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 Central African Republic Factor 9: Water and Sanitation

### **Central African Republic: Better Water, Better Life**

It is important to remember the survival rules of three. Humans can survive three minutes without air, three hours in harsh conditions such as extreme heat, three days without water and three weeks without food. These four things are necessary for human survival. Here in the United States, many people take these things for granted and may not consider that globally many people have no shelter for harsh conditions, no masks for the dirty air, no filter for contaminated water and no help for a limited food supply. While most countries have the basics required for survival, other countries - such as Central African Republic - are not so fortunate.

Central African Republic (CAR) is located in the center of Africa and is home to 5,065,175 people (“Central African Republic Population (LIVE)”). CAR has been suffering from internal conflict, poaching issues, and poverty. Among their many challenges, the lack of clean water is perhaps the most troubling. In CAR, people have access to water, but it is heavily contaminated and unfiltered, putting people at risk for Cholera, Diarrhea, E Coli, and even death. This has resulted in a very high infant mortality rate and low life expectancy. Though clean water projects have helped, much more must be done.

### **Central African Republic**

CAR gained their independence from France in 1960. The country was formerly known as Oubangui-Chari and was part of French Equatorial Africa (“Central African Republic- Everyculture”). The official language spoken in CAR is French, however there are some tribal languages still spoken in remote areas (“Central African Republic-Worldmark”). There are 17 different districts in CAR and each one has its own capital. There are two economic jurisdictions and fourteen administrative jurisdictions. There is also one autonomous commune which is the capital of CAR, Bangui (“Administrative Map of...”).

The climate in CAR is very warm with a rainy season from December to March. There also is a dry and hot season from April to November. Ever since 2005, the rainy season has done more damage to homes and crops than in the past. CAR has been slowly growing by approximately 2.01% since 1950. The population is projected to start declining in the year 2020 (“Central African Republic Population (LIVE)”). Overall, CAR has a very young population, in 2005 only 4% of the population was over 65 years old while 43% was under the age of 15 (“Central African Republic-Worldmark”).

The typical family is very large and is mostly made up of children. They usually live together in one house that includes grandparents, brothers, and sisters. Some families may be larger because men are legally allowed to have more than one wife. Each wife lives in and manages her own home. The woman's role is to raise children and provide food, so this typically means growing the crops and preparing meals. Many of their dishes focus on peanuts, fried sweet potatoes, boiled eggs, fish, and fruit with pumpkin seeds. When families gather to eat dinner, they eat on the floor with a small table or they eat very low to the floor on stools. Men and boys eat together, while young girls eat with their mothers near the fire where the meal is being cooked. It is impolite for children to talk during the meal or eat large portions of meat. A child's role in the family is to help out with certain tasks around the household and go to school (“Central African Republic - Culturegrams”). While women mainly work in the home, men provide money and schooling for the children.

The education system in CAR is very similar to the one in France. There are four “levels” in the school system: nursery, primary, secondary, and finally tertiary. Kids are tested at the end of their five-year primary school. If they pass then they continue on to secondary school (“Education system in...”). Along with providing schooling for the children the men and very few women also work in agriculture, which provides about half of CAR’s general domestic product and employs about 85% of the work force. Crops grown in CAR include manioc, corn, millet, bananas and rice. These foods are grown on low-technology farms which means that the farms operate under minimal modern day technologies. Some of CAR’s main export crops are tobacco, timber, and cotton. Mining of diamonds is also a major source of income for CAR. Diamonds were discovered in 1935 and have been a major export item ever since (“Central African Republic - Culturegrams”).

Throughout the country, except in the capital of Bangui, people have trouble getting health care. Approximately 16% of children under the age of five are not getting enough food and are malnourished. There are about 25 therapeutic feeding centers, which focus on getting help to the malnourished children and adults in the area. This contributes to the high infant mortality rate. When there is little access to healthcare many children under the age of five die due to very treatable diseases. Among the very few healthcare centers CAR has, many of them have been looted or are not operational (N’dele). CAR’s poor access to health care contributes to their problems, and when coupled with the lack of clean water for many people, leads to CAR’s very low life expectancy rate of 52.5 (“Life Expectancy in...”).

