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Chad, Factor 9: Water & Sanitation

Chad: Struggling Nation Would Benefit From Clean, Potable Water Supply

How often have you been thirsty and gone to the sink in your home and filled a glass full of water from the tap? How often have you stopped at a convenience store and purchased a bottle of water? How often have you worried if the water from either of these sources was clean and safe? Fortunately, many of us have never had to worry about whether the water we consume is clean and safe. Sadly, there are 783 million people on earth who do not have access to clean water and 2.5 billion who do not have adequate sanitation services (Facts and Figures). An insufficient supply of clean water or sanitation methods are a harsh reality for the people of Chad in central Africa. In 2012 there was a cholera outbreak in Chad that was directly related to contaminated water. Over 17,000 people were infected and nearly 500 died from the disease (Hubbard). Since that time organizations such as UNICEF and USAID have made tremendous strides in constructing solar powered to serve many villages and towns in Chad. However, nearly 50% of the population of Chad is still without safe, sanitary drinking water (Hubbard). Saran Kaba Jones was once quoted as saying "Water is life" (Soetan). This rings particularly true in a nation like Chad who has so many basic survival challenges to overcome. Chad is a largely agricultural nation and their dependence on clean, fresh water runs much deeper than just supplying the citizens with drinking water. The safe production/growth of food crops, the care of livestock, the safe preparation of food, the need to bathe in clean water and the ability to provide adequate and sanitary medical treatment are all dependent on villages having access to clean water. Chad is one of the most poverty-stricken nations in Africa. It will no doubt take a lot of time and continued effort on behalf of world aide organizations, along with the government and citizens of Chad, to make the necessary economic and infrastructural changes needed to supply the entire country of Chad with clean, sanitary water. By continuing to supply the people of Chad with water sanitation techniques and devices we can help combat many of the nation's problems that are linked directly back to a lack of clean, safe water (Culture of Chad).

An average family in Chad is quite large. Men commonly have more than one wife and typically have multiple children with each wife. These are large extended families, where the wives and children of two or three brothers will often live together, along with other close relatives. About two-thirds of Chadian girls are married before they are 18 years old, and about one-third are married before 15 years of age. This has caused a health concern in and of itself, as it has been shown that girls who begin bearing children before their bodies reach a certain physical maturity can contribute to certain illnesses, nutritional deficiencies and even maternal mortality (SOS Children).

In Chad, families live in houses constructed of mud bricks and thatched roofs. It is becoming more common for houses and other buildings to be erected from more modern and sturdy materials. Chadians living in rural areas in the south lead very traditional lives farming the land and raising livestock. In the north, many communities are nomadic. It is much drier in the north and farmers must move from place to place frequently in order to find grazing land for their livestock (SOS Children).

The diet of Chadian citizens varies by region. The northern region of Chad is a very dry desert-like climate where nomadic tribes raise goats and cattle for dairy products. In this region people consume dairy products like yogurts and creams along with a dish known as esh. Esh is a cooked millet flour that is like a grainy custard and it is served with a sauce made from vegetables and/or dried fish known as moulah. The southern region is damper and more crops are grown successfully. People of the southern portion of Chad make a dish similar to esh, but it is made from a large variety of ingredients and is called boule. Boule can be made from millet, sorghum, maize, peanuts or cassava and is also served with a

sauce made from vegetables, beans, fish and meat. The citizens in the south also grow potatoes, rice and sesame allowing for more dietary variety (Culture of Chad). Throughout Chad the most common meat consumed is goat. When beef is used, it is chopped and made into a tomato sauce dish known as nashif. Meat is much more expensive than produce and is often dried and preserved for later use. Since their diets are based largely on fruits, vegetables and grains, almost all food preparation is dependent on the availability of clean water. For example, esh and boule are both dishes that contain quite a bit of water (SOS Children).

