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Bolivia, Factor 9: Water and Sanitation

### **Bolivia: A Future and a Hope**

The American dream is the idea that any US citizen should have an equal opportunity to reach success through hard work and determination. However, this is not the case in third world countries. Hard work and determination do not always lead to success in developing nations. Poverty, malnutrition, and unsafe drinking water are just three examples of the struggles that these nations face on a daily basis. Unfortunately, these struggles have become a part of daily life which creates an unstable lifestyle for all of the inhabitants living in these third world countries.

The mortality rate in Bolivia is 31 per 1000 live births, but even with this high mortality rate, the population is growing at a steady pace of 2.0%. Having a large family is very common within this country. Not only does a Bolivian family house a father, a mother, and their children, but it also houses aunts, uncles, cousins, and grandparents. This extended family provides an extended social-support system. It is very common for a couple in Bolivia to have six or seven children. These families heavily rely on the food they grow or the food the nearest market sells. Bolivian families typically eat potatoes, rice, milk products, fruits, soup, and chicken

A free to compulsory education is given to children ages five through eighteen. Compulsory means that it is required by law or it is a rule. Even though the education is available, the school conditions are very poor. Approximately less than one half of all children complete primary education, and less than one third go on to secondary school. Getting an education is a vital part of life, and without it, poverty is the most likely result.

In other countries, health care is the only way for some to receive the medical attention that they require. Only one half of the Bolivian population has access to medical care. When health care is not an option these Bolivian families don't have the money or resources to get medical attention. Hepatitis, cholera, chagas, and AIDS are growing threat, due to the lack of health care available.

33.5% of Bolivia's population lives in a rural area and three out four of these people are living in poverty. A family living the agronomic lifestyle grows about 37 acres of crops including potatoes, corn, rice and grains, vegetables, and fruits. Not only do they grow crops for personal use, but they also grow cash crops that include soybeans, coffee, sugar, cotton, and coca. In all of South America, Bolivia has the worst farming technology. This causes them to be more vulnerable to droughts and floods. Along with the lack of farming technology, Bolivian farmers also had to compete with contraband imports in a wide range of agricultural products. This can create a daily struggle for all of the agriculturalists living in Bolivia.

Imagine living in a country where roadways, cars, and buses were not common. This is such a scary thing to imagine, because so many people in the world heavily rely on these things. Bolivia is extensively lacking in roadways and transportation, and it has become a routine barrier that they are used to dealing with. Agriculturalists in Bolivia are unable to reach towns that have goods they may need. Due to this obstacle they must eat what they grow or raise. The lack of roadways and transportation can cause times when a Bolivian farmer is unable to make it to the market to sell their products. This can cause the product to spoil making it unsafe to eat. Families in Bolivia that aren't as fortunate to have farming land must go to the local market to obtain what they need. Unfortunately, the roads make it very difficult for these families to reach food and other products they may need. This can lead to malnutrition and eventually death for these families. When roadways, cars, and buses are not available for these families it

makes it very difficult for the working members of the family to reach work. Every day is a struggle for most every family in Bolivia.

It takes approximately 1,799 gallons of water to produce one pound of beef, 576 gallons for one pound of pork, 216 gallons for soybeans, and 108 gallons for corn. In Bolivia 72% of Bolivians don't have access to safe drinking water and 24% don't have sanitation coverage. If water is not safe for drinking it is most likely not safe to water crops with. Irrigating crops with dirty water can later lead to surface water pollution. Whenever a crop is irrigated with unsafe water it can cause the crop itself to become unsafe. When the crop is consumed, one can receive a much higher dose of contamination than one would have if he/she had been directly exposed to the original source of the contamination.

Salmonella are a group of bacteria that can cause food poisoning. This occurs when food or water contaminated with germs, poisons, or chemicals is eaten or drank. Food poisoning causes an infection in the gut called gastroenteritis. Salmonella can be passed from animals to humans if the meat is not adequately cooked. Drinking milk or eating uncooked eggs from an animal that has salmonella can also pass the infection to humans. Not only can meat become contaminated, but fruits and vegetables can become contaminated with salmonella through contact with manure used to help them grow. The typical treatment for salmonella is to drink plenty of fluids to avoid dehydration and antibiotics are needed in some salmonella cases. Due to the unsafe drinking water and the lack of health care, most people cannot afford to get the help they need which causes the disease to get worse.

