

Spencer Williams
Vinton-Shellsburg High School
Vinton, Iowa, U.S.A.
Bolivia, Malnutrition

Defending Food Security in Bolivia: Malnutrition

Many third world countries have issues that create food insecurity, such as little arable land, a lack of clean available water and a need for nutritional food. As well as one very common issue throughout the globe: overpopulation (Canadian Red Cross). Overpopulation leads to many problems and Bolivia is no exception. While overpopulation is an issue, the population of Bolivia will likely begin to level out within the next decade when considering demographic transition. A process other countries like Bangladesh, Pakistan, and others have already experienced. Demographic transition can be seen where there is a boom in population caused by fatality rates of infants/children decreasing, thanks to modern medicine. While families are still used to having many children. Causing population to skyrocket. The process ends when the population averages out from individuals adapting to the situation. Thankfully Bolivian families are already tending to have under half the previous average number of children. 20 years ago Bolivian families had around 6-8 kids; now it is only 3 or 4 (TRADING ECONOMICS). So rather than focusing efforts on overpopulation, it would be more beneficial to build upon increasing sustainable food sources. Seeing as how most Bolivian citizens greatly suffer from malnutrition currently. According to Medical News Today; malnutrition is an ailment produced from the lack of nutritional food since there's simply not enough nutritional food or clean drinking water to go around. Many farmers and agriculturalists in the country are not farming in the most efficient of ways. They haven't been taught how to utilize Genetically Modified Organisms, proper crop rotation, fertilizers, or cover crops. They are also a very poor country, meaning that technology and precision agriculture strategies commonly used in countries like the United States, are out of reach for Bolivian agriculturalists. The daunting issue of malnutrition affects more citizens of Bolivia than what meets the eye. Malnutrition is seen in all age groups, though there are higher rates of malnutrition in groups such as the elderly and children whose diets have more specific demands (World Food Programme). Thankfully there are solutions to an ailment like malnutrition, starting with fixing the root of it all. Projects like helping to fix the lack of nutritional food or clean water would dramatically increase the nutritional intake of Bolivians. If the projects presented live up to their highest potential, it will greatly reduce the rates of malnutrition within the country, as well as combat potential future issues rooted back to food and water insecurity.

Bolivia is located in West-Central South America. Reaching about 950 miles from the North to South, and roughly 800 miles East to West. Over 425,000 square miles in total; just smaller than the U.S. state of Texas. Bolivia is a land locked country as they are bordered to the North and East by Brazil, to the Southeast by Paraguay, to the South by Argentina, to the Southwest and West by Chile, and to the Northwest by Peru. The geography consists of rugged terrain, with the highest point at 6,542 meters, and the lowest being 90 meters above sea level(worldatlas.com). The climate ranges from humid and tropical, and cold to semiarid (iexplore: Bolivia-weather). Bolivia's primary imports are pesticides, vehicles/machinery, and raw materials such as iron; their main exports consist of soybeans, maize, grain, sugar cane, and petroleum gas. (The Observatory of Economic Complexity). Relatively 34.83% of the land in Bolivia is cultivated (TRADING ECONOMICS). On average, a farm ranges from 2-8 acres, which is much smaller than a typical farm in the United States, which averages 444 acres (Netherlands Enterprise Agency | June 2017-Fact-finding Agro-Food Bolivia), since many families farm for themselves to make food more accessible and affordable. An average family will not possess the land, technology, technique, or knowledge compared to big commercial farms, inhibiting them from discovering large profit margins. With having little farmland, and a very high need for food as a result of malnutrition and poor farming practices, a big obstacle can be finding new and more efficient ways of farming that will help improve practices. The

population of Bolivia is roughly 11.67 million (Point2Homes: Bolivia demographics), and the government consists of a presidential system similar to the Americas (The Borgen Project Hunger in Bolivia). Many things put a hindrance on providing nutritional food, such as irregular weather like droughts, floods, and other natural disasters (World Food Programme). Natural disasters can be very damaging to agriculture, as well as to landscapes. Both of which significantly slow down progress towards possible solutions. A solution which shall be presented in the following paragraphs, is the construction of rainwater collection systems. These systems are very cost effective, and resilient. It would take many years, up to decades for ponds and infiltration basins to wash away, or even lose any significant depth. However, damage to farmland can be irreversible. If a country such as Bolivia who is already struggling greatly with food insecurity, lost even a quarter of its total harvest. Many would suffer. Not only the farmers who would lose out on profit. But there would be significant rates of mortality. Natural disasters are a large reason why Bolivia hasn't been able to break away from its food issues.