### **The Challenge of Clean Water**

Of the many challenges CAR faces the water situation is perhaps the greatest. Ever since CAR gained its independence, the standard of living has regressed to one of the lowest levels in the world. Like many countries in Africa, poverty is also another prying issue in the CAR government. According to The Water Project organization, “There are a number of reasons why poverty has become an epidemic in Africa. Poverty can be the result of political instability, ethnic conflicts, climate change and other man-made causes” (“Poverty and Water”). These factors, combined with the instability of an immature government, can be detrimental to an economy. The Water Project goes on to say, “One of the greatest causes of poverty in Africa is also the most overlooked... the lack of access to clean drinking water” (“Poverty and Water”). Water is crucial to life. About 60 percent of the human body is made up of water; it is found in every single organ and cell. It is essential to have access to clean drinking water.

However, the current civil unrest in CAR makes it difficult to gain access to drinking water. In 2013 the situation that started in CAR could be summed up as being in a state of anarchy, which by definition means “a state of lawlessness or political disorder due to the absence of governmental authority” (“Anarchy.”). A rebel group, Séléka, which translates into “Alliance,” had seized power and taken over the government. A second group, the Anti-Balaka or “Anti-Machete,” fought with Séléka and together they have terrorized civilians in their conquest for control. Many people had fled their homes in fear of genocide. It was not until external governments intervened in 2014 that CAR was returned to a transitional government. (“Central African Republic Country Profile”). With CAR working on returning to a stable government, and new conflicts breaking out all over the country, the young government and peacekeepers from other countries have many challenges to overcome; providing clean drinking water to it’s citizens is just one of them.

The problem is not about the access to water; like many countries in Africa CAR citizens have lots of water available. The problem is that the water is not safe for drinking and for domestic use. Due to recent events many people have been left living in camps and bushes. CAR citizens have resorted to using raw water, but doing so can significantly increase their chances of getting a waterborne disease. Diarrheal-related diseases are among the main water-born diseases affecting children and adults in CAR. According to the United Nations International Children's Emergency Fund (UNICEF) “Diarrhoea is caused by a

variety of microorganisms including viruses, bacteria and protozoans. Diarrhoea causes a person to lose both water and electrolytes, which leads to dehydration, and in some cases death. Diarrhoea is the most important public health problem directly related to water and sanitation” (“Water, Sanitation and...”). There are many other water-borne diseases that affect the developing country’s health. An outbreak of cholera, an acute diarrheal disease, recently happened in August 2016, in CAR. The first signs of outbreak started in Djoukou, in the Kemo district, which is located approximately 100 kilometers up the river from the capital. Civilians in this area have little to no access to clean water so they are left to use the river, Oubangui, as their main source. There is nothing to decontaminate the water, therefore it leaves citizens at risk for diarrheal diseases (“UNICEF and Partners...”).

A global burden diseases study was done in 1990 and again in 2005-2015. The study provided information on the diseases that have been causing premature deaths in CAR. Between the two studies, Diarrheal Diseases has remained in the top 5 causes for the past 15 years. According to the study in 1990, the Diarrheal Diseases was the number one cause of premature deaths at 383 (13.6%) (“GDB Profile: Central...”). In 2005-2015 Diarrheal Diseases dropped to number four. The three diseases that are currently ahead of it are malaria, HIV/AIDS, and respiratory infection (“Central African Republic”). Diarrheal disease is decreasing its impact on the world slowly every year, in 1980 the amount of deaths caused by Diarrheal infection worldwide was around around 4.6 million and in 1919 it dropped to 3.3 million and in 2000 it had gone down to 2.5 million. However, even with the advances in technology and the changes in management of countries, the morbidity of diarrheal disease still remains in the top 5 of child mortality (Boschi-Pinto).