The northern third of Chad is known as the Saharan zone. In this part of the country crops like dates, beans and fruits can be grown in oases that occur randomly in the north. The oases are also known as 'wadis'. In these oases or wadis, water from underground is used to supply trees and some crops with irrigation. Also in the north, east and central arid and semi-arid regions, farmers have herds of grazing livestock (Hitton). Cattle are the most coveted animals, but in the driest parts nomadic farm groups will raise animals such as goats and camels because they are hardier and can withstand the drought conditions better than cattle. Very simple farming methods are used. Most work is done by hand and cattle are used for tilling soil. Mechanical equipment is rarely used as most farmers cannot afford to own and or maintain it. In the southern region where the farmland is more fertile there is a lot of competition for land between farmers and cattle herders. Of all the crops grown in Chad, cotton remains the largest and most profitable. The cotton industry in Chad employs 2.5 million people and provides around half of Chad's export revenue (Culture of Chad).

In 1960, Chad gained independence from France and at that time declared free compulsory education at the primary level. Children would begin their education at age six and continue for nine years. Secondary or continued education was limited mostly to boys and was available only in some areas of the country. Although education was compulsory, only about three-quarters of the children in the nation were enrolled. Some towns and villages felt it was less important for girls to attend school as they were learning from their mothers and sisters how to raise children, cook and keep their homes running smoothly. Unfortunately, this was not the only challenge to the education system in Chad (Culture of Chad). In 2009 Chad spent 2.3% of the national income on education which is simply not adequate to maintain schools. With the education system lacking appropriate funding families would often be asked to contribute money in order to pay for teacher salaries. Many families could not afford this and thus did not send their children to school for lack of an ability to contribute financially. Many schools are understaffed and sometimes have as many as 100 students to each teacher for some lessons. Also due to inadequate funding, schools are poorly equipped, many without running water, electricity or basic school supplies. Lamentably, the lack of importance placed on education for girls and the lack of funding, has led to 40% illiteracy rate among women in Chad. It is unfortunate, but there are so many basic survival issues facing families in Chad that receiving a formal education is likely not a huge priority until many other issues including the economy, food and clean water are addressed and resolved. As the old adage goes, "Which came first the chicken or the egg?" Addressing the education system would help educate children in hopes of them becoming a marketable tradesperson in the Chadian community. This would increase their earning potential, their ability to contribute to the economy and educate others on how to improve agriculture and healthcare. Yet, how do they get to that point without proper nourishment, clean water, adequate healthcare and safe living conditions (SOS Children)?

The healthcare system in Chad is in much the same condition as the education system. It is underfunded, understaffed and under-prioritized. Per 1000 people in Chad, there is only one qualified healthcare worker and that is typically a nurse or the equivalent of a paramedic. Most citizens of Chad who have actually received medical care by a licensed medical doctor received it through the graces of outside aid or mission groups such as "Doctors without Borders" or the "World Health Organization." Malnutrition is responsible for more than half of the deaths in children under 5 years old. A major contributor to this is also lack of preventative, primary and prenatal healthcare in the nation. Medical facilities are few and

most lack proper medical supplies, clean water, sanitary conditions and medications used to treat common ailments such as antibiotics and pain killers (Countries).

Perhaps one of the the biggest challenges facing the people of Chad is the vicious cycle that seems to enslave the agricultural families in the southern region. The cycle consists of inadequate nutrition, and sanitary living conditions based largely on lack of clean water supplies and scarcity of food available to families. The harvest reaped by individual families is frequently quite plentiful, especially during the rainy season. However, these families must sell nearly all of their harvest at market to make up for the debt they incurred during the dry season, leaving very little for the family to consume. When the crops are plentiful they are forced to sell their harvest at very low market prices thus gaining very little financial surplus to sustain them through the next dry season. This forces the family back in the debt and malnourished conditions from which they came. At first glance this problem seems largely economic, but if the supply of clean potable water was more abundant they could rely on this not only for themselves but for their livestock, working farm animals, and crop irrigation, which would in turn assure a plentiful harvest more often (Culture of Chad).

Another issues facing the people of Chad is employment and the economy. Oil reserves were discovered in Chad in 2003. This discovery led to new construction and infrastructure projects like the building of new roads. Naturally one would assume that the development of a new industry, particularly the oil industry, would be wonderful news for a struggling nation such as Chad. Unfortunately, the oil wealth only benefitted a small section of chad's society and most Chadians continue farming as their livelihood. The average minimum wage of a Chadian citizen, whether working in an urban or rural area, is approximately \$51 per month, which is a stark contrast from the approximately \$1250 per month the American minimum wage worker earns. Granted, the cost of living differs greatly from Chad to the United States but the United States does not have the same type of extreme poverty and substandard living conditions that exist in so much of the nation of Chad (Culture of Chad).