When it comes to food insecurity, it's important to look into the lives of Bolivians to better understand the individuals, and who we would be affecting. An average family in Bolivia consists of 3 to 4 people. The common diet of a family mainly contains corn, rice, potatoes, quinoa, beans, and wheat (Britannica/Bolivia: The Editors of Encyclopedia Britannica). People in Bolivia get most of their food from farming on their own, or from other locals. Largely because roads are not common in Bolivia's infrastructure, nor are adequate transportation methods. Bolivia is a very poor country. On average a citizen's annual income is under twenty-six thousand United States Dollars (USD), meaning that the luxuries are limited to the average consumer, and as far as producers, they are interested in low input costs within their operations. Bolivian Boliviano (B.O.B.) is the currency of Bolivia. The currency system is set up very similarly to that of the United States's, with 1 B.O.B. being equal to 0.15 U.S.D (Ceicdata: Bolivia Household Survey). Bolivia does have a proper education system in place, in which children between ages 6-13 can receive schooling for free. They have an 8-2-2 education system; a common education system in many third world countries, though most children do not move on to primary school because they work on their family's farm or must support their family in another way in order to make a living (Britannica/Bolivia: The Editors of Encyclopedia Britannica). There is a large struggle to get access to clean water, toilets, electricity, roads, etc. to much of Bolivia which creates a vast amount of additional issues into their daily lives (Borgen Magazine- Karin Filipova). All these aspects together cause Bolivians to miss out on the best opportunities for themselves and their country.

Malnutrition is an illness caused by a lack of proper nutrition which can stem from not having enough to eat, not eating enough of the right things, or not having the access to proper nutritional food (Medical News Today Medically). It is important to evaluate such a situation, in order to create potential solutions. Malnutrition is a major public health concern to Bolivia. While the stunting rate for children under 5 has dropped from 33% to 16% country-wide in ten years, in rural areas it remains as high as 23.7% (The Borgen Project: Hunger in Bolivia). Malnutrition rates are increased for the lower class as accessibility decreases with financial resources. Refugees, who face even more barriers with access to resources, make up the majority of the lower class (Canadian Red Cross). Since there are decently high rates of population density and a lack of nutritional food, most Bolivian citizens don't have access to enough food (World Food Programme). Another thing that contributes to the trend of malnutrition in Bolivia, is having inadequate knowledge of agriculture. Many farmers do their best to combat the country's problems by growing crops that have a combination of higher yield, are good/easy to grow in Bolivia's climate, and have more nutrition, however with the limited selection of crops that suit these needs, they repetitively grow a few crops. As a result, they find themselves losing out in other ways. Farmers mainly grow these few higher-yield crops so repetitively, year after year which has created poor quality soil that is extremely stripped of its nutrients in addition to introducing lower yields over time and less resistance to pests and disease. The lack of crop rotation, and overgrazing has also produced soil erosion, depletion, and

infertility. Bolivia had little depth prior to the presented issues both in its highlands and lowlands (Bolivia - Arable land). Above all poor soil quality is an obstacle, but is most definitely reversible.

