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 Bolivia, Factor 2: Water Scarcity

Bolivia Water Scarcity

Water is a necessity. It feeds our crops to provide food for us. It makes up about 60% of the average human body. (The water in you 2017) It is available for some, and scarce for others. The country of Bolivia is located in western South America, close to the equator. It is the highest and most isolated country in South America, covering 424,164 square miles. It is also one of two landlocked countries in South America. Because of this, Bolivia has no access to the sea, which lessens importing and exporting opportunities. It also hurts their already weak economy. Bolivia's economy has been hurt by wars, exploitation, violence, and political instability, among others. These factors make Bolivia the poorest country in South America, with the per capita income being \$3,124, compared to the United States' \$54,629. Bolivians earn just less than 6% of what Americans earn per year. This places 45% of Bolivians below the poverty line. Although many people are not considered rich, Bolivia is rich in natural resources. Common exports include natural gas, minerals, and oil. Many people work as miners, extracting minerals like gold, silver, and tin. Agriculture employs about 32% of Bolivians, but it is challenging to grow crops because of many factors. (Bolivia 3 2017) Some common imports in Bolivia include pesticides, petroleum, cars, and construction vehicles. (Bolivia 2 2017) The climate in Bolivia depends on what region you are in. The three main regions in Bolivia are Altiplano, valleys and the lowlands, with the Altiplano being one of the most populated areas in the world. It is cold, windy and barren in this area. The Altiplano region has an average height of 12,000 feet, because it is in between the Andes Mountains. Another region, the valleys, has a hilly, rough terrain, making it nearly impossible to get to some areas. 40% of Bolivia's developed farmland is located in the Yungas - a part of the valleys region - and it has some of the best soil for farming. The weather in the lowlands is extremely dry for $\frac{3}{4}$ of the year, which makes it hard to farm. During the rainy season, the lowlands become swampy and it is not unusual to experience high temperatures. The lowlands cover about $\frac{2}{3}$ of Bolivia and contain part of the Amazon River basin. Although Bolivia is landlocked, it has many water sources, including Lake Titicaca, and the Mamoré and Beni Rivers. Despite the fact that it has numerous freshwater sources, water scarcity is a leading problem that impacts health, food security and quality of life. (Bolivia 3 2017)

The Bolivian water crisis has been out of control for decades. A typical urban family of 7 living in La Paz does not have enough clean water to go around. Many times citizens have to buy bottles of water to get clean, clear drinking water. In a 2001 national census, it was determined that 35% of houses had piped water indoors, 54% had outdoor piped water, and 11% did not have water at all. (Water scarcity, climate change and Bolivia: Planning for climate uncertainties) Sometimes, schools have to shut down because of the lack of water. (No Running Water – Drought in Bolivia 2017) Reservoirs in La Paz are only 1%, 8%, and 8% full, so President Evo Morales has declared a state of national emergency, and started rationing water. (Bolivia to build La Paz reservoir to ease drought 2017) Families must line up in back of a water truck for hours to fill trash bins and buckets with water. The government brings these trucks around to supply water to the people of Bolivia. Often, it is not clean, and there is not always enough for everyone. (Kaufman 2017) Marriage is common around 22-25 years old, and living with extended family is also normal in Bolivia. (Relationships, Marriage, & Family Life in Bolivia) Private schools are common, but many of them are religious, and people drop out. Public schools and hospitals do not have good equipment and tools. The good hospitals are far away, and there is a ratio of 1.2 doctors for every 1,000 Bolivians. (Health in Bolivia 2017) It is hard to get access to good healthcare, with little money. Jobs like construction workers, maids, housekeepers, electricians, and carpenters are common for lower class

people. Middle class people are doctors, lawyers, engineers and technicians of various types. (Bolivians 2017) A typical diet consists of meat or fish, usually chicken, with rice or potatoes. Families buy their food in open air markets and supermarkets, depending on what's open. The water crisis has affected Bolivians greatly. It is hard for them to get clean water to drink, bathe, and water plants. Many rural farm families had to move to the city because there was not enough water for their crops. It is hard to survive as a farmer; saving water with different farming practices will help Bolivians eradicate the water crisis. Water accessibility is constantly getting worse in Bolivia, and climate change is not helping.