Bolivian people lack access to both portable and clean water and they also have a lack of basic sanitation. Innumerable people are forced to drink contaminated water, and for all of these people, this is the only option they have. Most families rely on a contaminated creek or lake nearby to get water. Bolivia lacks technology to make this water drinkable. Unsafe drinking water and the absence of sanitation leads to various illnesses which makes the poverty numbers climb even higher. One health issue that derives from water and sanitation problems is diarrhea. Approximately 36% of deaths in children less than five years old in Bolivia are due to diarrhea.

Although though the conditions in Bolivia are still very bad they are improving. These problems have greatly improved since 1990 due to the increase in sectoral investment. Approximately 95% of Bolivians have reported having improved water and 36% have reported having improved sanitation. Rural farming families in Bolivia have higher quality meat, fruit, and vegetables because of the increased water and sanitation in the area. Irrigating crops and animals is now easier with safe water.

Resolving Bolivia's water and sanitation issue could increase the amount and quality of food. With clean water and increased sanitation they could increase food production and decrease the poverty level. Unsafe drinking water is the leading cause of the growing poverty levels in Bolivia. Smallholder farmers would considerably benefit from resolving these problems. They could then effectively irrigate more crops and animals than they ever have before. This could provide families in Bolivia with more food to feed their families with. Not only would safe drinking water help farmers, but it would also improve the health of Bolivia, generate economic benefits, improve life at all ages, and respecting human values. Improving the water sanitation would improve all of these factors eventually lowering poverty levels.

Sanitary drinking water is crucial part of human life, especially among children. Improving the water and sanitation issues would cause people to live longer, thus giving them improved health and a better chance for a better life. This would eventually lead to lower poverty levels and improved health in Bolivians.

Economic benefits are just another incentive to improve the water and sanitation issues in Bolivia. The availability of water can be used to start or expand small enterprises leading to an increase of disposable household income. As the demand for agricultural products increases there will need to be more farmers

selling their products for exports. This could help Bolivia generate trading with other countries which could eventually lead to tourism.

Children ages zero to four would have a lower mortality rate. From ages five to fourteen, especially girls, if they had adequate drinking water and sanitation facilities. If parents didn't have to watch their children all day they would be able to get more work done. Ages fifteen to fifty nine, productivity gains would be achieved with improved water and sanitation facilities and people over sixty would be expected to live longer. Improving water and sanitation would improve the life of every age, which would eventually help lead Bolivia out of poverty.

Dignity, equity, compassion and solidarity are values that are shared by everyone in the world. . Extending water supply and sanitation services to poor households would largely contribute to promoting them. Expanding access to water and sanitation is a moral and ethical value that is based in every cultural and religious community in the world. Showing respect to other people in the world would give the people suffering from water and sanitation issues a little bit of pride and dignity. This could lead to Bolivians wanting to take a stand and helping Bolivia improve the water and sanitation issues to reduce poverty levels.

As countries start to advance and become more urban, there is potential for industries to be built. Factories and advances in technology always have a drawback: pollution. Manufacturing plants pour noxious byproducts into water which creates unsafe water. Pollution can also be caused by people dumping waste into waterways such as rivers and lakes. Polluted water is unsafe for drinking, bathing, and irrigating crops and animals. A growing population and an advancing society in Bolivia can lead to problems with their already present water and sanitation issues. Although the industries may pollute the air and waterways, they also provide jobs for the local communities in Bolivia. With jobs available there is a potential for the Bolivian population to make more money than ever before. This would give Bolivia a chance to be led out of poverty.

Even though water and sanitation issues in Bolivia are very poor, there are ways that a family in Bolivia can purify the contaminated water to make it sustainable to drink and bathe in. Boiling water, purification tablets, a PureMadi filter, and a rain barrel are just four of many ways to create clean and safe drinking water. Although these may be temporary solutions to a lasting issue, they can provide families with safe drinking water. Drinkable and safe drinking water is very difficult to come by in Bolivia, so anything that can help them purify or obtain safe water is helpful for these families.

Boiling contaminated water is a very common practice for developing countries. To do this, one would need a pot or a fireproof container and a stove or fire. The contaminated water goes into the pot or fireproof container and then set over a fire or stove. If a stove is being used then he/she should use a pot and if a fire is being used then he /she should use a fireproof container. Bubbles are a sign that the water is boiling, but it must stay in the pot until it comes to a heavy boil. Once the water reaches this point it only takes 5-10 minutes to purify the water. Once the boiling process is over, the water needs to sit and cool. This will cause the dense items in the water to sink to the bottom, leaving the purified, safe drinking water at the top. Boiling contaminated water cause all of the bacteria living in the water to be killed providing sufficient drinking water for families in Bolivia.