All of the aforementioned factors have at least one common denominator: each have some connection to the lack of safe, clean water for nearly half of the citizens of Chad. The lack of clean water affects the primarily agrarian society because farmers do not have safe water in which to care for their livestock and irrigate their crops. Since farmers do not have the ability to irrigate their crops their yield may not be sufficient to earn a decent living for their family. Lack of economic means for a family means lack of ability to purchase nutritious food to feed their growing families (Culture of Chad). This water crisis is further exacerbated by the extreme climate and unpredictable weather conditions facing Chad. Rising water temperatures in the Gulf of Guinea have shifted the flow of rainclouds further southward, causing a larger dry, desert-like area in the northern region of Chad. This makes it even more difficult for the nomadic farmers of the region to obtain water. Even with devices and techniques to purify and sanitize the water that exists, if a farmer of a family has to travel long distances to find water this can be very detrimental to their industry and their health (SOS Children). Lastly, Lake Chad, once the third-largest source of fresh water in Africa, is disappearing according to new satellite images and survey reports. This is putting millions of people in four central African countries, including Chad, at risk of losing their primary water supply. The lake is shallow and has a large surface area. Forty years ago the lake was approximately the same size as Lake Erie. The lake is now one-twentieth its previous size. The region surrounding the basin continues to suffer from long, intense droughts and the shrinking of Lake Chad is cutting off the primary water supply to millions (Pope).

The condition of the clean water crisis in Chad is not as severe as it was five or six years before outside groups began building solar powered wells. However, it is still severe enough that approximately 50% of families do not have access to clean potable water. If the entire population of Chad has access to safe, clean water for drinking, cooking, bathing and caring for their crops and animals, the amount of quality food would increase and the economy would improve because farmers would be able to provide irrigation

to their crops, even in the dry seasons. All this pointing back to one single issue: safe, clean water (Hubbard).

In order to establish safe, clean water sources in all regions of Chad there are many steps that need to be taken. The first and perhaps the most permanent solution is to channel foreign and domestic funds designated for clean water to the cost involved in building solar powered wells in the same way UNICEF has done for many regions surrounding N'Djamena (Hubbard). In addition to wells being built, there are a few smaller, less expensive technologies that can be utilized by individuals and villages to improve their own personal health. There is a company called "LifeStraw" and it manufactures a small device called a personal filter straw which allows a person to drink water from literally any source (except saltwater) and have the harmful impurities filtered out of it. These individual units sell for approximately \$20 per straw and should be provided to all citizens of Chad who are living in the communities where wells or other safe water sources have yet to be installed (Samo). There are two organizations under the umbrella of the United Nations that could feasibly be tapped into to help incur the cost of supplying such a device to all citizens living in areas without clean drinking water. The first of these organizations is called "UN-Habitat" and it stands for The United Nations Human Settlement Program and is designed to promote socially and environmentally sustainable human settlements for all. The other UN based non-profit organization that may have financial resources available for such a purchase is UNEP, The United Nations Environment Program. UNEP, established in 1972, is the voice for the environment within the United Nations system. UNEP acts as an advocate and facilitator to promote the wise use and sustainable development of the global environment (United Nations).