In Bolivia, 24% of rural people do not have access to improved water. (Bolivia 2017) 24 out of every 100 rural Bolivians are water insecure – meaning they do not have sufficient access to enough clean water. (Bolivia 2017) Only 34% of rural Bolivians have access to improved sanitation. This means that 66% of rural Bolivians don't have access to a flush toilet, connection to a piped sewer system, or a latrine that is not shared. (Bolivia 2017) Without access to enough clean water, families cannot grow food. They have to move out of the country into the city, abandoning their barren farms and dry crops. Life is hard in the city, as well. Many Bolivians have to stay home from work to wait for the water in their house to turn on so they can fill their storage tanks. The government does not always give a specific date in which the water will turn back on. Missing work can result in unemployment and losing money, if you have to stay home from work, you're not earning anything. Sometimes, the water is streaked with brown. (Kaufman 2017) This water is not suitable for drinking, and bottled water needs to be purchased. Lower class Bolivians may not have enough money to purchase bottled water, even when it is sometimes a necessity. Another toll of clean water is infection. If a skin wound is not treated with clean water, there is an increased chance of infection. (First Aid & Emergencies How to Clean a Skin Wound 2017) Clean water removes dirt, bacteria, and debris, reducing the chance of infection. Over time, water insecurity has worsened. Global warming makes less rain/snowfall to rebuild glaciers. As glaciers disappear, more droughts and water shortages appear. Edson Ramirez, professor at the Institute of Hydraulics and Hydrology of the Higher University of San Andrés in La Paz measured the height of the Chacaltaya Glacier in 1998 and realized it was shrinking very fast; at 1 meter per year. He predicted that it would be completely gone in 2015. His calculations were wrong. The glacier disappeared in 2009, 6 years before his prediction. Over the past 15 years, annual rain and snowfall decreased by 20% in the Bolivian plateau, Altiplano. Local water officials say it will fall by at least another 10% by 2030. (Kaufman 2017)

There are many solutions that come to mind when thinking of water scarcity, such as a pipeline from Lake Titicaca to La Paz, building another reservoir, drip irrigation, and water recycling. But, many of these solutions are pipe dreams. Cost, environmental protection, resource management, and many other factors come into play when thinking about solutions. For example, a pipeline going from Lago Titicaca, a freshwater lake just west of La Paz, to La Paz would cost about \$2 million per mile to build. (Markowitz 2015) From Lake Titicaca, it is about 40 miles. That's \$80 million of water pipeline. But, this pipeline is a crucial solution to Bolivia's problems. As of January, 2017, Bolivian president Evo Morales has decided to put in a reservoir, the Kaluyo Reservoir, just outside of La Paz. The reservoir costs about \$42 million, and although it costs a lot, it will be worth it in the long run. (Bolivia to build La Paz reservoir to ease drought 2017) One solution to filling reservoirs is to pump water through the pipeline to the reservoirs, to fill them up and make them usable. Instead of routing the pipeline to La Paz, filling up one or two of Bolivia's reservoirs could help ease the water problem. Some barriers that the Bolivian government might face are money and taking water from Lake Titicaca. Because Bolivia's economy is in a bad position right now, it will be hard for President Morales to justify spending \$42 million on a reservoir, then spending even more money on a pipeline. Making an agreement with Peru to build the pipeline is also a challenge. Because Bolivia and Peru share Lake Titicaca, it will be hard to take water without consulting the Peruvian government first. By making an agreement, Bolivia could contribute to half the cost of the

pipeline, and Peru could pay for the other half. It would benefit Peru, as well, because they would also be able to supply water to their people. Even if Peruvian and Bolivian leaders agreed to put a pipeline in Lake Titicaca, it will take time, and relocate the indigenous people that live there. There have been conflicts in the past with indigenous groups in other parts of the world who don't want to relocate or don't want their land destroyed. Depleting the lake's water source may affect indigenous people's homes, causing yet another conflict in Bolivia.

Another possible solution is drip irrigation, a way for farmers, or home gardeners to water their plants efficiently while conserving water. The systems are inexpensive, and save 30-50% more water than other methods, such as sprinklers. (Irrigation Tutorials 2017) Because about 70% of water is used for agriculture, it is necessary to cut down on water usage, especially because there are many different ways to conserve water when farming, some of which are readily available, like drip irrigation. Drip irrigation systems water only where you want them to, cutting down the number of weeds in your crops and saving time, water, and money. Lastly, it helps control harmful fungus that occasionally occurs when the leaves of certain plants are wet. (Eartheasy 2017) Drip irrigation is a simple way to help Bolivia's economy, as well as their water crisis. Using drip irrigation methods for farming will save the farmers money, and also produce healthier crops. The farmers will not have to move out of the city, and more food will go around. But drip irrigation is a collective effort. Rules need to be put in place for this solution to work. There should be a limit to how much water farmers use on their crops. This limit will encourage more farmers to use drip irrigation, because it is an efficient and easy way to practice better farming techniques, as well as put farmers below the water limit.