One potential simple solution would be to arrange a food drive to bring nutritional foods to Bolivians. Unfortunately, this would be a shorter-term fix being compared to other possible solutions. An obstacle to keep in mind with running a food drive, would be shipping of the donations collected from the collection country to receiving. Nevertheless, this would provide valuable resources of which Bolivia is in great need of. A food drive would do very well, seeing as how many successful food drives there are put together in the United States every year. In the Feeding America corporation alone there are over 200 food banks to support high demand areas, as well as over 60,000 food pantries, where meals are distributed. The project would be led by individuals with experience in such a project. Like members from the World Food Programme. The World Food Programme is an organization that participates in very similar projects globally. The World Food Programme is a branch of the United Nations, which is focused on food assistance. WFP helps over 80 million individuals every year, and on average assists 83 different countries (World Food Programme). They've mainly delivered food and supplies in past projects. A possible base of operations would be a food pantry that is already run by the WFP or a rented space to collect, store, and ship out donations. Food For The Hungry is another cooperation that has assisted with food aid. FH has previously helped 115 communities in Bolivia already. They've reached 12,491 children in Bolivia, and have 9 church partnerships in place. FH would be a great help in this project. This cooperation could act as an extra hand to specifically help distribute the collected donations (Food for the Hungry). A food drive would greatly help to spread awareness over malnutrition within the country as well as in the U.S. Seeing as how this would get more individuals involved and talking about the issue. In addition the group running this project will be able to use social media, magazines, and newsletters to spread awareness. In the future, the team and corporations involved could hold more food drives following to ensure a consistent restock of supply, of course, depending upon the amount of success with the first. The WFP (World Food Programme) also has government funding to support their efforts. A possible next step after all of this would be building a food pantry that specializes in globally shipping out collected donations which could be a permanent space for many countries in need to share and utilize. The biggest hurdle in this solution would be putting together a team to build and run such a project, however, these future steps will help this project to become a more prosperous long-term solution. In addition a food drive can help to start minimizing the amount of food waste there is in the U.S. Although this isn't a permanent fix, it is a great start. Food aid will give the people of Bolivia a grace period to help focus on fixing other issues within local communities that will sustain longer-term solutions, issues that big organizations like the WFP cannot necessarily always fix. This project all in all will significantly reduce the amount of malnutrition Bolivia is currently experiencing.

Citizens of Bolivia struggle with getting enough clean drinking water which further contributes to problems regarding malnutrition in the country. In 2009, Bolivia began work on providing clean water to all of its citizens after the Bolivian Constitution declared access to clean drinking water a human right (Borgen Magazine- Karin Filipova). This alteration to the constitution shows that water scarcity is a prevalent issue in Bolivia. A policy that the United States has, which Bolivia could explore and possibly implement is The Safe Drinking Water Act (SDWA). This ensures the quality of safe drinking water for citizens which would help greatly in support of this project to help aid with the lack of clean water (United States Environmental Protection Agency). Separate from these policies, the primary project to help provide clean drinking water consists of building rainwater collection facilities. These would consist of ponds and infiltration basins in the lowlands. The systems will be able collect mass amounts of rainwater (Water Education Foundation). Then individuals have the ability to filter and distribute the water to those who need it. An obstacle in the way of this solution would be available resources. This project requires multiple front loading excavators to dig out land and create an area for the ponds and

basins, as well as dump trucks to haul away dirt. This machinery will likely have to already be in place in Bolivia. Arguably the biggest obstacles in building the rainwater collection systems is devising a crew in the area with this machinery and education in the field of landscaping/construction so it can be completed as envisioned. Transporting the team members to Bolivia and mapping out places to build the facilities is another aspect to look into. Members of the team that will be undertaking this task who aren't acquainted with the area will have to adapt to the geography and landscape, seeing as the majority running this project will likely be from the United States. Though this is a very difficult task, it has potential to greatly help for the long-term. Language barriers, misaligned expectations, and a lack of support are other potential barriers that would keep this solution from being effective if not considered in the planning process. Since Bolivia is quite a wet country receiving around 40-70 inches of rainfall annually (Current Results Publishing Ltd.). Comparable to the United States receiving 25-45 inches annually. This solution should be especially successful, seeing as how it takes advantage of the natural environment conditions. This solution also does not seriously alter nor damage the environment, compared to other water scarcity solutions such as building wells. This project is much more cost effective, as well as sustainable than other options. Many of the existing wells have been over-pumped in Bolivia causing accelerated corrosion and degradation of wells. Apart from build up of natural sediments, this project truly is a great option for self-sustainability for Bolivians. Building rainwater collection systems will directly provide citizens with the needed resource of clean, and safe water. This solution will increase the sustainability of water security in Bolivia, and even allow the potential for farmers to explore irrigation options for their crops as needed. The goal of this project is to lend Bolivia a helping hand, so that they can help themselves. With water insecurity being one less thing to worry about, Bolivia can focus efforts on other projects to combat malnutrition. By being fully self-sustainable, Bolivians are truly set up to prosper.