Purification tablets are another way of purifying water. Iodine and chlorine tablets are the two main types of purification tablets. The contaminated water first needs to be strained with a cloth or some type of strainer. The strained water needs to be put into a bottle or container. From there, a purification tablet can be dropped into the water. The tablet needs to be completely dissolved and in the water for at least 30 minutes before the water can be drinkable. Although Bolivia does not currently have access to these tablets, they can be shipped in from other countries to help the development of Bolivia's water and sanitation issues. Aquatabs Water Purification Tablets are manufactured and produced in developing

countries. One tablet can purify 5 gallons or 25 litres of water. PureMadi is a non-profit University of Virginia organization and they have invented a ceramic water purification tablet called MadiDrop. This tablet was developed and extensively tested at the University of Virginia. The tablet is impregnated with silver or copper nanoparticles and it can repeatedly disinfect water for up to six months simply by resting in a vessel where water is poured. Not only does this tablet making the water safe to drink, it also is very beneficial to people with compromised immune systems, such as people living with AIDS.

PureMadi also produces a filter. The filters are made of local clay, sawdust and water. Those materials are mixed and pressed into a mold. The result is a flowerpot-shaped filter, which is then fired in a kiln. The firing burns off the sawdust, leaving a ceramic with very fine pores. The filter is then painted with a thin solution of silver or copper nanoparticles that serve as a highly effective disinfectant for waterborne pathogens, the type of which can cause severe diarrhea, vomiting and dehydration. The design of the filter allows the person using it to pour contaminated water into the pot and then allow it to filter through. The pots flow rate is one to two litres of water per hour.

A rain barrel can be used to collect rain water off of a roof. They divert and collect rain water that would otherwise flow off of the roof into the ground. A barrel or some type of container needs to be set at the corner of a roof. Once a heavy rain comes the water will flow off of the house into the barrel or container. This practice is called rain harvesting. A system like this can yield 2358 litres of water for every 2.4 centimeters of rain. This can provide a Bolivian family with enough water to help them survive until the next rainfall. Not only is water that is caught in the rain barrel good for drinking, it is also good for watering gardens, agriculture, and showers. If the Bolivia population started using this method they would need to make sure that their roofs are not painted with lead-based paint. When the water runs off of the roof into the barrel the lead-based paint could chip off and settle in the water barrel causing many health issues.

People in Bolivia believe in the decentralization of government and believe that the communities should decide where the local government should furnish their money. A water system is seen to be communal, but sanitation is seen as a personal choice. This means that there are no finances available to fund sanitation issues in Bolivia. Water for People-Bolivia is a local project that is trying to address these issues the best way possible. Their mission statement is “Water for People exists for one purpose, and it’s as simple as our name: we want all people to have safe, continuous water, and when they do, our job will be done. We want water for everyone, forever”. With more help from the local governments in Bolivia, this project could be scaled up which will provide people with more knowledge about the water and sanitation problems that are present in the country that they are living in. Outside help from other countries could also help the spread of knowledge within Bolivia.

If one person would step up in each community and provide the other members of the community with knowledge about the unsafe water that they are drinking and irrigating their crop with they could educate the entire country about their growing problem. Once someone sees someone else doing something, they tend to want to do the same thing. Once one person uses techniques and other ways to provide clean and sanitary water for their family everyone else will follow. This could provide every community in Bolivia with the safe water that they desperately need to survive.

Organizations cannot be the only ones that spread the knowledge about this growing problem in Bolivia. National and community leaders can also spread the word about the growing issue. If Bolivia wants this problem to be resolved, they must want to be helped and they must also want to help. You cannot help someone who does not want to be helped.

“Development is about transforming the lives of people, not just transforming economies.” This famous quote by Joseph E. Stiglitz is a perfect example of how we need to help make a change for the communities of Bolivia, not just change their economy. When I look at Bolivia, I see not only hope for

the people that inhabit it, but I also see a future for the country itself. Even with terrible water and sanitation problems present today, they are slowly reaching improvement. Even in the condition that Bolivia is in the people can still take action and try to improve these issues for their families. With other countries leading the way, Bolivia will eventually be led out of poverty and in to a life of clean and stress free living. Love needs to be shown to these countries through support and help. There is a bright future awaiting Bolivia and it will be shown to them one day.

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