Another solution is for the whole world to become aware of climate change and how it is affecting everyone around the world. Conserving fossil fuels by carpooling, taking the bus, and buying energy efficient machines are a few ways people all around the world can help. Reducing Climate change would not only help Bolivians, it would also help other countries around the world with similar problems. Reducing climate change will bring about change to the whole world, if we all agree to help. Climate change is not one country's problem, and it is not one country's solution, either. It is everybody's problem, although some don't see it. It is a group effort that everyone must work to fix, or else it will never be fixed. The first step is creating laws about pollution. Laws must be put into place about how much companies can pollute, and they should be held responsible for it. Mines in Bolivia must stop polluting Bolivia's rivers and lakes, which are already drying up due to climate change. Companies should not be polluting air, making the environment unsafe, and destroying the ozone layer. The reason the Chacaltaya glacier is melting, and lakes are drying up is because of climate change. World leaders need to step up and fight climate change together.

The citizens of Bolivia, especially those affected by the water crisis can reach out to large organizations like Pacific Institute and the World Water Council, asking for assistance with the problem happening all over Bolivia. The Pacific Institute helps with many issues, some of which relate to water. They research alternative farming practices, designed to use water efficiently and safely. They also work to develop new ways to manage and use water, making policy makers aware of the effect of climate change on water, and are currently trying to get people to think about water differently. They provide their contact information on their website, and people may contact them there, asking them to raise awareness about the specific problems in Bolivia, or asking how they can make a difference. They have a specific program and program director dedicated to fixing water scarcity, and researching solutions to water crises all over the world. The Pacific Institute also researches, spreads awareness, and develops solutions for climate change. They are working to bridge the connection between water scarcity and climate change, making

more people aware of it. If many people reached out to the Pacific Institute, they would realize how critical it is to fix this issue, and would hopefully step in and help. (Pacific Institute 2017) Another organization, the World Water Council, has established the Panel of Financing Water Infrastructure, built to avoid the water scarcity by 2025. They hold world water forums, with the eighth annual one being held in Brazil in 2018. At the seventh forum, held in South Korea, they discussed “Moving from Solutions to Implementation, Bridging the Platform of Science & Technology to Water Issues, and ensuring a significant place for water in the Sustainable Development Goals (SDGs)”, which were also discussed in the previous forum. At their forums, they have thousands of people come, including ministers, national government delegations, and heads of state, accounting to 40,000 people at the seventh forum. (World Water Council 2017) Emailing the World Water Council will be helpful, especially before the eighth annual forum, because getting leaders to talk about problems in Bolivia may encourage them to assist. If president Evo Morales were to attend the eighth annual forum, he may be able to tell his and other people's' stories, because he has power and influence. Brazil is adjacent to Bolivia, and flying out to the forum would not be a big deal. Contacting someone from the government would bring this forum to Morales's attention, prompting him to go. These big organizations are very capable of helping. All that needs to be done is for them to be alerted by people being affected by this huge problem.

Bringing this issue to the attention of other countries is another possibility. People could also reach out to newspapers or magazines like Smithsonian Magazine, or the New York Times to get media to cover the issue. In Popular Science's January/February 2017 issue, they made a unique magazine that covered water awareness, how to conserve, and the Bolivian water crisis. Newspapers and magazines are a big influence in today's society, and many people will be more aware of what they can do to help water scarcity in Bolivia. When people read things in the newspaper or online, they are inclined to share it, especially if it is popular. Making the Bolivian water crisis stand out and become a well-known topic will make people more inclined to help conserve water or donate their time or money to the Pacific Institute or the World Water Council.

In conclusion, one of the biggest problems facing families in Bolivia is water insecurity. Lack of water makes it hard for farmers to grow crops, and as a result they leave their farms in the hope of getting a better job in the city. The best solution to water insecurity will be a collective effort. Raising awareness to people everywhere, using better farming practices, and reducing climate change are all large parts of the solution. To raise awareness, sending emails, calling, and sending letters to influential organizations and people will bring crises like the Bolivian water crisis to their attention. Without the help of people like President Evo Morales, the Pacific Institute, and the World Water Council, people who are passionate about water may not ever get close to a solution. But it's not just leaders that need to step in and help. An ordinary citizen can help just by doing their part every day. Taking shorter showers, turning off the lights, and carpooling are simple, easy ways to help reduce climate change and conserve water. People need to understand the importance of water and how it should be used in today's society. World leaders need to meet and talk about this issue, so it is known around the globe. But before world leaders can talk about it, people need to become aware of it and prompt them to. It is important for the world to work together to solve these problems, even if they don't directly affect you. If these important problems get out of hand, they could end up affecting you, or becoming a global problem. The Bolivian water crisis isn't just affecting Bolivians. It affects countries surrounding Bolivia, like Peru, Paraguay, and Chile. If there is no water left for Bolivians, there will not be any water left for other countries. To collaborate, it is important that many people reach out to organizations and people with influence. Because many people are calling or emailing about the same thing, they will be more likely to do something about it. People other than Bolivians should be emailing and calling, conserving water, and donating. When people work together, they are stronger than they think.

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