Similar to the prior solution, another possible project that could be implemented would be to devise a team of educated agriculturalists to travel to Bolivia and teach the local farmers more effective and efficient ways of farming. Low education farming is a large effect from children not following through with schooling. Unfinished school as early childhood education typically does not address sustainable farming practices. This could be done through the team teaching better ways of irrigation, introducing new crops that fit needs, and more importantly showing farmers the value of crop rotation. Crop rotation would significantly help seeing as the soil is very stripped of its nutrients and vitamins which was caused by excessive repetition of growing the same crops year after year. Introducing this technique will allow yields to improve again in addition to providing a well-rounded harvest for the country. Bolivia will have one of the best possible opportunities it needs to move forward if they are able to use 21st Century farming techniques. To re-emphasize; this solution best helps to set Bolivia up for the long run. There have not been many similar projects in the past, however, like the world has seen before introducing GMOs and proper farming practices can really make a difference for the better. This project is similar to Dr. Norman Borlaug's efforts to fight famines in struggling countries, and as many know, his efforts were extremely prosperous and effective. Although, with any solution that would involve traveling, there must be a few things kept in mind. That being possible laws and regulations which might not allow us to proceed as planned. The team will have to be ready and open to make alterations to the plan, to stay in compliance with any regulations that may be different from which they may be familiar. The members sent would also have to be equipped with the knowledge of traditional behavior and customs, as well as knowing the language or having a translator so they can maintain positive relations. The World Food Programme would also be a great asset in this solution, with members who have participated in other similar global projects. These individuals would help greatly with establishing connections to tangible and financial resources. Members from the WFP are already acclimated to adapting to different projects, cultures, and environments as well, creating a lower demand for additional training and education. A reverse farm trade could also be quite beneficial. In this the Bolivian farmers can visit America, and see how the technology, GMOs and farming practices that will be implemented have helped so much in countries like the United States. This project would take a while to execute and set up seeing as how it

would likely be hard to get a complete team put together. Although time spendy, this project would make Bolivia much more self-sustainable. It'll also provide more and in some cases, higher quality nutritious food, while increasing the variety. Keeping in mind how many Bolivian citizens are in the agriculture field; making farming more efficient, will help those farmers to save and earn more money which will be a direct investment to farming families.

With all of these solutions and projects, a huge burden across the board is funding. For many years the United States Department of Agriculture (USDA) has offered many competitive grants for similar projects, with a large variety to apply for (National Institute of Food and Agriculture: USDA). The USAID announced December 7, 2021 that the United States had made an investment of 11 billion dollars, pledged towards global food insecurity relief. Specifically towards malnutrition, and to safeguard the lives of women and children. The investment is intended to be spread across many countries and projects, and will be distributed across the next three years. Cooperation of Bolivian farmers and citizens is a must, an important factor to consider to make sure a cooperative relationship can be maintained. There may be some new technology introduced to the farmers, which they'll need to be taught how to use and operate. Overall, there shouldn't be too much change to everyday life for citizens, apart from new crops, and different water set ups. To encourage the adaptation of the solutions, there can be open meetings held to help share plans and reasons behind the efforts. In these meetings, members can discuss progress and a course of action. By having meetings open for anyone to sit in, citizens can learn what is being done and be involved in creating change as well. These solutions could effectively help to decrease rates of malnutrition within Bolivia, and also prevent future issues caused by food insecurity. These solutions could work in many other countries struggling with similar problems as well. Food security issues are caused by things like lack of arable land, a lack of clean available water, available food, and overpopulation. These solutions will effectively decrease malnutrition and water scarcity in Bolivia, all in a sustainable and educational way.

References

(n.d.). Retrieved from

<https://www.epa.gov/regulatory-information-topic/regulatory-and-guidance-information-topic-water#:~:text=The Safe Drinking Water Act,the Safe Drinking Water Act.>

Administrator Power Announces \$11 Billion to Combat Malnutrition and Safeguard the Lives of Women and Children: Press Release. (2021, December 07). Retrieved from

<https://www.usaid.gov/news-information/press-releases/dec-7-2021-administrator-power-announces-11-billion-combat-malnutrition#:~:text=At the 2021 Nutrition for,half of childhood deaths globally.b>

Average Annual Precipitation by State. (n.d.). Retrieved from

<https://www.currentresults.com/Weather/US/average-annual-state-precipitation.php#:~:text=For the entire United States,NOAA National Climatic Data Center.>

Bolivia. (2019, March 05). Retrieved from <https://www.fh.org/our-work/countries/bolivia/>

Bolivia (Plurinational State of): World Food Programme. (n.d.). Retrieved from

<https://www.wfp.org/countries/bolivia-plurinational-state>

Bolivia - Agricultural Land (% Of Land Area)2022 Data 2023 Forecast 1961-2018 Historical. (n.d.).

