in Brazil, there is also national corruption. There was a national project to end thirst and help families, but funding was “cut” from that also (7). All of this corruption has led the president of Brazil to have a 10% approval rating (8). Not exactly the feelings you want your citizens to have for you. Problems like this are part of why these farmers live on the brink of death. Nobody helps them.

Another one of the big problems with taking water from the rivers is that the river bring diseases, like intestinal worms. Some of the diseases in the dirty river water make kids have a harder time learning things because the water has damaged them by getting unhealthy concentrations of minerals picked up by the river. By giving families the ability to have the much safer rainwater, the families won't have to worry about water-related diseases and they can start living a better life.

Ceará has the 13th highest GDP in Brazil (9), but that doesn't mean anything for the rural population. Most of that money only circulates through Fortaleza, the state capital of Ceará. So with little money circulating through this region, the economy cannot grow and the farming cannot improve. The Real, Brazil's system currency has suffered from a lot of inflation. Egg prices have gone up 23%, soap has gone up 47%, and even some of the other simple things have gone up over 50%. Also, in Brazil's biggest city, Sao Paulo, there is a huge water crisis going on! New York Times described this as “The drought in Brazil is the worst in over a century” (10). If we take action against the cause now, while everybody is paying attention and feeling sympathy, the results could be better and soon we could see a more united cause against water scarcity.

The World Bank did a project in the Ceará region which was completed 5 years ago. It definitely improved the sub-urban life and water scarcity. The project built 8 reservoirs (11). Though this project is greatly appreciated, it was not nearly enough to keep up with water problems in rural Ceará because these people are still a ways away from the slightly more urban people and cannot reach the water fast enough.

Rivers in Ceará, unlike here, aren't very plentiful as you may have understood by now. The reason why the rivers are very low because Cearáns are using so much water from the rivers that rivers never replenished to their normal levels. Even when they get more rainfall, it happens so rarely in the year that the people can't save it even if they use all the buckets they have. They need the water daily and there is no way to reserve water except for small buckets—which they can't get enough of.

As one can imagine life in this area is not easy. Unlike people in the United States, rural Cearans are forced to go without water during long droughts-this has always been a problem in this area. Decreased water availability leads to reduced crop production, which leads to malnutrition and health problems such as a high infant mortality rate. Inflation has also affected Brazil heavily. If more local produce was available, the prices would be cheaper because markets wouldn't have to import as much as they used to. We need to focus our time and resources into saving this valuable and needed region in Brazil. This problem is more important to stop now than ever. If we do not do anything to help these poor farmers, soon there won't be any! Soon the locals will take their chances and try to move into the already overcrowded city of Fortaleza or Sao Paulo, where their lives won't improve with no education to support their resumes, if they can make one. Not many people have ever heard about Ceará, and frankly, nobody really ever has heard anything about rural Ceará. This is a great place to help. Helping these needy people will easily be worth the money.

My solution to this problem is to implement rainwater drainage systems that collect water that falls onto the roof that is tilted at a slant. The rain will quickly run down drains into a large 13,740 gallon (or 52,000 liter) cistern, just like a water tank (2) that can store all this rain water for an entire year. The people could save all of that water and use it during periods of drought. The costs for a cement-based cistern, using local labor, can be as low as \$1,500. Often, local families will participate in the labor bringing the costs down. If people listen and read carefully to reasons why they should support the project, I believe will understand why this is such a worthwhile investment. I mentioned to you earlier about the aquarium that was to be built and the corruption. Let's say that just 10% of that money is given to government officials (though that number is likely to be much higher)-just 10% of that money would be \$5 million. That would be more than 3,000 cisterns at the price above, which is plenty more than enough. Think about it-if we just took a bite out of the government's cake of corruption, we'd be able to help these people live a life they should be living. Simply \$15 from 100 people would be enough to make an awesome cistern!

By using these great cisterns, we can help farmers advance and yield more crops, have more food, sell leftovers (maybe for the first time) and be a bigger part of the Cearan economy. With this solution, the people of rural Ceará won't have to keep on drawing water from the almost dry river. The river will be able to grow dramatically and help the nature grow around it.

This will also help reduce poverty by lowering the amount of people living in a form of subsistence. Less people will live on or below the poverty line with more clean, fresh water. We take water for granted, but in Ceará, they dream they could take it for granted. But now, with much more water from the rainwater cisterns, their dream of living a sustainable life will finally become a reality!

The families will go through many changes in the following years and decades to come. Rural Ceará's population will dramatically change and go up because now, they can support a larger family and have more animals. Today, some farmers have to sell their animals before the animals die of thirst (2)!

Families could spend less time getting water miles away so more time could be spent getting a better education. As you see, the cisterns that could be planted will not only help humans, but all living things in the area. I also believe this project would serve as a great example and inspire others to do similar things.

The seventh Millennium Development Goal of the United Nations wants us humans to reduce biodiversity loss (12). By creating this water storage tanks, we'll be doing exactly that. The farmers won't have to keep getting water from the river since they have more water from the rain. By letting the thirsty river flow once again, nearby plants and animals can repopulate and wildlife can come back to the once completely dry region of Ceará. An important plant for farming in this area is carnauba-a plant only native to Ceará. Also, at the G7 summit, the leaders also set a goal to end world hunger by 2050. If we simply give the rural Cearans water, we will be solving their thirst and hunger problems because their

crops will be able to healthily grow once again! the eternal monster of the water scarcity problem in Ceara will be taken down by just a bit of generosity from anybody!

I was asked about the funding at the Iowa Youth Institute for this project. "Should these projects be solely funded by farmers?" My answer is- absolutely not. These farmers are unbelievably poor. This project should be funded through donations and fundraisers. But the community could help by learning about how biodiversity affects wildlife and how it is necessary and try to respect rivers. Along with that, usually locals help in the process of building these cisterns. The people living in Fortaleza could try to make their rural economy more connected to the urban economy and encourage more business. The government could also lend a hand in the process by encouraging projects like this one, but obviously they should not play a role in this project because it could easily suffer from corruption. Other things that could be done is spreading awareness of what life is like in places like rural Ceará, so then places like this are ignored less and people will help people in similar situations to this one.

We need to support and fund the water project for Ceará. This area is a vital part of Brazil in a great need of reliable clean water. Corruption, diseases, and many other things have struck down the people and crops leaving Ceará. We need to help the Cearans and their crops begin to flourish again. After all, farmers feed the world-why shouldn't you help the people who are doing this tough job? This cistern project will help Ceará maintain biodiversity, improve quality of life and life expectancy, and help the disappearing farmers come back and repopulate again!

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