Clean water can not be taken for granted. Water has always been important and is one of the main contributors to life. Countries and communities have recognized this for hundreds of thousands of years. Water wells have been found in northern Israel dating all the way back to 8500 BC. Water lies in the middle of everything. It is used to grow crops, people drink it, cook with it, and clean themselves with it. The only way for a country to continue growing and to continue contributing to their community is if they have a good clean water supply and currently CAR does not have that.

### **Ceramic Water Filters**

Given the critical importance of clean water CAR needs to have a solution that could easily and economically decontaminate the water. There are many different types of water purification methods used in helping developing countries clean their water. Some include Life Sack, a water purification method, designed as a backpack, that uses solar energy to decontaminate water and destroy any harmful bacteria. It also doubles as a backpack that could be used to transfer goods (Lim). A second example is the Eliodomestico, which is a pot that also uses solar energy to remove any toxic bacteria. It is made of terracotta and purifies about 5 liters of water per day (Resnick). Another includes the LifeStraw. The Lifestraw was introduced in 1994 and is a small tube designed to eliminate any harmful microorganisms and bacteria by putting the straw into the water and drinking through it (“Our Story”).

While many of these ideas are acceptable and would provide clean water, they either produce water very slowly, need to be replaced frequently or they are mostly designed for individual usage. However, a Ceramic Water Filter could be the answer. A Ceramic Water Filter is a pot that is 11 inches wide and 10 inches deep. It is made with local terra-cotta clay and sawdust or it could be made of other combustible materials, such as rice husks. This pot is used to filter water. When water is put into the filter it can filter 1.5 to 2.5 liters per hour (“Ceramic Water Filter” Ceramic Water Filter).

Making a clay pot is not difficult. First it is formed with locally found materials and then fired at about 860 degrees. After the pot has settled it is coated with colloidal silver. It is then tested to fit the standards of the filter to make sure it will filter correctly. When the fine pore size of the pot and colloidal silver are put together it creates an effective filter. The price of the filter itself is based on the community and the

production line owners. If CAR is introduced to these pots, they will be able to start their own production line and it would also create jobs. If the knowledge of these pots spreads there can be many production lines throughout the country. One way to introduce these pots to CAR is through an organization called Potters for Peace (PFP).

PFP is an organization helping people in different countries understand how to build Ceramic Water Filters and learn to set up a production line for themselves. The goal of PFP is “To make bacterially contaminated water safe for the poorest of the poor by developing a low-cost filter that could be fabricated at the community level” (Potters for Peace Staff). The design PFP uses for the filters was developed in 1998 by Dr. Fernando Mazariegos of the Central American Industrial Research Institute (ICAITI) in Guatemala. PFP started working to help in Nicaragua using the Mazariegos’ design after a devastating hurricane ripped through Central America. The organization was able to help set up a ceramic filter production workshop and within six months around 5000 filters were distributed and the workshop evolved into a worker-owned cooperative and now is a privately owned business. The way PFP works is they recommend to send a group in for a one week site assessment and then a group would stay for a five-week consultancy to train factory employees to get the filter production started.

PFP has worked in many countries such as Cambodia, Bangladesh, Ghana, Sudan, Nigeria, Tanzania, Peru, Somaliland and more (Potters for Peace Staff). Many other countries have used Ceramic Water Filters and the impact of them has been tremendous. Ever since 2003 Cambodia has been producing Ceramic Filters. According to Resource Development International of Cambodia “Ceramic water filters have proven to be tremendously effective in reducing the exposure of users to contaminated water, and the incidence diarrhea over an extended period of time” (“Ceramic Water Filters”). Since water filters have been introduced, diarrheal disease has dropped by 50 percent. This was a huge change for Cambodia. If these water filters were implemented in CAR, there would be similar effects (“Ceramic Water Filters Win...”).