Retrieved from

[https://tradingeconomics.com/bolivia/agricultural-land-percent-of-land-area-wb-data.html#:~:text=Agricultural land \(% of land area\) in Bolivia was reported,compiled from officially recognized sources.](https://tradingeconomics.com/bolivia/agricultural-land-percent-of-land-area-wb-data.html#:~:text=Agricultural land (% of land area) in Bolivia was reported,compiled from officially recognized sources.)

Bolivia - Agriculture. (n.d.). Retrieved from

<https://www.nationsencyclopedia.com/economies/Americas/Bolivia-AGRICULTURE.html>

Bolivia - Arable land. (n.d.). Retrieved from <https://www.indexmundi.com/facts/bolivia/arable-land>

Bolivia - Canadian Red Cross. (n.d.). Retrieved from

<https://www.redcross.ca/how-we-help/international-programs/international-development/americas/bolivia>

Bolivia - Weather. (n.d.). Retrieved from

[https://www.iexplore.com/articles/travel-guides/central-and-south-america/bolivia/weather#:~:text=It ranges from humid and,is mostly cold and dry.](https://www.iexplore.com/articles/travel-guides/central-and-south-america/bolivia/weather#:~:text=It+ranges+from+humid+and,is+mostly+cold+and+dry.)

Bolivia Average Monthly Nominal Salary. (n.d.). Retrieved from

<https://www.ceicdata.com/en/bolivia/household-survey-average-monthly-nominal-salary/average-monthly-nominal-salary>

Bolivia Demographics. (n.d.). Retrieved from

[https://www.point2homes.com/US/Neighborhood/NC/Bolivia-Demographics.html#:~:text=The average annual household income,sits at \\$45,625 per year.](https://www.point2homes.com/US/Neighborhood/NC/Bolivia-Demographics.html#:~:text=The+average+annual+household+income,sits+at+$45,625+per+year.)

Bolivia Population2022 Data - 2023 Forecast - 1960-2021 Historical - Chart - News. (n.d.). Retrieved

from [https://tradingeconomics.com/bolivia/population#:~:text=Population in Bolivia is expected,according to our econometric models.](https://tradingeconomics.com/bolivia/population#:~:text=Population+in+Bolivia+is+expected,according+to+our+econometric+models.)

Climate of Bolivia. (n.d.). Retrieved from <https://www.britannica.com/place/Bolivia/Climate>

Education, health, and welfare. (n.d.). Retrieved from

<https://www.britannica.com/place/Bolivia/Education-health-and-welfare>

Finding Ways to Change Eating Habits in Bolivia. (n.d.). Retrieved from

<https://www.iadb.org/en/news/webstories/2013-03-04/bolivia-fights-malnutrition,10320.html>

Groundwater Replenishment. (n.d.). Retrieved from

<https://www.watereducation.org/aquapedia-background/groundwater-replenishment>

History. (2022, April 02). Retrieved from <https://thp.org/who-we-are/history/>

Malnutrition: Symptoms, causes, diagnosis, and treatment. (n.d.). Retrieved from

<https://www.medicalnewstoday.com/articles/179316>

Misachi, J. (2021, February 13). Landlocked Countries In South America. Retrieved from

[https://www.worldatlas.com/articles/how-many-countries-in-south-america-are-landlocked.html#:~:text=Bolivia, at 1,083,300 km2,Initially, Bolivia was not landlocked.](https://www.worldatlas.com/articles/how-many-countries-in-south-america-are-landlocked.html#:~:text=Bolivia,+at+1,083,300+km2,Initially,+Bolivia+was+not+landlocked.)

Project, B. (2019, December 17). Top 10 Facts About Hunger in Bolivia. Retrieved from

<https://borgenproject.org/top-10-facts-about-hunger-in-bolivia/#:~:text=Bolivia has the highest level,too short for their ages.>

Reports, S. (2020, November 15). Citizens Seek Access to Clean Water in Bolivia . Retrieved from

<https://www.borgenmagazine.com/clean-water-in-bolivia/>

| National Institute of Food and Agriculture. (n.d.). Retrieved from

<https://www.nifa.usda.gov/grants/funding-opportunities>