Another major concern is the previously mentioned issue of the significant reduction in size of Lake Chad, a water source that once helped the population thrive. Jonathon Foley and Michael Coe of the University of Wisconsin have studied this situation and found the diminished state of Lake Chad is a combination of factors including drought and human use but also recognizes the need for a thriving water source that was once Lake Chad. Foley and Coe published a paper in the *Journal of Geophysical Research* and concluded the diminished state of the lake has caused populations to depend more and more on the rivers flowing into this basin. Now that people understand fresh water is a precious resource and needs to be treated as such, the fear is these rivers will one day not be able to supply the needs of the vast numbers of fishermen, farmers and herdsman that rely upon it. At one point it was suggested the Congo River be diverted so some water flows into Lake Chari which in turn flows into Lake Chad. This would be an expensive solution with a lot of labor involved, but would probably prove the most efficacious as far as restoring Lake Chad to a larger body of water. The most obvious concern with this potential solution for restoring a major body of water is cost and who would incur this cost. Obviously the government of Chad is in no position to tackle this major financial burden (Pope). Once again there are non-profit agencies under the umbrella of the United Nations that may be able to provide at least partial funding. There is a division of the World Bank called IBRD, International Bank for Reconstruction and Development. The IBRD was created in 1944 to help rebuild Europe after World War II. IBRD provides a combination of financial resources, knowledge and technical services to developing countries. Another possibility from the UN is the UNDP, United Nations Development Program. It works in 170 countries and territories, fighting poverty, inequalities and helping developing nations become sustainable. Other possible funding sources would be religious mission and charities. After all, a majority of Chadians are either Christian or Islam. Lifewater International, Living Water and the Water Project are all religious based organizations that provide aid to countries with a water crisis. A combined financial and labor effort on the part of a few or many organizations like these would help make it possible to re-route the Congo River to revitalize Lake Chad (United Nations).

In addressing the water need for crop irrigation and safe water for livestock and other farm animals a two-fold solution may be possible until a more permanent well or other water source is implemented. Rainwater harvesting is a practice that has been utilized for hundreds of years. It is the simple practice of

channeling rainwater from surfaces and storing it. This combined with the use of solar stills would provide a lot of relief for struggling farmers in both the north and south. A solar still has the capacity to desalinate and decontaminate water. It's a relatively simple solution that involves using the power of the sun to distill water in order to generate potable, clean water. It was originally developed for military and survivalist usage where holes were dug into the ground and covered with a sheet of plastic.

Aquamante is a company that makes small solar still that come in portable packages and can distill water from a variety of sources. In conditions of adequate sunlight, which is not an issue in Chad as they are very near the equator, the Aquamante solar stills can produce two liters of clean water a day. Once a more permanent solution such as a well is implemented, the rainwater harvest and the solar still could remain in use to supplement farmers and their families during the unforgiving drought seasons (Samo). Once again funding would be a primary concern for this solution. One possibility would be to tap into resources designated for refugees. Chad is currently home to approximately 400,000 refugees. Some are originating from Sudan and Central African Republic, while some are native Chadians returning after being driven out many years earlier by violence generated by Boko Haram. This is a significant refugee population and it is most certainly taxing an already struggling nation in terms of food, water and other resources. Organizations that are equipped to provide financial assistance to countries who are home to large numbers of refugees are Church World Service, Lutheran Immigration and Refugee Service, International Federation of Red Cross and Refugees International (United Nations).

In conclusion, Chad is an extremely poor, developing nation in central Africa that can attribute many food insecurities and meager healthcare options to the lack of clean, potable water for approximately 50% of its population. Chad is ranked in the bottom 25% in the world for food availability, safety and affordability. This statistic is no doubt also related to the availability of clean water for consumption, livestock and irrigation (Chad). Throughout the past decade, progress has been made with resources provided by UNICEF and USAID with the building of solar powered wells. In order for this nation to continue to develop into a sustainable country with a clean reliable water source these efforts must continue. In addition to the continued progress in well construction all Chadian citizens, including the 400,000 refugees that now call Chad home, need to be provided with the technology of a LifeStraw for safe water consumption (SOS Children). In addition farmers and herders need to be provided with means to harvest rainwater and purify existing water supplies to safely care for their livestock and crops. Unlike many natural resources, water is a natural resources that can be taken for granted because human life will cease to exist without it. Here in the United States clean water is not a daily consideration. We live our lives drinking water, bathing, preparing food, feeding our children and animals, watering our gardens, brushing our teeth and washing our dishes and clothes all without giving it a second thought. Imagine for just a minute none of those things could happen without the possibility of suffering serious illness or even death. It is not a reality that most of us are prepared to face and yet citizens in Chad along with numerous other nations across the globe have to face it every day of their lives.

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