Another country the filters have worked in is Uganda. Before Uganda started using the filters about 30% of Uganda did not have access to clean water. About 60% were reliant on boiling water. According to Entrepreneurial Solutions for Resilience in Water Management, “In 2015, its first year of sales, the company sold 3,800 filters, bringing clean drinking water to more than 44,000 people. In the first 8 months of 2016, it sold more than 3,000 filters, with demand exceeding supply” (“Local Production and...”). After they were introduced to Uganda the filters were immediately bought and used. Many other countries have also tried and succeeded with the use of Ceramic Water Filters.

While the water filter is a very viable solution, there are some challenges that need to be overcome. One of the challenges is the initial cost that CAR would need to come up with to start a filter production line. An email from PFP states that they recommend around \$12,000 to \$30,000 minimum to start the production line. This does not include money for the land or the building. This money could come through different organizations such as: GlobalGiving, The International Monetary Fund, The Water Project, The World Bank and UNICEF. In past years UNICEF has done work in Cambodia with Ceramic Water Filters. They partnered with a local non-governmental organization and created The Happy Family Water System (Linn). Furthermore the GlobalGiving organization has raised money to start Ceramic Water Filter production lines in Cambodia (“Ceramic Water Purifier...”).

While PFP originally wanted to train people how to hand make the filters without any electricity the organization has found that it is better to start with enough money to pay for electrically powered equipment, such as a mixer and pug mill. It is for this reason that the initial startup cost is high. PFP also says that the quality of the pots is essential for good quality and a durable pot. Once the costs are paid the assembly line would be able to carry on by themselves. The \$30,000 is a one time cost and the lasting effects of the pots would overshadow the initial cost as the business becomes self-sustaining. After the

production line is up and running, the community decides how much a pot should cost. According to PFP, many jobs can be provided with these production lines, as they can employ anywhere from 5 to 60 employees for each production line (Wagoner). As long as there is a person operating the line and working with other people to keep the production line going, the production of Ceramic Water Filter can continue for many years. Overall, the positive effect of these filters will outweigh the challenges in getting started.

### **Where to Begin**

There are many places that the first Ceramic Water Filter production line could be set up. However, due to the continuing conflicts in CAR, safe places have become scarce (“Spreading Violence in...”). This does not mean, though, that the country should be neglectful of clean water. Without access to clean water the people of CAR can not effectively manage their conflicts if they are unhealthy and are struggling to survive.

Now, the major question is: where to begin? Many of the districts that make up CAR are actively dealing with continuous conflict, which makes new ventures difficult. The first production company should be placed in a populated area with an available workforce. The most populated place currently in CAR is their capital, Bangui (“Central African Republic Facts”). However, due to recent fighting Bangui would not be a safe place to introduce a new production line. One of the nearest available districts that has a lesser amount of fighting is the city of Sibut in the Kemo district, which has a population of 148,875 as of 2014 (“Integrated Safeguards Data...”). The need for the filters are great in Sibut and in the Kemo district. It is also in close proximity to the capital. For these reasons, Sibut would be a reasonable place to build the starting line.

### **Conclusion**

Central African Republic has many problems, including poverty, conflict, and disease. The most important is by far the poor water supply. Without drinkable water people in CAR are not able to achieve their full potential and contribute to their community. If people are always worried about their health, they can not maintain a healthy lifestyle. While CAR has lakes and rivers near them the water they have is very contaminated and undrinkable. Though there are many possible solutions to improve this situation, the production of Ceramic Water Filters is perhaps the most efficient and effective. Taking advantage of this solution would provide clean water to many and also create jobs, thus helping to strengthen CAR’s struggling economy.

People in developing countries are not any less important than the ones in developed nations, especially if they are in a crisis. Every effort must be made to assist countries such as CAR. Building Ceramic Water Filter production sites is a sustainable solution to help address their needs. The survival rules of three apply to everyone in the world, and we must support such practical and innovative solutions to ensure people have what they need to thrive.

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